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Campus Map, inside back cover
Utah State University

Utah's State-wide University

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

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

USU includes eight resident colleges with nearly fifty departments, a school of graduate studies, extension services, research programs, and one branch college: Snow College at Ephraim. It participates in educational aid to several foreign countries.

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

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

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: J. W. Sanborn, 1890; J. H. Paul, 1894; J. M. Tanner, 1896; W. J. Kerr, 1900; John A. Widtsoe, 1907; E. G. Peterson, 1916; Franklin S. Harris, 1945; Louis L. Madsen, 1950; and Henry Aldous Dixon, 1953.
Calendar

Summer Quarter, 1965 — June 14 to August 20

June 14, 1965, Monday
July 16, 1965, Friday
July 19, 1965, Monday
August 20, 1965, Friday

Registration.
End of First Session
Registration, Second Session
End of Summer Quarter

Fall Quarter, 1965-66

September 13, Monday
September 22, Wednesday

September 23, Thursday
September 24, Friday
September 25, Saturday
September 27, Monday
December 10, Friday
December 13, 14, 15, 16
(Monday, Tuesday, Wednesday, Thursday)

Faculty Meeting
Testing for entering freshmen and foreign students English placement
Orientation
New student registration
Former student registration
Classwork begins
Classwork ends
Final Examinations

Winter Quarter, 1965-66

January 3, 1966, Monday
January 4, Tuesday
January 5, Wednesday
March 11, Friday
March 14, 15, 16, 17
(Monday, Tuesday, Wednesday, Thursday)

Registration 8:00 a.m.
Registration
Classwork begins
Classwork ends
Final Examinations

Spring Quarter, 1965-66

March 21, 1966, Monday
March 22, Tuesday
March 23, Wednesday
May 27, Friday
May 30, Monday
May 31, June 1, 2, 3
(Tuesday, Wednesday, Thursday, Friday)
June 4, Saturday

Registration 8:00 a.m.
Registration
Classwork begins
Classwork ends
Memorial Day Holiday
Final Examinations
Commencement

Summer Quarter, 1966 — June 13 to August 19

June 13, 1966, Monday
June 14, Tuesday
July 15, Friday
July 18, Monday
August 19, Friday

Registration
Classwork begins
First Session ends
Registration—Second Session
Summer Quarter ends


Tuition and Other Fees

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

Fees Per Quarter

<table>
<thead>
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<th>Fall, Winter and Spring Quarters</th>
<th>Resident Students</th>
<th>Non-Resident Students</th>
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<tr>
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<td>Total Fees</td>
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<td>$167</td>
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</tbody>
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Special Fees

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

Excess Registration Fee: For each excess hour (except two hours of Military Science, 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 per year.

Out-of-State Student Auto Permit: 50¢

LATE REGISTRATION FEE: $5 beginning second day after specified Registration Days: additional $1 for each additional day up to a maximum of $10.

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

Change in Course of Study List: No charge for the first week of the Quarter. $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 $6 per credit hour (maximum 6 credits)

Visitor Fee—Registration as listener or visitor in lecture course only in which no credit is desired, per quarter, per subject $10.00

Special Examination Fee—Per Credit Hour $4.00

Qualifying Examination—Graduate School

1 Part 3.50

2 Parts 5.50

Graduation Fee 5.00

Late fee of $2.00 effective after January 15.

Student Teaching Fee 25.00

Teacher Placement re-registration 5.00

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

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

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 course per quarter.

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

College of Forest, Range, and Wildlife Management—

Senior Field problems:

Forestry 146 35.00

Range Management 196 30.00

Wildlife Management 171 35.00

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

Military Uniform Fee 5.00

Music—Individual Instruction with members of the College Staff:

One lesson per week (10 lessons) per Quarter (1 credit) 30.00

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

Individual instruction with additional authorized teachers is registered for at the college and given like credit, but paid for by private arrangement with the teacher concerned.
Practice Fees:
Practice Room with Piano, 1 hour per day per Quarter 2.50
Practice Room without Piano, 1 hour per day per Quarter 1.75
Organ, 1 hour per day per quarter 5.00
Speech—The fee for Speech 112 is $20 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are: Burrell F. Hansen, Floyd T. Morgan, Chester J. Myers, Gwendella Thornley.
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. After a student has paid a total of $30.00 in Alumni fees he becomes a Life Member of the USU Alumni Association. Graduate Students or students attending more than 12 quarters, and who have been assessed more than the $30 in Alumni fees, may receive a refund of the excess amount upon sending a written request to the USU Alumni Association within 30 days from the registration day of the quarter in which the additional money was paid.
According to the constitution of the Associated Students, a regularly enrolled student must obtain, at time of registration, a Student Body card which will admit him to all activities controlled by the Associated Students: athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc.; will give him a copy of the yearbook if student body fee was paid for all quarters, and a subscription to the University newspaper. The system has been found to be a great saving to the students and an excellent means of fostering proper interest in student activities.
Information on Scholarships, Fellowships, and Assistantships can be found in the section on Student Services and Activities in this Catalog.
(For Housing fees see the section on Student Services and Activities.)
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Ellvert H. Himes, Director, Summer Quarter
LeRoy A. Blaser, Director, Public Services and Information
Frank Williams, Director, Athletics
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<thead>
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<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 230</td>
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<td>Agricultural Education</td>
<td>Stanley S. Richardson</td>
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<td>Agricultural and Irrigation</td>
<td>A. Alvin Bishop</td>
<td>Engineering L-272</td>
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<td>Engineering</td>
<td>David A. Mayo, Jr.</td>
<td>MS 107</td>
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<td>Air Science</td>
<td>James A. Bennett</td>
<td>Animal Ind. 307</td>
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<td>Animal Science</td>
<td>Rex L. Hurst</td>
<td>Main 14</td>
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<tr>
<td>Applied Statistics and</td>
<td>W. Whitney Smith</td>
<td>Plant Ind. 310</td>
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<td>Computer Science</td>
<td>Orson S. Cannon</td>
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<td>Botany</td>
<td>Donald W. Dobler</td>
<td>Main 153A</td>
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<tr>
<td>Business Administration</td>
<td>Robert E. Wiper</td>
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<td>Business Education and</td>
<td>Melvin C. Cannon</td>
<td>Widtsoe 112</td>
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<td>Irving Dunn (acting)</td>
<td>Engineering L-162</td>
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<tr>
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<td>Norma H. Compton</td>
<td>Family Life 303A</td>
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<td>Civil Engineering</td>
<td>George E. Stoddard</td>
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<td>Clothing and Textiles</td>
<td>Evan B. Murray</td>
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<td>Dairy Science</td>
<td>Homer M. Johnson (acting)</td>
<td>Education 206C</td>
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<tr>
<td>Economics</td>
<td>Larry S. Cole</td>
<td>Engineering L-150</td>
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<td>E. Malcolm Allred (acting)</td>
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<td>Electrical Engineering</td>
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<td>Don C. Carter</td>
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<td>Ethelwyn B. Wilcox</td>
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<td>Food and Nutrition</td>
<td>J. Stewart Williams</td>
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<td>Forest Management</td>
<td>H. B. Hunsaker</td>
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<td>Geology</td>
<td>J. Duncan Brite</td>
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<td>Health, Physical Education and</td>
<td>Edith Nyman</td>
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<td>Recreation</td>
<td>Carl R. Bartel</td>
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<td>Reynold K. Watkins</td>
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<td>Twain Tippetts (acting)</td>
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<td>Merthyr L. Miner</td>
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Explanation of
Catalog Numbering System:
Courses, Quarters, Credits

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

Most classes give either one, two, three, four or five credits for successful completion of the course. 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, Sp, Su) indicates that the course offers five credits and will likely be taught all four quarters: Fall, Winter, Spring, and Summer. It does not mean that a student has to take the class all four quarters, but rather
that he has his choice of any quarter. In some cases, such as (5F, W, Sp) even though more than one quarter is indicated, the course will not be given each quarter, but only one of these quarters, the exact one yet to be decided.

For more definite, up-to-date information, one should refer to the Class Schedule published early in the fall. It contains the schedule for the fall, winter, and spring quarters.

All catalog listings are subject to change.

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

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

In some classes the amount of credit for which students register can be individually arranged. One student may take two 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 except for a thesis course or unless otherwise specified.

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

The University Library with its new greatly expanded quarters and staff maintains programs consistent with the growth and increased demands of the faculty and student-body. The organization of the library system is as follows:

(I) Divisional Libraries.

(a) Science and Engineering. This division houses both the journal and book collections to serve the Colleges of Science; Engineering; Forest, Range and Wildlife Management; Agriculture, and some of the materials of the College of Family Life.

(b) Social Science and Education. This division houses the journal and book collections to serve the College of Business and Social Science and the College of Education with the remainder of the materials to serve the College of Family Life.

(c) Humanities and Arts. This division houses the journal and book collections to serve the College of Humanities and Arts.

(d) U. S. Public Documents. This division is a regional depository for U.S. Government publications.

(e) Special Collections. This division houses the Library's Collections of rare and unusual books, manuscripts, and University archives which serve scholars in all areas of the University. It also administers the Hatch Memorial Library.

(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.

(e) Curriculum Library, A special collection of text books and guides for the public schools, which includes both elementary and secondary school materials.

(III) Resources of the Library include:

(a) Approximately 400,000 volumes; (b) 3,000 periodical subscriptions; (c) Regional Depository for United States Government documents; (d) Selective depository for United Nations publications; (e) Exchange holdings of state, territorial, and foreign documents; (f) A
growing collection of documentary micro-films and micro-cards.

(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 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 any field and the courses may be used to meet the Library requirements of the Northwest Association of Secondary and Higher Schools.

Man and His Bread Museum

The history of agriculture is in many ways the history of mankind. The purpose of Man and His Bread Museum is to tell the story of agriculture, and the effect that changes in agricultural technology have had on man.

The exhibit area of the museum is located in the basement of the new part of the library. In this area there are exhibits dealing with the harvesting and threshing of wheat, the sources of farm power, the evolution of the plow, and the development of wheat varieties. There is also a series of special exhibits dealing with a wide variety of agricultural subjects. These exhibits will change several times a year.

In addition to the exhibits the museum maintains a storage and shop area where additional equipment is reconditioned and stored for future exhibits. Other activities of the museum include: an index of farm equipment manufacturers, a file of company literature, and a picture file of old and new equipment and methods.

The museum is open to students and the general public from 8 a.m. to 5 p.m., Monday through Saturday. For classes and other groups the museum has a guide and education service to help them understand the exhibits better and to provide additional information about the history of agriculture.
ADMISSIONS AND RECORDS
Office of
Admissions and Records

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Office of

Admissions and Records

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

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

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

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

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

(4) University Records 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.

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.

Testing. All freshmen, including transfer students with less than 45 quarter hours of credit, and all other transfer students who have not completed one full year of freshman English must have on file with the Counseling and Testing Services the results of the American College Testing Program Examination (ACT) at the time they apply for admission. (College Entrance Examination Board Scholastic Aptitude Test—CEEB-SAT—will be accepted in lieu of ACT scores).

Transfer students with more than 45 quarter hours of credit but less than 96 hours are required to submit the results of the above mentioned tests or similar tests they may have taken at other collegiate institutions.

Although test scores are not factors considered in admitting students, they are used to assist deans, heads of departments, and advisors in placing students in appropriate class sections, advising them concerning course loads, and in helping them with other similar academic decisions. Therefore, test results must be part of the students' application records before they will be issued permits to register.

Testing dates and general information about the ACT Examination may be obtained from high school counselors or by writing to ACT Central Registration Unit, 519 West Sheridan Road, McHenry, Illinois. Students who are unable to participate in the regular ACT program prior to their arrival on campus will have an opportunity to take the examination before they register. However, registration material is not prepared until students are officially admitted.

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

Graduates of Utah high schools will be admitted to the University if they are entering Utah State directly from high school. Students with grade point averages 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 Admissions Committee and will be accepted or rejected on the basis of approved test scores and other information. Required test scores must be provided by the student.

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

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

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

General Registration. 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 Admissions Committee, enroll in the General Registration Unit of the Counseling Service. (See "Low Scholarship and Probation")

Acceptance by the Office of Admissions and Records does not automatically guarantee housing accommodations. Application for University housing should be made to the Student Housing Office, Main 105, or, in the case of LDS accommodations, to David O. McKay Student Living Center, 10th North and 13th East, Logan.

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

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

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

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

Transfers from other Colleges. The University does not grant collegiate credit for high school work in excess of graduation requirements. Transcripts of credit must accompany applications for admission when submitted by students who have attended other collegiate institutions. Transcripts submitted for evaluation become the property of the University, and are not returned. A student who fails to submit transcripts from all institutions, previously attended, is liable to suspension from the University.

Credit will be granted for work 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.

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

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 2.2 or better. Students who have a cumulative grade-point average between 2.0 and 2.2 will be referred to the dean of the college of his choice for admission to that college. If unacceptable to the dean of the college, such students will be admitted to general registration if they have earned fewer than 135 quarter hours of credit. Exceptions may be made by the Admissions Committee. ACT test scores, the recommendations of Counselors, and the student's experience in non-academic pursuits will be considered. Students who have a grade point average below 2.0 will be admitted only upon recommendation of the Admissions Committee.
All subjects taken, whether in high school or in college, will be considered in determining the eligibility of students applying for admission to Utah State University. The Office of Admissions and Records will establish the grade point in all questionable cases.

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.

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

**Registration.** On each registration day, students are permitted to register according to an alphabetical schedule to be announced later. 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 be-
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Beginning the second day after specified Registration Days; additional $1 for each additional day, up to a maximum of $10.

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

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

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

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.

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 may 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.

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

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

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.** The student's adviser and dean of the college in which he is registering must approve his registration regardless of the amount of credit. Whether it should be lower or higher than the so-called “Normal Registration” will depend upon several factors, such as part-time employment, extracurricular activities, the student's capacity or aptitudes, his amount of preparation for specific courses, and his degree of progress or scholastic status. A student is not allowed to register for less credit than that listed for a course in order to bring the total registration within the maximum limit as herein defined. No credit arranged may exceed five credits unless otherwise specified.

The registration is construed to include any extension, correspondence, institute, or other work carried for credit, or for removal of high school deficiencies, during the period of the school year.

**Minimum Registration for a Full-Time Student.** The minimum registration for a full-time student load is considered to be twelve credit hours. To be eligible for studentbody 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. Note: Students who take more than six quarter hours of credit will be charged full fees for the quarter. (See pages 6 and 7 on Special Fees.)

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

**Low Scholarship and Probation.**

If a student has not maintained an average grade of "C" or better, or if he failed to obtain passing grades in twelve or more credits during the preceding quarter, he may be placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the studentbody organization.

A low scholarship student shall be placed on "warned status" at the end of the first quarter in which 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 overall achievement is unsatisfactory. Parents or guardians will be notified of the probational 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 Admissions 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 Admissions Committee. If permitted to register, he may register in the General Registration Unit on probationary status.

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

If a student is admitted on 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.

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

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

Request for permission to take special examinations should be made to the Office of Admissions and Records.
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. Complete 96 credits (quarter hours) of work (including Military Science, Air Science, or Physical Education) with an average of "C" or higher.

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

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

(A) English Requirements

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.

Enrollment for Basic Communications may be waived or deferred by agreement between the student's academic dean and the head of the English Department, if extenuating circumstances exist. Withdrawal from enrollment in a Basic Communications course may be authorized by the same procedure. Special students (those registering for six or fewer credits) need not register for BC. Such waiver or withdrawal does not affect the BC requirements for graduation.

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

(B) Group Requirements

A minimum of 43 credit hours must be completed in general education, including not fewer than 18 hours in the natural sciences—which should include five hours in the biological sciences and five hours in the physical sciences—and 25 hours in the humanities and in social and behavioral sciences. At least 10 hours in Humanities and 10 in the Social and Behavioral Sciences must be included in the total of 25. Departments can require of their major students up to 25 hours credit in any of these three areas: natural sciences, social and behavioral sciences, and humanities.
Courses and conditions for filling group requirements in each of these three areas are as follows:

(1) **Natural Sciences**: Bacteriology, Botany, Chemistry, Geology, Mathematics, Physics, Physiology and Zoology.

At least one course must include a lab. Courses should be taken in both the biological sciences and in the physical or exact sciences. No more than five hours of math can be counted toward fulfillment of the requirement. Courses for filling the natural sciences are: Bacteriology 1, 10, 70, 71; Botany 1, 24, 25; Chemistry 3, 4, 5, 10, 11, 12, 31; Entomology 13; Geology 1, 3, 4, 5, 31; Mathematics 20, 30, 34, 35, 44, 46, 97; Physics 6, 17, 18, 19, 20, 21, 22; Physiology 4; Zoology 1, 3, and 4.

If a student can demonstrate adequate preparation at the level of these courses, permission can be obtained to use more advanced courses, including upper division courses, to fill the science group requirement.

(2) **Social and Behavioral Sciences**: Agricultural Economics, Economics, History, Political Science, Psychology, Social Science, Sociology and Social Work.

Offerings from at least two different departments or academic areas should be represented. Courses for filling the social and behavioral sciences are: Agricultural Economics 71, 72, 73 (not more than three hours to apply); Economics 51, 52, 150, 170, 180; History 1, 2, 3, 4, 5, 20; Political Science 1 or 10, 101, 102; Psychology 53; Social Science 1; Sociology 10 or 70; Anthropology 90.

(3) **Humanities**: English, Family Life, Fine Arts, Horticulture, Landscape Architecture, Language, Speech and Philosophy.

Students must draw from at least two of the following areas, with a maximum of eight hours in any one area:

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

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

**Fine Arts**—(a) **Music**: 1, 101, 102, 103, with the approval of the instructor and department head. A maximum of three hours may be drawn from the following: Music 25, 125, 27, 127, 28, 128, 33, 133, 138, 139. (b) **Theater Arts**: 1, 2, 10; also 100, 102, 104, with the approval of the instructor and department head. (c) **Visual Arts**: 1, 10, 35, 36, 37, 40.

**Horticulture** 118
**Landscape Architecture** 3

**Languages**—(a) Any upper division foreign language course, with the approval of the instructor. (b) A maximum of five hours in any lower division language course.

**Speech**—1, 4, 16, 21, 24, 81, 105; also 110 and 113 with the approval of the instructor and department head.

Additional lower division requirements must be met by students who wish to certify to teach in either the elementary or the secondary schools. These students should refer to the Admission Program listed by each department in the College of Education in this Catalog.

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1Note: For graduation in engineering see College of Engineering section of catalog for recommended social science and humanities courses.
Physical Education or Military

All students under the age of 31 are required to complete three quarters of Physical Education. Men may meet this requirement by taking Military or Air Science. This requirement should be completed by the end of the sixth quarter of residence work.

The requirement must be met by taking:

a. Physical Education 1 (Basic Physical Education).
b. Physical Education 16 or 52 (Elementary Swimming).

Note: Either or both of these requirements may be met by passing waiver tests administered by the Department after which the student may select courses rather than register for the required courses.

c. Selected courses from five activity groups. Only one course from a group may count toward the requirement. Courses, by groups, are as follows:

- Aquatics, Dance, Dual Activities, Individual Activities, Team Activities.

Explanation on Group Classes

Classes used to satisfy the above group requirements are not to be counted toward the major or minor. Departments may prescribe not fewer than 30 and not more than 50 credits in the major subject, exclusive of those used to satisfy group requirements.

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 Freshman orientation requirements as specified under the Lower Division, cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation Requirements

The University offers Certificates of Completion for two years of study in certain departments; the degrees of Bachelor of Arts, Bachelor of Fine Arts, Bachelor of Science, Master of Arts, Master of Fine Arts, 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, and Humanities and Arts offer two-year courses in practical studies leading to a Certificate of Completion for those who are not interested in the regular four-year course leading to the Bachelor's degree.
In most cases the courses are arranged so that, at a later date, the four-year course can be completed with a minimum loss of time. While these short courses are designed to develop a broader understanding of the science underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in both the Lower and Upper Division.

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

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

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

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

(5) Complete 21 credits of elective work.

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

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

Bachelor Degrees

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

Graduates of the Colleges of Agriculture, Forestry, and Engineering are awarded the Bachelor of Science Degree.

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

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

All graduates regardless of the type of degree must satisfy University requirements in General Education groups, in English Composition, and in Physical Education or in Military or Air Science. All students who receive the Bachelor of Arts degree must have completed two years' training or equivalent in a foreign language.

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

Summary of Graduation Requirements

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

(1) All graduates of the state universities of Utah are required to have an understanding of the
fundamentals of the history, principles, form of government, and economic system of the United States. Students may meet this requirement in any one of the following ways: (A) A passing grade in a special examination; (B) A passing grade in the Advanced Placement Examination in American history; (C) The satisfactory completion of a major or minor in Economics, History, Political Science, or American Studies; (D) The satisfactory completion of one of the following courses: (a) History 20, History of American Civilization (5 credits), (b) Political Science 10, American National Government (5 credits), (c) Economics 51, General Economics (5 credits); (E) Transfers evidencing work equivalent to any one of the above.

(2) For women, three 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.

(3) Men must complete three 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.

(4) 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.

(5) Sixty credits of Upper Division work.

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

(7) The completion of the group requirements and of nine hours in Basic Communication or its equivalent.

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

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

(10) Candidates for a Bachelor's degree must complete at least 45 credits in residence at Utah State University, fifteen of which must be included within the last 60 credits presented for the degree. With the approval of the dean of the college from which the student graduates, fifteen credits in courses, approved for this purpose, taken in designated centers may be counted towards the residence requirements for the Bachelor's degree.

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

(11) No more than 108 hours of transfer credit will be accepted to-
ward graduation from junior colleges.

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

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

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

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

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

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

(17) Second Bachelor's Degree. A student who wishes to qualify for a second Bachelor's degree must complete a minimum of 45 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, Agricultural Education, Plant Science, Animal Science, Dairy Science, Soils and Meteorology, 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.
- 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 Agricultural Science Building houses the administrative offices of the College of Agriculture, the Agricultural Experiment Station, and the Extension Services. The Departments of Agricultural Economics, Plant Science, 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 Science and Dairy Science Departments are housed in the Animal Science 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 near future.

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, science, or plant science.

(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, Animal Science, Dairy Science and Plant Science.

(4) **Agricultural Education**, which will prepare the student to become a teacher of agriculture.

Minimum requirements for the BS 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

<table>
<thead>
<tr>
<th>Animal, Plant, or Soil Science</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exact Science</td>
<td>46</td>
</tr>
<tr>
<td>Biological Science</td>
<td>16</td>
</tr>
<tr>
<td>Humanities</td>
<td>10-15</td>
</tr>
<tr>
<td>Social and Behavioral Science</td>
<td>10-15</td>
</tr>
<tr>
<td>Basic Communications</td>
<td></td>
</tr>
<tr>
<td>MS or PE</td>
<td></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, 26; Zoology 3, 4, 112; Bacteriology 70, 71.

3. A minimum of 25 credits required in the two areas—not less than 10 in each.

### Agricultural Business

<table>
<thead>
<tr>
<th>Freshman and Sophomore Years</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exact Science</td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>10</td>
</tr>
<tr>
<td>Social and Behavioral Science</td>
<td>22-27</td>
</tr>
<tr>
<td>Humanities</td>
<td>10</td>
</tr>
<tr>
<td>MS or PE</td>
<td>3</td>
</tr>
<tr>
<td>Basic Communications</td>
<td>9</td>
</tr>
</tbody>
</table>

### Other Requirements

#### Junior Year

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 107</td>
</tr>
<tr>
<td>Econ 108</td>
</tr>
<tr>
<td>BA 4</td>
</tr>
<tr>
<td>BA 133</td>
</tr>
<tr>
<td>BA 149 or BA 151</td>
</tr>
<tr>
<td>Ag Econ 163</td>
</tr>
<tr>
<td>Ag Econ 112</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 166</td>
</tr>
<tr>
<td>BA 171</td>
</tr>
<tr>
<td>BA 181</td>
</tr>
<tr>
<td>Ag Econ 145</td>
</tr>
<tr>
<td>Ag Econ 106</td>
</tr>
<tr>
<td>Ag Econ 180</td>
</tr>
</tbody>
</table>

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

### General Agriculture

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exact Science</td>
</tr>
<tr>
<td>Biological Science</td>
</tr>
<tr>
<td>Humanities</td>
</tr>
<tr>
<td>Basic Communications</td>
</tr>
<tr>
<td>Irrigation and Drainage</td>
</tr>
<tr>
<td>General Agriculture</td>
</tr>
<tr>
<td>PE or MS</td>
</tr>
<tr>
<td>Social and Behavioral Science</td>
</tr>
</tbody>
</table>

In addition, under the General Agriculture curriculum students

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1. In addition to the courses listed above, Math 24, 25, 26 and Geology 31, Chemistry 31, Physics 6 will be allowed.

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

3. Social and Behavioral Sciences requirements must include Econ 51 and 52, BA 1, 2, and 3 or 100, and Ag Econ 56.

4. Exact Science requirements should be filled from the following courses: Chemistry 10, 11, 12 or equivalent; Math 34, 35, 44 or 46, Geology 3.

5. Biological Science requirements should be filled from the following: Botany 24, 26; Zoology 3, 4; Bacteriology 10 or 70 and 71.

6. Limited to new freshmen in Agriculture.

7. A minimum of 26 credits required in the two areas—not less than 10 credits in each.
must take Agronomy 56, Agricultural Economics 71, 72, and 73, (nine hours) or the equivalent, and a minimum of one three-credit course in each of two departments in applied animal science and one three-credit course in each of two departments in applied plant science. Any deviations from these requirements must be approved by the Dean.

Agricultural Education—Four Years

<table>
<thead>
<tr>
<th>Hours</th>
<th>Biological Science¹</th>
<th>Exact Science²</th>
<th>Agriculture</th>
<th>Education</th>
<th>Humanities</th>
<th>Social and Behavioral Science</th>
<th>Basic Communications</th>
<th>MS or PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>33</td>
<td>84</td>
<td>35</td>
<td>10-15²</td>
<td>10-15²</td>
<td>9</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

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

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 Education 1, 101, 102, or 103; 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. (IF) Dean and Staff

A Minor in Journalism

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

A Minor in International Agriculture

Students interested in foreign assignments in agriculture have an opportunity to take a minor in International Agriculture, provided they complete a satisfactory major in Agriculture. Those who plan to

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¹Biological Science requirements must be filled from the following courses: Botany 24, 25; Zoology 3, 4; Bacteriology 70, 71; Zoology 112.

²In addition to the courses listed above, Geology 3, Chemistry 10, 11, 12, or Physics 6 will be allowed.

³A minimum of 25 credits required in these two areas—not less than 10 credits in each.
minor in International Agriculture should carefully select general education classes from among the following: Anth 90, 92; Econ 51; Foreign Language (to meet needs); Geog 5, 6, 7; Hist 1, 2, 3, 4, 5; Pol Sci 10, 25; Psych 53; and Soc 70.

The upper division courses selected for a minor in International Agriculture should be made from the following list with other suitable courses to be substituted at the counselor's discretion. Eighteen hours are required for a minor. Ag Econ: Econ of World Ag and Econ of Food Consumption and Distribution; Agron: World Crops & Soils; Agron & Plant Pathology; International Plant Disease Problems; An Hus; International An Nutrition; Anth 162, 165, and Principles of Anth; Bus Admin 155; Econ 140, 150, and Comparative Econ Systems; Geog 135, 145, 146, 147; Hist 166, 167, 168; Pol Sci 101, 102, 110, 128, 150, 170, 171, 172, 173; Soc 154, 156. Seminar Courses.

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

Head: Professor George T. Blanch
Office in Agricultural Science 230


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

*On leave.
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 BS 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.

**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 Communications</td>
<td>9</td>
</tr>
<tr>
<td>Humanities</td>
<td>10</td>
</tr>
<tr>
<td>Exact Science</td>
<td>23</td>
</tr>
<tr>
<td>Biological Science</td>
<td>16</td>
</tr>
<tr>
<td>Social Science</td>
<td>10</td>
</tr>
<tr>
<td>PE or MS</td>
<td>3</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>

**Junior and Senior Years**

The student and his adviser 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>
</tbody>
</table>

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

(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>
<tr>
<td>Agricultural Production</td>
<td>6</td>
</tr>
</tbody>
</table>

**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 MS degree is accepted by other universities as work done toward the PhD degree. All upper division courses in Agricultural Economics may be used for graduate credit in an Agricultural major.

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

**Agricultural Economics Courses**

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

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

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

105. **Agricultural Credit.** Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. (3F) Morrison
**106. Land Economics.** Economics 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. (3Sp) Wennegren


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

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

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

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

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

163. Intermediate Agricultural Marketing. Principles and functions of marketing and their application to the marketing of agricultural products. (5W) Anderson

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) Blanch

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

202. Advanced Farm Management. Economic principles and their application to specific production functions in agriculture. (6F) Davis

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

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

240. Research Methodology. Philosophy of research and use of scientific method in the solution of problems. (3F) Roberts

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

263. Advanced Marketing. Economic principles applied to the solution of agricultural marketing problems. (6W) Lamborn


*Taught 1965-66

**Taught 1966-67

**Department of Agricultural Education

**Head:** Professor Stanley S. Richardson

**Office in Agricultural Science 110**

**Associate Professor Von H. Jarrett.**

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 and other agricultural experiences, a broad back-
ground in the Major fields of human knowledge, general education in agriculture, and a program of education to enable them to teach youth and adults. 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.

**Prescribed Courses for Majors in Agricultural Education**

<table>
<thead>
<tr>
<th>Biological Science:</th>
<th>Cr. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany 241</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 31</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 112 (Genetics)</td>
<td>5</td>
</tr>
<tr>
<td>Bacteriology 10 or 70, and 712</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Humanities:</th>
<th>Cr. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Planning1</td>
<td>3</td>
</tr>
<tr>
<td>Speech, or Music1 or Language1 or Art or Literature1 or Horticulture 118</td>
<td>132</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>English:</th>
<th>Cr. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Communication 1, 2, 3</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social and Behavioral Sciences:</th>
<th>Cr. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychology 53, Ag Econ 71, 72, 73</td>
<td>3</td>
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<tr>
<td>Sociology 10 or 70 or Econ 51, 52</td>
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<tr>
<td>or Political Science 1 or 100 or History 20</td>
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<th>Exact Science:</th>
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<tr>
<td>Chemistry 10, 11, 121 (or equivalent)</td>
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<tr>
<td>Mathematics 342</td>
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<td>Physics 6 or 7,</td>
<td>22</td>
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<td>Geology 3 or Math 35</td>
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| Total                | 77        |

Basic and minimum requirements in Agriculture, and Education:

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<tr>
<th>Animal Industry:</th>
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<tr>
<td>Anim Hus 19</td>
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<tbody>
<tr>
<td>Agron 56 Soils</td>
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<tr>
<td>Elective</td>
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*Courses which meet lower division group requirements.

*Not less than 25 hours in Humanities and Social and Behavioral Science.

**Agricultural Economics:**

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**Agriculture:**

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**Agricultural Mechanics:**

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<tbody>
<tr>
<td>Irrig 10</td>
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<tr>
<td>Ag Ed 1, 101, 102, 103</td>
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**Total** | 84

**Education:**

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<td>Ag Education 112, 124, 125, 126</td>
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<td>Education 126, 150</td>
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<tr>
<td>Psychology 100, 106</td>
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<tr>
<td>Public Health 155 or 154</td>
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**Total** | 33

**Total Minimum Requirements**

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<tbody>
<tr>
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<tr>
<td>Agriculture</td>
</tr>
<tr>
<td>Education</td>
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<tr>
<td>Military Science or PE</td>
</tr>
</tbody>
</table>

**Total** | 197

**Graduate Study**

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

**Agricultural Education Courses**

1. **Agricultural 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. (6F, W) Jarrett

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

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

103. **Agricultural Machinery.** Selection, operation, maintenance, 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. (SF) Jarrett

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


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

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

126. Directed Teaching in Agriculture. Students observe and teach under supervision in approved vocational agriculture departments.

Students will leave the campus to teach for five or six weeks. (4-9W, Sp) Richardson


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

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

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) Staff

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

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

A major in General Animal Science will prepare you 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

**Course** | **FRESHMAN** | **Credit**
---|---|---
AH 2, 50 | 3
Math 34, 35 and 44 or 46 | 11 or 13
MS or PE | 3
English 1, 2, and 3 | 9
Ag Econ 71, 72 and 73 | 9
Social Science | 5
Zoology 3 | 5
Electives | 5 or 3

---

**Course** | **SOPHOMORE** | **Credit**
---|---|---
AH 41, 42 | 2
Chemistry 10, 11 and 12 or 8, 4, 5 and 121 | 15 or 19
MS or PE | 3
Botany 24, Zoology 4 or Botany 28, 30 | 10 or 15
VS 29 | 5
Agronomy 56 | 4
Humanities | 5
Social Science | 3

---

**Course** | **JUNIOR** | **Credit**
---|---|---
AH 150, 151, 152, 155, 156 | 16
Zoology 112, 142 | 8
Dairy or Poultry | 3
Agronomy 103 | 4
Irrigation and Drainage 10 or 110 | 3
Surveying 81 | 3
Humanities | 10
Electives | 3

---

**Course** | **SENIOR** | **Credit**
---|---|---
AH 110, 120; 125, 160, 175 | 15
Entomology 108 | 6
Ag Edue 161 | 3
Business 20 or 147, 68 | 6
VS 150, 160 | 7
Range Management 160 | 6
Electives | 4

---

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

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; PE or MS three hours.

In addition, the following courses should be completed: Ag Econ 163, 180 or the equivalent; Agronomy 56, 103, or Range Management 160, 161; An Hus 2 or 165, 50, 41 42, 150, 151, 152, 155, 160; Chemistry 190; VS 20; Zoology 112.

To specialize in nutrition students should also complete either Physiology 121 and 122 or Chemistry 121, 122, 123.

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:

**AH 2**: 10; 41, 42 and 50 or 120:
- AH 110, 125 | 16
- VS 120 | 4
- Agronomy 56, 103 or Rge Mgt 160 | 8
- Ag Econ 71, 72, 72 | 9
- Ag Eng 1, 10, 102, 103 | 19
- Welding 91 | 5
- English 1, 2, 3 | 9
- Math 54 | 3
- PS 10, Sociology 10 or 70 | 10
- PE and Electives | 13

---

Graduate Study

*Master of Science Degree.* The Animal Science Department offers the Master of Science degree in
Animal Production, Animal Breeding, Animal Nutrition and Poultry Nutrition and Management. 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 Science 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) Steffen

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

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. (8W) Steffen

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

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

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

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: AH 152. (3F, Sp) Madsen

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

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

142. Physiology of Reproduction. See Zoology 142. (3W) Foote

150, 151. Animal Nutrition. Basic principles of the metabolism of nutrients and nutrient requirements of farm animals; nutritional diseases; and a consideration of investigational methods. Prerequisite: Chemistry 12. (3F, 3W) Street

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

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

160. Livestock Production Problems. Attention is given various problems in livestock production, especially in Utah. Prerequisite or concurrent registration: AH 152 and 155. (3Sp) Staff

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

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

185. Meats. Cutting, selection, and identification of wholesale and retail cuts of beef, pork, and lamb, with references to prices, relative economy, uses, nutritive value, chemical composition, and palatability. Prepara-
### 48 College of Agriculture

Suggested Course of Study with emphasis on Poultry

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Physiology 4</td>
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<td>Poultry 1</td>
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<td>Poultry 2</td>
<td>1</td>
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<tr>
<td>Math 35</td>
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<td>MS or PE</td>
<td>3</td>
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<tr>
<td>Bacteriology 70</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 3</td>
<td>5</td>
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<tr>
<td>Vet Sci 29</td>
<td>6</td>
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<td>English 1, 2, 3</td>
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<td>Rural Soc 10</td>
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**FRESHMAN**

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<td>Chemistry 3, 4, 12, or 10, 11, 12</td>
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<td>Plant Science 56</td>
<td>4</td>
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<td>Soc Sci</td>
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<td>Ag Econ 71, 72, 78</td>
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<td>AS 161</td>
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**SOPHOMORE**

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<tr>
<td>Lib Sci</td>
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<tr>
<td>Zoology 112</td>
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<td>Poultry Hus 126, 107, 105, or 104, AS 155</td>
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<td>Vet Sci 120</td>
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<td>AS 151</td>
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**JUNIOR**

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<td>Entomology 108</td>
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<td>Poultry 125, 126, 105, or AH 155</td>
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<td>Ag Engr 101</td>
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<td>Appl Stat 51, 131, 132</td>
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**SENIOR**

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<td>Physiology 121, 122</td>
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<td>Entomology 108</td>
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<td>12</td>
</tr>
<tr>
<td>Electives</td>
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</table>

### Poultry Courses

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

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

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*Taught 1965-66
**Taught 1966-67*
**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. (4Sp) **Staff**

**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**

**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. (3Sp) **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, Sp) **Staff**

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

**Poultry Diseases.** (See Veterinary Science 120.) (4Sp) **Principles of Nutrition.** (See Animal Husbandry 150.) (4F) **Staff**

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

**211. Research Problems in Poultry Husbandry.** (Non-thesis.) Credit arranged. (F, W, Sp) **Staff**

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**Taught 1966-67**

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**Department of**

**Dairy Science**

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

**Professors** George Q. Bateman, Emeritus, Lloyd R. Hunsaker, District Extension Director, A. J. Morris, Emeritus, Vearl R. Smith, Dean of College of Agriculture; **Associate Professors** John J. Barnard, Extension Dairyman, Paul B. Larsen; **Assistant Professors** Clive W. Arave, Charles H. Mickelsen; **Research Assistant** LaMon Perkes; **Collaborators** Melvin J. Anderson, Robert C. Lamb.

Dairy Science offers 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. In some instances, students interested in other complimentary subjects plan a course of study to include training in both areas.

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.

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**Dairy Production**

Most students develop a program under the General Curriculum or Applied Science curriculum. Those who wish a Business Curriculum may develop this with approval of the Department to conform with the requirements of the College of Agriculture and the Department of Dairy Science.

**General curriculum.** Designed for a major in Dairy Production to prepare for 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 for the University and the College of Agriculture. The following courses are also required: Dairy 6, 51, 110, 112, 120, 121, 122 and at least three quarters of 215; Agricultural Economics 71, 72, 73; Agronomy 56, 103; Animal Husbandry 150, 151; Bacteriology 10 or 70, 104; Chemistry 10, 11, 12; Mathematics 34, 35; Veterinary Science 20, 120; Zoology 3, 4, 112.

The following courses are recommended: Agricultural Economics 102; Agronomy 7; Animal Husbandry 152, 155; Business Administration 20, 63, 100, 147; Entomology 108; Physics 6; Veterinary Science 150.

Applied Science Curriculum. Designed for a major in Dairy Production to prepare for technical employment in the industry 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, 51, 110, 112, 120, 121, 122 and at least three quarters of 215; Agricultural Economics 71, 72, 73; Agronomy 56, 103; Animal Husbandry 150, 151; Bacteriology 10 or 70, 104; Chemistry 10, 11, 12; Mathematics 34, 35; Veterinary Science 20, 120; Zoology 3, 4, 112.

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 121, 122, 180; (2) Breeding—Animal Husbandry 155; Applied Statistics 51; Chemistry 12; Math 44 or 46, 97, 98, 99; Veterinary Science 150; (3) Physiology—Chemistry 115, 121, 122; Physiology 121, 122, 141; Veterinary Science 150; 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 sanitarian.

In addition to the general University and College of Agriculture requirements they will be required to take: Chemistry 180; Bacteriology 104, 105; Business Administration 20, 63, 156, 185; Dairy Industry 5, 6, 101, 103, 104, 105, 110, 121, 254, and at least 3 quarters of DI 215.

**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, 171; Dairy Industry 5, 6, 101, 103, 104, 105, 110, 121, 254, and at least 3 quarters of DI 215.

**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, 115, 121, 122, 180; 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, 254, and at least 3 quarters of DI 215.
Graduate Study

The Dairy Science 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 Nutrition and Biochemistry Interdepartmental Curriculum as outlined in this catalog under School of Graduate Studies.

Dairy Courses

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


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

*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 floes. Merchandising and selling are included. (5Sp) Morris

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

**104. Concentrated Milks and Butter. Factors involved in the manufacture of concentrated milk products and butter. Consideration is given to plant processes, equipment and the chemical, physical and bacteriological aspects relating to quality. (6F) Larsen

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, Sp) Morris and Larsen

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

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

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


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

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

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

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

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

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*Taught 1966-67

**Taught 1966-67
Department of

Plant Science

(Agronomy, Crop Science, Floriculture, Food Technology, Pomology, Vegetable Crops)

Acting Head: Professor Devere R. McAllister
Office in Agricultural Science 322


Study and research in Plant Science focus upon problems of crop production 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. Four types of majors for the Bachelor's degree are offered: Agronomy, Crop Science, Horticulture and Horticultural Science with specialization in Floriculture, Food Technology, Pomology, or Vegetable Crops in either the Science or General curriculum.

Majors must have a grade point of 2.5 or better in all Plant Science courses. Any Plant Science 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.

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; Crops 7, 8, 103, 109, 112, 118, and 120; Soils 56, 107, 111, 114, and 155; Met 17; Animal Sciences six hours; Bacteriology 10, or 70 and 71; Botany 24, 25, and 120 or 130; Chemistry 10, 11, and 12; Entomology 108; Gen Ag 1; Geology 3; Horticulture, three hours; 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. Students with special aptitudes in the fundamental sciences and interested in plant sciences will find unlimited opportunities in this field.

In addition to the general University group requirements students should take Ag Eng 10 or 110: Agronomy 7, 8, 103, 109, 112, 118, and 120; Soils 56, 107, 111, and 155 or 165; Appl Stat 131 and 152; 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.

General Horticulture

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

In addition to the University and College of Agriculture requirements the following courses are required to satisfy Department requirements for a BS degree: Soils 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: Soils 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, 44 or 46, 97, 98 and 99; Physics 17, 18, 19 or 20, 21 and 22; and Zoology 112.

Graduate Study

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

Upper division courses acceptable for graduate credit toward the Master of Science degree in Plant Science are: Agronomy 109, 110, 120 and Horticulture 130, 131, 140, and in addition, for transfer majors
Doctor of Philosophy Degree. The Department, in cooperation with related departments, offers the degree of Doctor of Philosophy in Plant Nutrition, Crop Management and Food Technology, Plant Breeding and Physiology. Detailed information may be obtained from the Department or from the Dean of the School of Graduate Studies. (Also see Catalog, School of Graduate Studies.)

Agronomy Courses

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

8. Root and Miscellaneous Crops. Cultural methods, market grades and commercial possibilities of sugar beets, potatoes, tobacco, and other crops are studied. (3F) 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. (4Sp) Allred

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


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

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; an analysis of the possibilities in typical climatic areas and on important soil types. Prerequisites: Agronomy 7 and 56. (2W) McAllister

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. (4P) McAllister

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

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. (2F) Anderson

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) Anderson, Hamson

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

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

17. House Plant Care. Identification, propagation, cultural requirements and pests of house plants; also forcing of bulbs and woody branches for spring blooms. (1P) Wesenberg
100. Pruning and Grafting. A practical course for all students in the University, dealing with the science and art of pruning and grafting of horticultural plants. Special emphasis is placed on fruit trees, but the small fruits and ornamental trees and shrubs are also included. (2W) Walker

**101, 102. Advanced Horticulture. Fundamental principles relating to horticultural practices; growth and development, nutrition, water relations, temperature, light, fruit setting, and growth regulators. Course 101 deals primarily with vegetable crops and 102 with fruit crops. These courses may be taken separately or in any sequence. Prerequisite: Botany 24, 25 (Botany 120 may be taken concurrently); Chemistry 12 or 121; Agronomy 156; Horticulture 1 or 4. Three lectures, one lab. (4W, 4Sp) Hamson, Walker


**122. Nursery Management. Production of ornamental nursery stock, including shrubs, trees, and evergreens. Layout and operation of commercial outlets. Prerequisite: Botany 24. (3W) Wesenberg

**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 Departments of Botany, Horticulture, and Zoology. Prerequisites: Botany 130, Entomology 108 or special permission. Three lectures, two labs. (5Sp) Anderson, Cannon, Davis

*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, radiation, transportation, and distribution. Prerequisites: Bacteriology 10 or 70 and 71; Chemistry 3, 4, 5, or 10, 11, 12; Botany 24, 25, 180; 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 radiation, 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, W, Sp) 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. (1-6, F, W, Sp) Staff

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

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

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

*Taught 1965-66
**Taught 1966-67
Study and research in soils and meteorology fundamental to phases of biology and engineering particularly the ecological and plant growth aspects, irrigation hydrology, and soil mechanics is undertaken in the department. Emphasis is found upon problems connected with arid to semi-humid soil and climate complex that is characteristic of the intermountain and Great Basin region of western U.S.A. Bachelor of Science major is offered in soils and minors are offered in Soils and meteorology.

Soils

A major in soils or soils and meteorology is prepared for graduate study in various phases of soils, or related fields, pertaining to plant growth, irrigation, conservation and hydrology. He is prepared for employment in research, soil testing, land classification and soil management. Students will find real opportunity in this major if they achieve high scholastic standing.

In addition to general University group requirements one should take Soils 56, 107, 111, 114, 155 and 165; Meteorology 17 or 175; Ag Engineering 10 or 110; Geology 3; Chemistry 3, 4, 5 and 115; Mathematics through 99; Physics 17, 18 and 19 or 20, 21 and 22; plus at least 5 hours of upper division Mathematics, Chemistry, or Physics; Bacteriology 70 and 71; Botany 24 and 25 and at least 10 hours additional in the plant science area; English 111 or 113. Students following this curriculum will meet the minimum approved by the Soil Science Society of America.

Graduate Study

Master of Science Degree. The Department, in cooperation with related departments, offers master of science programs in soil physics, soil chemistry, soil fertility or plant nutrition, soil genesis, and soils and irrigation. A Master of Science degree in the department is accepted by most other universities as equivalent to a year’s work toward a Doctor of Philosophy degree in the subject pursued.

Doctor of Philosophy Degree. The Department, in cooperation with related departments, offers the degree of doctor of philosophy in: soil physics, soil chemistry, soil fertility or plant nutrition, soil genesis, and soils and irrigation. Detailed information may be obtained from the Department or from the Dean of the School of Graduate Studies.

Acceptance. Student applications, submitted to the School of Gradu-
ate Studies, for advanced study in Soils and Meteorology are reviewed by a departmental committee. The applicant may be accepted without reservation, accepted on probation, accepted as a non-candidate, or rejected. Under extenuating circumstances, students may be accepted on a probationary basis; however, they will not be assigned a research problem, research credit, a graduate committee, or considered for an assistantship until such probation has been removed as a result of academic excellence. This probationary status cannot be indefinite and is limited to two quarters. A probationary student who does not maintain B grades or better will not be permitted to continue in the department.

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

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

Soils Courses


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. (6Sp) 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) Smith

110. Soil Microbiology. See Bacteriology 110.

111. Soil Seminar. Review and discussion of current soil problems and literature. Required of all seniors in department. (1W) 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. (6Sp) Miller

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

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. Prerequisites: Agronomy 107, General Physics or Chemistry. (3W) Taylor

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

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

218. Special Problems. Soils or meteorology. Students review literature on the problem and conduct experiments. Credit arranged. (F, W, Sp, Su) Staff


*221. Genesis, Morphology and Mineralogy of Soils. A critical review of soil mineralogy and of soil forming factors in relation to genetic and morphological patterns of soils. Prerequisite: Agronomy 114 or equivalent. (3F) Miller

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

**227. Chemical Analysis of Soils. A laboratory course in chemical analysis of soils and plants. Two laboratory periods. Prerequisite: Permission of the teacher. (2W) Miller


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

A minor in Meteorology will include Meteorology 17, 135 and 175, plus additional credits as approved by the faculty of Soils and Meteorology.

Meteorology Courses

17. Introduction to Weather and Climate. A survey course which treats temperature, wind clouds, precipitation, storms, air masses, atmospheric circulation, and the impact of weather and climate upon human activities. (8F) Ashcroft

135. Bioclimatology. Interrelations between living organisms, both plants and animals including man, and the physical and chemical factors of their atmosphere environment. (3-5p) Ashcroft

175. Boundary-Layer Meteorology. A treatment of heat and moisture exchange between the earth’s surface and the air layer above. This exchange is considered from the energy balance and aerodynamic approaches in addition to several empirical and semiempirical techniques. Prerequisite: Mathematics 99. (3W) Ashcroft

Department of

Veterinary Science

Head: Professor Merthyr L. Miner
Office in Veterinary Science Building

Associate Professors Joseph T. Blake, Ross A. Smart, Johannes Storz, Don W. Thomas; Assistant Professors Jay W. Call, James A. Thomas; Research Associate Arland E. Olson; Research Assistants Robert Davis, Merle Marriott, Robert Thornley; Collaborators Wayne Binns, Lynn F. James, James L. Shupe.

Courses in this department are not designed to train individuals to become veterinarians. Rather, the courses help round out training in related 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 (DVM), he must have at least two years or preferably three of pre-veterinary training at an ac-
credited 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 pre-veterinary 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 10-15 hours (literature, world civilization, speech, language, art, music); Social Science, 10-15 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 reproductive 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 operations on animals. Three lectures, one lab. (4Sp) Call

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

150. Artificial Insemination of Animals. A study of the basic concepts of the science of reproduction as related to artificial insemination, training in the art and the management of artificial insemination organizations. The course is for majors in the animal science field who have had courses in anatomy and physiology, bacteriology nutrition and breeding. One lecture, two labs. (5Sp) Call

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

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

230. General Pathology. An introduction to the cause and mechanism of disease processes: degenerative changes, circulatory disturbances, inflammation, regeneration, neoplasms, and 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: VS 230. Three lectures, two labs. (5Sp) Miner

*Taught 1965-66
**Taught 1966-67
College of Agriculture

Interdepartmental Curriculum in

Food Science and Technology


Through an interdepartmental committee, the several colleges of the University are cooperating to provide an integrated program of teaching and research that will meet diversified needs of many industrial and academic fields in which a training of Food Science and Technology is essential.

Food Science and Technology encompasses the application of science and technology to handling, transportation, manufacturing, storage, distribution, marketing, and utilization of foods. Several food industries require trained personnel to select raw material, to control manufacturing operation, to solve technical problems of palatability, nutritive value, keeping quality of foods and to investigate new methods of handling, storage, transportation and processing. Likewise, many opportunities in federal and state agencies, research laboratories, private research institutes, large hospitals, cafeterias and foreign assignments are available.

The undergraduate curriculum is designed to prepare students for service and leadership with adequate foundation in basic sciences of physics, mathematics, chemistry, and biology. Some latitude is also provided through restricted electives for students to acquire additional training in science and technology of fruit, vegetable, grain, meat, and dairy products or in business and marketing. The electives chosen will depend upon the professional goal of the student and must be selected in consultation with the adviser, and the chairman of the curriculum.

Several lines of specializations are available:

1. Dairy Manufacturing
2. Animal Products (including poultry)
3. Handling and Processing of Agronomic and Horticultural Products.
4. Chemical, Nutritional, Marketing and Microbiological Aspects of Foods
5. Food Marketing.

Above discussion will give students broad background in basic sciences as well as a more specialized concept in a study of foods.

Students studying toward a BS degree in Food Science and Technology must complete the University, the College and the Departmental requirements in addition and/or in concurrence with the following Food Science and Technology Curriculum requirements: Bacteriology (70 or 10, 71, 120, 121); Chemistry (3, 4, 5 or 10, 11, 101, 115, 121, 122, 190, and a course in food toxicology); Botany (24, 25, 120, 130); Zoology (3, 4, 112); Economics and/or Agricultural Economics (Ag Econ 163, Economics 170); Mathematics (97, 98, 99 especially for those who plan on doing graduate work); Physics
(17, 18, 19); Industrial Education (15); Agricultural Entomology (108); Physiology (4); Horticulture (131, 139, 140); Dairy Science (at least two courses from 101, 130, 104 104); Business Administration (63); Animal Science (185); Food and Nutrition (5, 107, 108, 109, 140, 146); Applied Statistics (51). Agricultural Engineering (a new course will be created to cover design, construction, and operation of food plants and processing technology).

Plant Science (a new course will be created to cover farm crop products such as potato and corn products, sugars, breakfast foods, milling, brewing, etc.).

Restricted electives will be arranged from the above courses, if needed, with the approval of the adviser and the chairman of the committee. D. K. Salunkhe is chairman for 1963-65.
COLLEGE OF BUSINESS
AND SOCIAL SCIENCES
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  Master of Business Administration
  Doctor of Philosophy
  Also, ROTC Commission
The American economy today provides an unusual opportunity for enterprising managers and businessmen. In a free enterprise economy such as ours, the decisions of the business world are made by individual managers and owners of business. The very course of our national progress and prosperity is determined by the decisions and actions of businessmen. As never before, we need leadership in this area. We are currently challenged by an alternative approach—totalitarian state planning. If our system is to survive and grow, dynamic, imaginative leadership is needed in the business world, and great rewards await those who can provide this leadership.

Throughout all history man has been faced with certain crucial social problems which have never been solved: crime, poverty, tyranny, prejudice, war, injustice—the list is legion. The Social Sciences take as their special province the study of individual and group relationships and behavior, and thus attempt to explain, understand, and provide solutions to these great problems. Political Science explores the methods of government, or group law and order, vitally necessary for the preservation of our democracy and personal liberties. Economics analyzes the production and utilization of goods and services and the allocation of our scarce resources which set a ceaseless limitation on our abilities to fulfill man’s aspirations. History studies the full sweep of man’s experience with the hope that we can learn from our forefathers’ 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. Anthropology studies diverse cultures such as the American Indian. Special attention is given to social work, crime, population problems, women’s role in society, and other great sociologic problems which beset us. Many of mankind’s greatest problems lie in the field of the Social Sciences. The challenge, as well as the opportunity, for significant breakthroughs has never been 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 six 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, Distributive Education, Office Administration, and a combination major in Office Administration and Family Life. The Department of Economics offers a major in Economics. The Depart-
ment of History offers a major in History. The Department of Political Science offers majors in 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, 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. A lucrative work-study program is available for outstanding students in this college in cooperation with Thiokol Chemical. Internships are also available in accounting and political science.

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

Head: Associate Professor D. W. Dobler
Office in Main 131

Professors William M. Bell, Emeritus, Norman S. Cannon, Robert P. Collier, Dean, College of Business and Social Sciences, V. D. Gardner, Emeritus, L. Mark Neuberger; Associate Professors Lyle H. McIff, Robert Pietrowski; Assistant Professors Bert Bauer, Howard Calder, Howard Carlisle, Raymond James1, Eugene C. Kartchner, Calvin Lowe, William V. Tezak, Robert Viets1; Instructor Judith Bills; Lecturers Ceanne Bauer, Serge Benson, Alan Matheson, Charles P. Olson.

The basic objective of the first two years' program in the Department of Business Administration is to provide a broad and sound educational foundation upon which to build the student's specialized education for business. The objective of the last two years of the Business
Administration program is to provide sufficient specialized business training to prepare the student to successfully enter the business world in his chosen functional field. At the same time, the program attempts to provide the type of general business education that develops the attitudes and analytical ability required for future professional advancement.

The following program is recommended for Business majors during the first two years:

**FRESHMAN**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Basic Communications</td>
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<tr>
<td>Natural Science (Math, Physiology, Biology, Physics, Chemistry, etc.: Math 34 &amp; 35 are required.)</td>
<td>20</td>
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<tr>
<td>Political Science 1 or 10</td>
<td>5</td>
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<tr>
<td>History, Sociology 70 or Psychology 53</td>
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<td>Approved Electives</td>
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<td><strong>PE, MS, or AS</strong></td>
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<td><strong>Total</strong></td>
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**SOPHOMORE**

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<th>Course</th>
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<td>BA 1, 2, 3, Introductory Accounting</td>
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</tr>
<tr>
<td>BA 4, 5, 6, Business Law</td>
<td>6</td>
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<td>Economics 51, 62</td>
<td>10</td>
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<td>Humanities</td>
<td>15</td>
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<tr>
<td>Approved Electives (Computer Science, MS, or AS, if desired)</td>
<td>8-12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>48 to 52</td>
</tr>
</tbody>
</table>

This program for the first two years includes few business courses and definitely stresses general education in the Social Sciences, the Natural Sciences, and the Humanities. It fills the lower division group requirements, as well as the institutional requirement for an understanding of the American System.

During the last two years all Business Administration majors must take the following core courses:

**REQUIRED CORE COURSES**

- BA 131, 132, Business Statistics
- BA 133, Management Concepts
- BA 134, Production
- BA 149, Business Policy
- BA 150, Managerial Accounting
- BA 151, Marketing Principles
- BA 171, Personnel Administration
- BA 181, Corporation Finance

In addition to the preceding core courses, all Business Administration students must complete the course requirements in one of the following functional fields of business.

**Accounting**

Accounting provides the financial data which management uses in controlling the business enterprise. It emphasizes the interpretation and analysis of data. A major in this area should take the following courses in addition to the general lower division and departmental core requirements: Junior year: BA 101, 102, 103, 111, Economics 107, 165; Senior year: BA 121, 122, 127, Economics 108 or 171, as well as additional Business Law. Accounting majors customarily take a minor in Economics.

If a student is interested in a professional career in Accounting, he will find the following courses valuable additions to his program: BA 119, 128, 129, 201, 202, 207, 211, 298, CS 111, 135 and 157. This material can be worked into the elective section of a four-year program. However, several professional accounting organizations have gone on record as favoring a fifth year in which to cover this additional area. Students with good scholastic records would be well advised to seek the Master of Science degree in this fifth year.

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1. If the PE option is elected, PE 1, PE 16 or 52, and an activity course must be taken or proficiency tests passed.
2. These courses must be taken prior to entering the upper division Business Administration program.
3. These courses should be taken as early in the Junior year as possible.
Finance

Finance concentrates upon the management of money in business and investment institutions. If a student elects to major in this field, he should take the following courses in addition to the basic core: Junior year: Economics 107, 165, 171, 190, BA 143 or English 112. Senior year: BA 182, Economics 139, 155. Additional work in Math and Computer Science is also valuable.

Marketing

Marketing is concerned with the distribution or “cash-register” phase of business. Marketing is the final and indispensable link in the business chain of finance—production—distribution activities. Students electing to major in marketing should take the following courses in addition to the basic core. Junior year: BA 143, 152, 153 and Economics 107. Senior year: BA 156 or 160 or 161 and Economics 165 and 171.

Personnel and Industrial Relations

All business operations depend upon manpower; its effective coordination is essential to the success of the enterprise. If students are particularly interested in the recruiting, testing, training, and human relations aspects of management, they should take the following courses in addition to the basic core: Junior year: BA 143, Economics 125, 126, 127, Psychology 155. Senior year: BA 172, 173, Economics 107 and 108 (or Economics 171 and 174), Sociology 158.

Production Management

The production activity gives shape to a firm’s physical products; production management involves the planning, directing, and controlling of activities related to production. Typical starting jobs for graduates are in procurement and materials control, production planning and control, quality control, cost control, and first line supervision. In addition to the basic core, required courses are: Junior year: BA 143 or Eng 112, Mfg E 56, 148, CS 157. Senior year: BA 136, 138, Mfg E 137, Economics 107, 125, 171, Speech 21. Computer science, mathematics, and technology courses are recommended electives.

Graduation Requirement

To be recommended by the Department for graduation, all Business Administration majors must have obtained a grade point average of at least 2.1 in both their BA courses and the courses in their minor field.

BA Major with Computer Science Minor

With the rapid acceptance of electronic data processing by the business world, a strong minor in Computer Science is a valuable adjunct to the training of most Business Administration majors. The following courses constitute a minor in Computer Science:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 111</td>
<td>Data Processing</td>
<td>3</td>
</tr>
<tr>
<td>CS 135</td>
<td>(Computer Programming, 1401)</td>
<td>5</td>
</tr>
<tr>
<td>CS 157</td>
<td>(Programming Business Problems)</td>
<td>3</td>
</tr>
<tr>
<td>AS 131 and 132</td>
<td>(Statistical Methods)</td>
<td>8</td>
</tr>
</tbody>
</table>

Dr. Rex Hurst in the Computer Center can recommend additional courses for students desiring further work in Computer Science.

Minor in Business Administration

A solid minor in Business can be extremely valuable when linked
to a major in Agriculture, Landscape Architecture, Forestry, Science, Home Economics, etc. Any student who expects to operate his own technical business or professional office should strongly consider a Business minor. The following courses are recommended as a minor:

**BA 100. Survey of Accounting Principles.** (4 credits) or BA 1, 2 3. Since the basic data with regard to the performance of the business firm is compiled and arranged by accountants, some knowledge of the vocabulary and principles of accounting is needed in virtually every private enterprise job.

**BA 133. Management Concepts.** (3 credits) An introductory course dealing with fundamental managerial concepts and problems.

**BA 151. Marketing Principles.** (5 credits) Helpful in developing an understanding of the distributive aspects of business, or how the goods are moved from the producer to the ultimate consumer.

**BA 171. Personnel Administration.** (5 credits) Develops a better understanding of the techniques for working with people and directing teams. This course is very helpful for students contemplating careers in small and large organizations alike.

**BA 181. Corporation Finance.** (5 credits) Especially helpful to a student who may be establishing his own firm and facing the problem of raising capital as well as the problem of meeting payrolls.

A student's adviser can help modify this basic list to fit a specific background and major (e.g. agriculture majors will likely replace BA 151 with marketing courses taught in their own departments.)

**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 research and individual development.

Financial assistance is available in the form of Graduate Assistantships for outstanding candidates. Graduate Assistants lead introductory sections of accounting or statistics, or otherwise assist individual faculty members. 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 program is open to qualified graduate students regardless of their undergraduate major. The time necessary for completion consequently depends on the individual's background and preparation. One year should suffice for well-trained Business and Economics majors, while two years may be required if the student has little or no previous business training. The program provides a broad training which focuses on general management and provides a basis for long-range advancement. It attempts to develop those attitudes, skills, and character needed in top level management throughout the years ahead. The program culminates in the completion of either a thesis or a series of research papers. Considerable flexibility exists in terms of the specialized study the student pursues in his independent research. However, the heart of this graduate program is a year-long seminar built upon group discussion of individual reports and 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 become Certified Public Accountants. This program can be completed in one year by students with a strong background in Accounting and Business but requires 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.

The Management Institute

In response to the educational needs of business and industry, the Management Institute of the College of Business and Social Sciences offers a variety of seminars, workshops, and conferences throughout the year. These are all non-credit offerings and cover such materials as the management of small business, executive development, decision making, sales promotion, professional secretarial training, etc.

For further information about the services provided through the Management Institute, please contact Director Robert F. Pietrowski.

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. (BA 1: 3F, W; BA 2: 3W, Sp; BA 3: 3F, Sp, Su) 
   Staff

4, 5, 6. Business Law. BA 4 is a general survey. It is also introductory for students who take additional Commercial Law courses. BA 5 and 6 are devoted to a comprehensive study of the law of contracts and agency. Open to all students of sophomore standing or above. (2F, 2W, 2Sp, 2Su) 
   Benson, Matheson, Olson

   Staff

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, W, Sp) 
   Lowe

63. Salesmanship. The history, development, and opportunity of sales work. Focuses on the principles of the selling process—interviews, presentation, holding attention, arousing desire, meeting objections, and creating acceptance. Special selling projects are conducted. Lecture and cases. (2F, Sp) 
   Lowe

   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 completion of special work. Prerequisite: BA 1, 2, 3. (4F, 4W, 4Sp) 
   Meliff

104, 105, 106, 107, 108. Business Law. 104 studies the law of negotiable instruments; 105 and 106 include study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. BA 105 and 106 alternate with 107 and 108. Prerequisites: BA 4, 5, 6 or the consent of the instructor. (3F, 3W, 3Sp) 
   Olson

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

113. Business Simulation. Principles of Model Building and a simulation of actual business problems as practice in decision making. (2Sp) 
   Jensen

117. Introduction to Stored Programming. Basic Computer logic, flow charting, routines, coding, library programs, and data processing application to business. (3W) 
   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. (3Sp) 
   Staff

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

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. (SSp) Cannon


133. Management Concepts. The investigation and application of fundamental concepts of management and organization theory. Prerequisite: Junior standing or above. Business majors should take this course fall or winter term of the Junior year. (3F, W, Su) Carlisle, Dobler

134. Production. A study of the production function and its problems, considering interrelationships with other business activities. Focuses on the managerial aspects of: production planning, procurement, inventory control, production control, quality control, layout, methods improvement, performance standards, and basic industrial processes. Prerequisite: BA 133. (SSp) Dobler

136. Procurement And Production Control. A study of the planning and direct control of materials and production activities. Broad topics covered include: industrial purchasing, the planning and control of inventories, and the planning and control of production. Prerequisites: BA 133, 134, Mfg E 56, 148 or equivalent. (SF) Dobler


138. Quantitative Methods For Production Management. A study of the application of quantitative techniques for analysis to selected production problems. Topics covered include: the use of graphic and schematic models, PERT, statistical process control, sampling inspection, and an introduction to the use of linear programming. Prerequisites: Math 35, BA 132, Mfg E 148, or equivalent. (SSp) 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, W, Su) Calder

141. Real Estate. Introduction to real estate contracts, forms, principles, and recent Federal housing legislation. (3W, Sp) Lowe

143. Business Communications. Fundamental principles of effective business writing, such as letters, memos, reports, etc. Not open to freshmen. (3F, W, Sp, Su) Staff


149. Business Policy. A coordinating course to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control, and social aspects of business. Prerequisites: BA 132, 133, 150, 181. (6W, Sp, Su) Gardner, Carlisle

150. Managerial Accounting. Emphasizes the use of accounting as a tool of control for management. Major aspects include budget and managerial control, break-even analysis, selection of alternatives. Prerequisites: BA 1, 2, 3, or equivalent. (6F, W, Sp) Gardner, Texak

151. Marketing Principles. Describes, analyzes, and evaluates our present marketing system. Provides basic tools and background for understanding marketing principles. (5F, W, Sp, Su) Staff

152. Marketing Problems and Cases. Devoted to the analysis of marketing case problems. Prerequisite: Marketing 151 or permission of the instructor. (6W) Staff

153. Marketing Readings and Research. Provides perspective by studying the changing market environment and outlook as conditions of our material welfare. Prerequisites: Marketing 151 and 152. (SSp) Staff


156. Principles of Advertising. Intended for those who as business executives may direct advertising programs. Includes study of the structure of advertisements for different products, choice of media, consumer research, and the work of advertising departments and agencies. Prerequisite: BA 151 (SF) Staff

160. Sales Management. A broad view of important phases of sales administration, planning, and execution applied to manufacturing and wholesale concerns. Deals specifically with the structure and functioning of sales organization and correlation of its activities with those of production and other departments of the business enterprise. Prerequisite: BA 151. (3W, Sp) Staff
72 College of Business and Social Sciences

161. Principles and Problems in Retailing. The marketing process from the viewpoint of the retail distributor: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. Prerequisite: BA 151. (6 Sp) Staff

171. Personnel Administration. Critical analysis of problems of human relations that confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems, and selected cases. (5F, W, Sp, Su) Marston, C. Bauer

172. Personnel Practices. Application of personnel techniques in the industrial setting. The study and application of job evaluation, wage administration, testing and selection, training programs, employee benefit programs, etc. (6F, W) Marston

173. Case Problems in Personnel Management. The application of principles of personnel administration to specific personnel problems commonly found in industry. Case studies will be used. (3Sp) 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; BA 1, 2, 3. (6F, W, Sp) Staff

182. Problems in Finance. The application of basic principles of finance to specific cases and problems of a typical nature. Prerequisites: BA 181, Economics 165. (3Sp) Staff

184. 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. (3F) Staff

185. Managing Personal Finances. The complexities of personal finance and investment studied from the individual investor's point of view. See also BB 186. (5W, Su) 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) Cannon


207. CPA 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. (3Sp) Cannon


211. Advanced Cost Accounting. Special cases in estimating costing, standard costing, direct costing, and advanced theory in cost accounting. (6Sp) Cannon

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


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

290. Thesis. For students preparing a Master's degree thesis. Credit arranged. (F, W, Sp, Su) Staff

291, 292, 293. Graduate Seminar in Business Administration. Discussion and individual research 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, Sp) Staff

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

298. Accounting Seminar. Credit arranged. (Sp) Cannon
Department of
Business Education and Office Administration

Head: Assistant Professor Robert E. Wiper
Office in Main 347

Associate Professor Floris Olsen; Assistant Professors Leah Dunford, Ted Ivarie, Calvin Lowe, Helen Lundstrom; Instructor Annette B. Peterson; Lecturer Glen Boyer.

The dual Department of Business Education and Office Administration offers three curriculums which provide students with an opportunity to pursue a degree that either prepares them to teach or to work in top-level office positions. The Business Education and Distributive Education curricula give 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 can lead to a highly respected, top-level office position.

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 undergraduate and graduate programs in Business Education are available for students preparing to teach, as well as for experienced teachers of business subjects.

The following is a list of requirements for students preparing to enter the Business Education profession. The program of studies for transfer students will be adjusted to meet the minimum professional certification requirements and allow for acceptance of transfer credit.

Composite Major BE, OA, BA

Minimum 60 hours
Major 30-50 hours
Minor (if desired) minimum 25 hours

OA 41 Elementary Typewriting or equivalent proficiency 2
OA 42 Intermediate Typewriting 2
OA 43 Advanced Typewriting 2
OA 65 Records Administration 3
OA 92 Business Machines 2
OA 167 Office Practice 2
OA 175 Office Management 3
OA 186 Secretarial Procedures 3
BA 4 Business Law 2
BA 5 Business Law 2
BA 6 Business Law 2
BA 1 Introductory Accounting 3
BA 2 Introductory Accounting 3
BA 143 Business Communications 3
BA 151 Marketing Principles 5
BA 171 Personnel Administration 5
Econ 51 General Economics 5
Econ 52 Economic Problems 5
BE 178 Methods of Teaching Business—non-skilled 3
BE 179 Methods of Teaching Typewriting and Office Practice 3
BE 185 Managing Personal Finances 5
BE 189 Principles of Business Education 3

It is recognized that some students may not want to enroll in shorthand and related stenographic
classes. Therefore, a non-stenographic program can be developed with Business Education advisors in which a related field of specialization can be pursued.

Business Education majors planning to prepare for teaching shorthand and related subjects are required to complete the following courses in addition to those listed above:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA 75</td>
<td>Shorthand I or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 76</td>
<td>Shorthand II or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 77</td>
<td>Shorthand III or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 141</td>
<td>Dictation and Transcription I</td>
<td>5</td>
</tr>
<tr>
<td>OA 142</td>
<td>Dictation and Transcription II</td>
<td>5</td>
</tr>
<tr>
<td>BE 180</td>
<td>Methods of Teaching Shorthand and Transcription</td>
<td>3</td>
</tr>
</tbody>
</table>

The following courses are strongly recommended, although not required, for Business Education majors:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 3</td>
<td>Introductory Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BA 140</td>
<td>Insurance or</td>
<td></td>
</tr>
<tr>
<td>Econ 127</td>
<td>Social Security or</td>
<td></td>
</tr>
<tr>
<td>BA 141</td>
<td>Real Estate</td>
<td>3</td>
</tr>
<tr>
<td>OA 85</td>
<td>Office Data Systems</td>
<td>3</td>
</tr>
<tr>
<td>BA 127</td>
<td>Income Tax Accounting</td>
<td>4</td>
</tr>
<tr>
<td>Speech 21</td>
<td>Intermediate Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, the following courses must be completed to qualify for secondary school certification in the State of Utah:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy 53</td>
<td>Elementary General Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psy 100</td>
<td>Human Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>Psy 106</td>
<td>Elementary Psychology for Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>PH 155</td>
<td>Public Health</td>
<td>3</td>
</tr>
<tr>
<td>Ed 126</td>
<td>Principles of Secondary Education</td>
<td>3</td>
</tr>
<tr>
<td>Ed 127</td>
<td>Secondary School Methods</td>
<td>3</td>
</tr>
<tr>
<td>Ed 129</td>
<td>Student Teaching</td>
<td>5</td>
</tr>
<tr>
<td>Ed 130</td>
<td>Student Teaching</td>
<td>4</td>
</tr>
<tr>
<td>Ed 150</td>
<td>Organization and Administration</td>
<td>3</td>
</tr>
</tbody>
</table>

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 be replaced by elective courses.

Business Education methods courses should be taken in the Junior year if student teaching is to be taken in the Fall or Winter Quarter of the Senior year. 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.

Students may count BE 179 and either BE 178 or BE 180 toward the 33-credit professional certification requirement if needed.

Graduate Study

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

Business Education Courses

150. Philosophy of Distributive Education. Philosophy of vocational business education with special emphasis on the importance of distributive education in a free enterprise system. (3F) Lowe

155. Methods of Teaching DE and Cooperative BE. Instructional methods and coordination techniques involved in teaching cooperative business and distributive education. Includes instructional materials, individual instruction kits, finding and maintaining training stations, selection of students, desirability of advisory committees and student club activities. Prerequisite BE 150 or instructor's permission. (3W) Lowe
178. Methods of Teaching Business—nonskilled. 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. (3Su) Ivarie

179. Methods of Teaching Typewriting and Office Practice. Instructional methods and new developments in teaching of typewriting. Methods for building accuracy, speed, and increasing production; work standards; classroom equipment and materials. Also, includes instructional methods and materials in teaching of office practice and business machines, class organization plans, equipment needs, cooperative training, standards and evaluation. For the inexperienced business teacher education student. (3W) Wiper

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. (8F) Lundstrom, Olsen

185. Managing Personal Finances. Designed to aid in meeting the growing complexity of personal finances; how to avoid financial entanglements, installment buying, borrowing money, owning or renting a home, investing and speculation in securities, everyday legal problems dealing with illness, death, personal taxes. (5W, Su) Lowe, Ivarie, Wiper

189. Principles of Business Education. The study of current problems in Business Education and a survey of the recent literature in the field. (8F) 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. (8Su 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. (8Su 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) Ivarie, Wiper

245. Cooperative Programs in Business Education. Workshop and research activities for the high school teacher supervising a work-experience program. (3Su) Wiper, Lowe

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. (8Su and as needed) Wiper

255. Office Technology. Adjustment to technological changes that are occurring in office occupations. A look at data systems, peripheral office equipment, and methods pertinent to curriculum improvement. (3Su and as needed) 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 selected issues, trends, and principles in Business Education. (1-6Su) Staff

271. Workshop in Business Education. Intensive one- to five-day workshop on pressing issues and trends in business education. (18Su) Staff

272. Workshop in Business Education. Intensive one- or two-week workshop on principles, issues and trends in business education. (28Su) Staff

273. Workshop in Business Education. A two-week workshop on current trends and issues applying to specialized or general fields in business education. (3Su) Staff

280. Seminar in Business Education. An analysis of research methods applicable to business education. (28Su 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, Sp, Su) Wiper

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

Distributive Education

Another curriculum leading to a teaching certificate is that of Dis-
tributive Education. This program is often referred to as marketing education in that it trains high school students and adults to become better salesmen and retailers through cooperative work experience programs in local businesses. Consult Dr. Calvin Lowe for full details.

The following are required for those interested in this field. Close cooperation is maintained between the Business Education Department, the College of Education, and the Vocational Division of the State Department of Education in providing the necessary course requisites in training a prospective teacher for this specialized profession.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 1</td>
<td>Introductory Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BA 2</td>
<td>Introductory Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BA 4</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BA 5</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BA 6</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BA 20</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BA 30</td>
<td>Business Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>BA 63</td>
<td>Salesmanship</td>
<td>2</td>
</tr>
<tr>
<td>BA 143</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>BA 147</td>
<td>Managing Small Business</td>
<td>4</td>
</tr>
<tr>
<td>BA 151</td>
<td>Marketing Principles</td>
<td>5</td>
</tr>
<tr>
<td>BA 156</td>
<td>Principles of Advertising</td>
<td>5</td>
</tr>
<tr>
<td>BA 161</td>
<td>Principles and Problems in Retailing</td>
<td>5</td>
</tr>
<tr>
<td>BA 171</td>
<td>Personnel Administration</td>
<td>5</td>
</tr>
<tr>
<td>BE 150</td>
<td>Philosophy of Distributive Education</td>
<td>3</td>
</tr>
<tr>
<td>BE 155</td>
<td>Methods of Teaching DE and Cooperative BE</td>
<td>3</td>
</tr>
<tr>
<td>BE 185</td>
<td>Managing Personal Finances</td>
<td>5</td>
</tr>
<tr>
<td>Econ 51</td>
<td>General Economics</td>
<td>5</td>
</tr>
<tr>
<td>Econ 52</td>
<td>Economic Problems</td>
<td>5</td>
</tr>
</tbody>
</table>

The following courses are strongly recommended, although not required, for Distributive Education majors:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 3</td>
<td>Introductory Accounting</td>
<td>3</td>
</tr>
<tr>
<td>OA 85</td>
<td>Office Data Systems</td>
<td>3</td>
</tr>
<tr>
<td>BA 183</td>
<td>Management Concepts</td>
<td>3</td>
</tr>
<tr>
<td>BA 140</td>
<td>Insurance</td>
<td>3</td>
</tr>
<tr>
<td>BA 141</td>
<td>Real Estate</td>
<td>3</td>
</tr>
<tr>
<td>Econ 127</td>
<td>Social Security</td>
<td>3</td>
</tr>
<tr>
<td>Speech 21</td>
<td>Intermediate Public Speaking</td>
<td>3</td>
</tr>
</tbody>
</table>

In addition, the following courses must be completed to qualify for secondary school certification in the State of Utah:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psy 53</td>
<td>Elementary General Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Psy 100</td>
<td>Human Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>Psy 106</td>
<td>Elementary Psychology for Student Teaching</td>
<td>3</td>
</tr>
<tr>
<td>PH 155</td>
<td>Public Health</td>
<td>3</td>
</tr>
<tr>
<td>ED 126</td>
<td>Principles of Secondary Education</td>
<td>3</td>
</tr>
<tr>
<td>ED 127</td>
<td>Secondary School Methods</td>
<td>3</td>
</tr>
<tr>
<td>ED 129</td>
<td>Student Teaching</td>
<td>5</td>
</tr>
<tr>
<td>ED 130</td>
<td>Student Teaching</td>
<td>4</td>
</tr>
<tr>
<td>ED 150</td>
<td>Organization and Administration</td>
<td>3</td>
</tr>
<tr>
<td>ED 161</td>
<td>Audio-Visual Education</td>
<td>3</td>
</tr>
</tbody>
</table>

BE 155 Methods of Teaching DE and Cooperative BE should be taken in the Junior year if student teaching is to be taken in the Fall of the Senior year. 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.

Students may count BE 155 toward the 33-credit professional certification requirement if needed.

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 completing all of the following courses in addition to University lower division group requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA 41</td>
<td>Elementary Typewriting or equivalent proficiency</td>
<td>2</td>
</tr>
<tr>
<td>OA 42</td>
<td>Intermediate Typewriting</td>
<td>2</td>
</tr>
<tr>
<td>OA 43</td>
<td>Advanced Typewriting</td>
<td>2</td>
</tr>
<tr>
<td>OA 65</td>
<td>Records Administration</td>
<td>3</td>
</tr>
<tr>
<td>OA 75</td>
<td>Shorthand I or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 76</td>
<td>Shorthand II or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 77</td>
<td>Shorthand III or equivalent proficiency</td>
<td>3</td>
</tr>
<tr>
<td>OA 92</td>
<td>Business Machines</td>
<td>2</td>
</tr>
<tr>
<td>OA 141</td>
<td>Dictation and Transcription I</td>
<td>5</td>
</tr>
<tr>
<td>OA 142</td>
<td>Dictation and Transcription II</td>
<td>5</td>
</tr>
<tr>
<td>OA 167</td>
<td>Office Practice</td>
<td>2</td>
</tr>
</tbody>
</table>

1Prerequisite to Psy 100 and Psy 106.
The following courses are strongly recommended, although not required, for Office Administration majors:

**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, Sp) **Staff**

42. **Intermediate Typewriting.** Assumes previous training in typewriting. Emphasis on skill building, typing of letters, envelopes, manuscripts, business forms and tabulation exercises. Prerequisite: OA 41 or equivalent. (2F, W, Sp) *Ivarie, Boyer*

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

45. **Remedial Typewriting.** Remedial typing, with emphasis on improvement of accuracy and speed. Enrollment limited to students typing less than 60 wpm. (1F, W, Sp) **Dunford**

65. **Records Administration.** Training in alphabetical, numeric, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters and cards. (3F, W, Sp) **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: OA 75 or equivalent. (3W, Sp) **Peterson, Olsen**

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

81. **IBM Keypunch Speedbuilding.** Three one-hour lab periods per week. Prerequisite: One year of typing. (1F, W, Sp) **Staff**

85. **Office Data Systems.** A survey of the development and contribution of better ways and means of keeping records as factors in providing information for management in its decision making. Intensive study of basic principles involved in data storage, processing, and retrieval by modern electric office equipment. (3F, W, Sp) **Staff**

92. **Business Machines.** Basic training in the use of ten-key adding-listing machines, printing calculators, and rotary calculators. (2F, W, Sp) **Boyer, 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: OA 77 or equivalent, and OA 42. (5F, 5W, 5Sp) **Olsen, Peterson**

167. **Office Practice.** Training in use of dictating and transcribing machines, photocopier equipment, varityper, and spirit, stencil and offset duplicators. Prerequisite: OA 42. (2F, W, Sp, Su) **Boyer, Lundstrom**

175. **Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager, types of organization, methods of control, office arrangement and equipment, job analysis, selection, employment and training of employees. Prerequisite: Economics 51, 52. (3F) **Ivarie, Neuberger**

186, 187. **Secretarial Procedures.** Office routines are studied, with special emphasis on
78 College of Business and Social Sciences

use of reference books, transportation and travel, use of telephone, telegraph, and cablegram services, financial records, writing for publication, minutes and meetings. (3W, 3Sp)

Lundstrom, Olsen

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. Completion of these requirements, in addition to University and group requirements, leads to a Bachelor of Science degree.

Office Administration Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA 42</td>
<td>Intermediate Type</td>
<td>2</td>
</tr>
<tr>
<td>OA 43</td>
<td>Advanced Type</td>
<td>2</td>
</tr>
<tr>
<td>OA 65</td>
<td>Records Administration</td>
<td>3</td>
</tr>
<tr>
<td>OA 85</td>
<td>Office Data Systems</td>
<td>3</td>
</tr>
<tr>
<td>OA 92</td>
<td>Business Machines</td>
<td>2</td>
</tr>
<tr>
<td>OA 141</td>
<td>Direction and Transcription I</td>
<td>5</td>
</tr>
<tr>
<td>OA 142</td>
<td>Direction and Transcription II</td>
<td>5</td>
</tr>
<tr>
<td>OA 167</td>
<td>Office Practice</td>
<td>2</td>
</tr>
<tr>
<td>OA 175</td>
<td>Office Management</td>
<td>3</td>
</tr>
<tr>
<td>OA 186</td>
<td>Secretarial Procedures</td>
<td>3</td>
</tr>
<tr>
<td>'BA 1</td>
<td>Introduction to Accounting</td>
<td>3</td>
</tr>
<tr>
<td>BA 4</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BA 5</td>
<td>Business Law</td>
<td>2</td>
</tr>
<tr>
<td>BA 20</td>
<td>Introduction to Business</td>
<td>3</td>
</tr>
<tr>
<td>BA 143</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>43</td>
</tr>
</tbody>
</table>

Family Life Courses

42 hours with not less than 9 in any department.

It is recommended that BA 2 also be completed—3 hours.

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT 10</td>
<td>Pattern Designing and Clothing Construction</td>
<td>3</td>
</tr>
<tr>
<td>CT 24</td>
<td>Introduction to Textiles</td>
<td>3</td>
</tr>
<tr>
<td>CT 106</td>
<td>Clothing Selection and Consumption</td>
<td>2</td>
</tr>
<tr>
<td>CT 106</td>
<td>Behavioral Science Aspects of Clothing</td>
<td>2</td>
</tr>
<tr>
<td>CT 120</td>
<td>Comparative Construction Techniques</td>
<td>5</td>
</tr>
<tr>
<td>CT 134</td>
<td>History of Textiles</td>
<td>3</td>
</tr>
<tr>
<td>CT 136</td>
<td>History of Costume</td>
<td>3</td>
</tr>
<tr>
<td>CT 140</td>
<td>Draping</td>
<td>3</td>
</tr>
<tr>
<td>CT 170</td>
<td>Flat Pattern Designing</td>
<td>3</td>
</tr>
<tr>
<td>CT 180</td>
<td>Tailoring</td>
<td>3</td>
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</tbody>
</table>

Family and Child Development

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCD 20</td>
<td>Preparation for Marriage and Family Relations</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td>FCD 120</td>
<td>Marriage</td>
<td>3</td>
</tr>
<tr>
<td>FCD 67</td>
<td>Early Childhood</td>
<td>3</td>
</tr>
<tr>
<td>FCD 68</td>
<td>Preschool Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>FCD 77</td>
<td>Child from 6-12</td>
<td>3</td>
</tr>
<tr>
<td>FCD 100</td>
<td>Human Growth and Development</td>
<td>3</td>
</tr>
<tr>
<td>FCD 108</td>
<td>Guidance of the Young Child</td>
<td>3</td>
</tr>
<tr>
<td>FCD 109</td>
<td>Play-School Education</td>
<td>2</td>
</tr>
<tr>
<td>FCD 115</td>
<td>Growth of the Infant</td>
<td>3</td>
</tr>
<tr>
<td>FCD 140</td>
<td>The Family in its Social Setting</td>
<td>3</td>
</tr>
<tr>
<td>FCD 150</td>
<td>Seminar</td>
<td>2</td>
</tr>
<tr>
<td>FCD 185</td>
<td>Family in Middle and Later Years</td>
<td>3</td>
</tr>
</tbody>
</table>

Food and Nutrition

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 22</td>
<td>Principles of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>FN 23</td>
<td>Laboratory of Nutrition and Food Preparation</td>
<td>3</td>
</tr>
<tr>
<td>FN 25</td>
<td>Meal Preparation for the Family</td>
<td>3</td>
</tr>
<tr>
<td>FN 107</td>
<td>Science in Relation to Food Preparation</td>
<td>3</td>
</tr>
<tr>
<td>FN 108</td>
<td>Science in Relation to Food Preparation</td>
<td>3</td>
</tr>
<tr>
<td>FN 109</td>
<td>Experimental Foods</td>
<td>3</td>
</tr>
<tr>
<td>FN 135</td>
<td>Weight Control</td>
<td>3</td>
</tr>
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<td>FN 140</td>
<td>Nutrition</td>
<td>4</td>
</tr>
<tr>
<td>FN 146</td>
<td>Food Technology</td>
<td>2</td>
</tr>
<tr>
<td>FN 150</td>
<td>Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Household Economics and Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEM 65</td>
<td>Housing</td>
<td>3</td>
</tr>
<tr>
<td>HEM 75</td>
<td>Home Furnishings</td>
<td>3</td>
</tr>
<tr>
<td>HEM 100</td>
<td>Household Equipment</td>
<td>3</td>
</tr>
<tr>
<td>HEM 140</td>
<td>Home Management</td>
<td>3</td>
</tr>
<tr>
<td>HEM 150</td>
<td>Home Management House</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td>HEM 151</td>
<td>Home Management Problems</td>
<td>4</td>
</tr>
<tr>
<td>HEM 155</td>
<td>Family Finances</td>
<td>3</td>
</tr>
<tr>
<td>HEM 160</td>
<td>Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>
The Department of Economics offers the Bachelor of Science, Bachelor of Arts, Master of Science and Master of Arts 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.

Economic Courses

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

52. Economic Problems. Continuation of Economics 51. The emphasis in this second course is on the economics of a competitive market; commodity markets and factor markets are analyzed. (5F, W, Sp, Su) 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

107. Micro-economic Theory. Theory analyzing the economic behavior of households and business firms within the framework of private capitalism. (4F, W) Durschi


125. Trade-Unionism and Collective Bargaining. Development, structure, function, government, and philosophy of trade unions in the 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. (3Sp, Su) Murray

135. Transportation Economics. The emphasis is upon railroad transportation in the United States. Economic principles that underlie rate structures and work of regulatory agencies. (3W) Israelsen

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

140. International Economic Relations. Basic economic relationship between industrial nations, trade restrictions, international debt and finance and means of promoting progress based on sound economics. (5Sp) Israelsen

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

150. Communist Economics. History and economic theories of Marxism, the organisation of Communist economies, and the economic policies and problems of Russia, China, and other Communist countries. (3Sp) Arrington

155. Public Finance and Fiscal Policies. Principles involved in establishing the general property tax, income tax, death taxes, taxes
upon business, social insurance taxes; effects of taxes in the American Economy; war and postwar finance. (3W) Israelsen

156. Special Problems in State and Local Finance. A critical examination of the tax structure of Utah and its ability to finance public services. Alternative sources of revenue and the school finance program will receive special consideration. (2W) Israelsen

155. Money and Banking. Development of our present monetary and banking system; a critical analysis of central banking. (6F, W, Sp, Su) Israelsen

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


174. Business and Government. The role of the giant corporation in modern economic life; public regulations of monopoly and competitive practices; international and domestic cartels; alternative policy toward business. (3F, Su) Arrington

175. Economic History of Far West. Development of agriculture, industry, transportation, and finance of the Far West with special attention to the economic development of Utah. (3 credits) Arrington

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

190. Introduction to Econometrics. Application of mathematics and statistics to the analysis of economic variables. (3F) Jensen


200. Thesis. Investigations by graduate students. Credit granted according to work done. (F, W, Sp) Staff

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

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. (2Sp) Staff

209. Problems in Economic Research. An intensive study of the methods, tools, and objectives of economic research: statistics, economic analysis, and economic history. Permission of instructor required. (3F) Arrington

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

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

213. Economic History Seminar. The methods and findings of economic history. In most years, attention will be focused on the economic development of the American Far West. (3) Arrington

See also History 186, Economic History of Latin America. (3W) Pratt
Department of

History

(History, Geography)

Head: Professor J. Duncan Brite
Office in Main 247

Professors S. George Ellsworth, Edwin L. Peterson, Joel E. Ricks, Emeritus; Associate Professor Brigham D. Madsen; Assistant Professors Stanford O. Cazier, Philip S. Spoerry; Instructors Douglas D Alder, C. Blythe Ahlstrom, Lucille Pratt, Emmett F. Stallings; Lecturer Serge N. Benson.

The Department offers programs leading to the Bachelor of Science, Bachelor of Arts, Master of Science, and the Master of Arts degrees in History.

Major in History. For a major in History the student must complete forty-five 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 4 and 5, and American History, History 20. History 190, Sources and Literature of History, is recommended for the Junior year and History 201, Historical Method, for the Senior year. Those who plan to obtain a teaching certificate should consult early, at least in the Junior year, with the College of Education to assure eligibility for teacher training and the right course program for certification. Those who plan to do graduate work in History are encouraged to complete at least two years of French and German or Spanish as an undergraduate.

History constitutes the major study in the subject matter of the Social Studies curriculum of the secondary schools. Those who plan to teach in the secondary schools should either (1) pursue work leading to the major in History and to the secondary certificate, or (2) pursue work leading to the teaching major in History and the secondary certificate. The former plan is regarded as preferable. The History faculty advises History majors; teaching majors may be advised by either the History faculty or the Education faculty.

A grade of “C” or better is required in any course in History which is used to meet the requirements for a major in History.

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 24 hours in a minor. History 4, 5, and 20 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 20, History 190, and either History 1, 2, and 3, or History 4 and 5, are recommended. A
82 College of Business and Social Sciences
member of the History faculty will
be pleased to advise concerning the
minor.
College Teaching. There is an
increasing demand for college and
university history teachers. Students of capacity and dedication
are encouraged to give serious consideration to this profession. Appointment to a major college department usually requires the PhD
degree. Interested students should
consult History faculty members,
and check on fellowships and assistantships.

Institute of Utah Studies
By virtue of its Library holdings,
its faculty, and research programs,
Utah State University is a leading
center for the study of all phases of
Utah's historic and contemporary
development.
The Institute of
Utah Studies has been established
for the purpose of collecting and
preserving the written and oral record of Utah's distant and recent
past, of training persons in the use
of the sources and literature of
Utah history, and encouraging and
assisting all persons, especially
teachers and research writers in
the social sciences and humanities,
in the detailed study of any and all
phases of Utah's development, and
of offering courses and seminars in
regular history. The Institute appeals especially to teachers desiring to specialize in the teaching of
Utah history and to writers of historical and analytical studies of a
regional nature. Students with this
interest should give special attention to History 135, 137, 226, and
237. Director of the Institute of
Utah Studies is S. George Ellsworth.

Graduate Study
Master of Science or Master of
Arts in History. Program>~ for

either of the Master's degrees are
described in the Catalog of the
School of Graduate Studies. Those
who are interested in these programs should obtain a copy of the
Graduate Catalog and consult with
a member of the History faculty.
American Studies. The Department of English and Journalism
and the Departments of History
and Political Science cooperate in
administering the graduate program leading to the Master of Science and the Master of Arts degrees
in American Studies. See the catalog section on English for a statement of that program.

History Courses
Basic Lower Division
1. Man and Civilization I. A survey of the
major civilizations of the world, with emphasis on the European tradition, primarily con·

cerned 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 1600. Not open to
those who have had History 4. (3F)
Staff
2. Man and Civilization II. Continuation of
History 1. From about 1600 to 1860.
Not
open to those who have had History 6. (3Wl
Staff
3. Man and Civilization III. Continuation of
History 2. From about 1860 to the present
day. Not open to those who have had History
5.
(3Sp)
Staff
4. World Civilization I . The cultural history of the world from earliest times to about
1600. A more detailed course than History
1. Not open to those who have had History 1.
(6F, W)
Alder
5. World Civilizations II.
Continuation of
History 4. From about 1600 to the present
day. Not open to those who have had History 2 or 3. (6F, W, Sp)
Brite, Alder
20. American Civilization.
A basic onequarter course in the fundamentals of American history.
Successful completion of this
course meets the requirements established by
SB 39. (6F, W, Sp)
Staff

21. Latin America to 1800. Geography, preColumbian peoples, exploration and conquest
and colonization by European powers, international rivalries, political, social, and economic developments, dive rgence between national and colonial viewR. (oF)
Pratt


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. (6F) 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. (3Sp) Brite

123. Germany Since Napoleon. (3F) Alder

124. Renaissance and Reformation. (1250-1600) (5F) Brite

125. Absolute Monarchies. (1589-1789) (3W) Brite

126. French Revolution and Napoleon. (1789-1815) (3Sp) Brite

127. Nineteenth Century Europe. Political and economic developments between 1815 and 1914. (3Sp) Brite

128. Twentieth Century World. Political and economic developments in Europe, America, Asia, and Africa since the end of World War I. (3Sp) Alder

135. History of the Far West. Deals with the region from the Rockies to the Pacific Coast, with emphasis upon the Intermountain West. (5F) Madsen

139. History of the Soviet Union. From the Revolutions of 1917 to the present day. (3W) Spoerry

141. American Colonial and Revolutionary History. Political, economic, and cultural history of the founding and development of America and the causes and effects of the American Revolution (1429-1787). (5F) Madsen


144. Civil War and Reconstruction. (3Sp) Cazier

145. Rise of Modern America. (1877-1900) Political, economic and cultural developments; reform movements; and foreign affairs from the Reconstruction period to the establishment of the United States as a world power in 1900. (3F) Ahlstrom

146. The Progressive Era. Emphasis on political, economic, and social reforms from the turn of the century to the 1920's. (1900-1920's) (3W) Ahlstrom

147. Recent America. Domestic and foreign affairs of the United States since World War I, emphasizing the development of modern America and her role in world affairs. (1920-present) (3Sp) Ahlstrom

155. Cultural History of the United States. A social and intellectual history of the United States with emphasis on the development of major thought patterns in relation to their social-economic context. (5W) Cazier

156. Cultural History of the United States I. A social and intellectual history of colonial America with emphasis on the development of major thought patterns in relation to their social-economic context. (3F) Cazier

History of the United States and Latin America

134. The Development of the American Frontier. From English, French, and Spanish beginnings along the Atlantic to the occupation of the Great Plains. (1492-1848) (3W) Madsen

158. Cultural History of the United States III. A social and intellectual history of the United States in the twentieth century. (3Sp) Cazier

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

173. Immigration to the United States. Survey of causes of emigration, the voyages, and initial reception within the United States, emphasizing the immigration from Europe. (3Sp) Pratt

184. History of Mexico. The social, economic, and political history from colonial times to the present, with major emphasis on the national era. (3W) Pratt

185. History of United States-Latin American Relations. The diplomatic, economic and cultural relations between the United States and the twenty Latin American nations. (3Sp) Pratt

186. Economic History of Latin America. The economy as it developed in colonial days, the economic problems of the new nations in the 19th century, the push to industrialize as well as maintain raw material production in this 20th century, the need for capital investment and government and international efforts to provide this. (3W) Pratt

190. Sources & Literature of History. European, Asian, and American studies. For all persons preparing to teach or write history. Recommended to history majors in their Junior years. (3F, W, Su) Ellsworth, Alder

See also Economics 170—Economic History of the United States. (6W) Arrington

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, Sp) Staff

203. Historiography. The history of historical writing. (3W) Madsen

205. Philosophy of History. Interpretations, causation, and interrelations in history. (3F) Cazier

222. Seminar in European History. (3W) Alder


226. Seminar in Western American History. (3W) Staff

228. Seminar in Latin American History. (3Sp) Pratt

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 & Conference in Special Areas. Credit Arranged. (F, W, Sp) Staff

298. Thesis. Credit arranged. (F, W, Sp) Staff

Geography Minor

The Department offers a Geography minor which can be obtained by passing the following courses: Geography 5, 6, 7, 105, 106, 107; Geology 1 or 3.

Geography Courses

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

5, 6, 7. General Geography. Europe, Afro-Asia, and the Americas. A survey of geography with emphasis on the social viewpoint. The Influence of geography on domestic and international problems: cultural, ethnic and linguistic backgrounds, boundaries, population trends, national economic and governmental systems as they may reflect foreign policy. Students may register for one, two or three quarters. (3F, W, Sp) Peterson

30. World Regional Geography. A survey of the regions of the earth with emphasis upon the study of the relations of human activities to natural environmental conditions of countries and continents. (3F, W) Stallings

100. Teaching of Geography. A course designed to assist the classroom teacher in the presentation of geographic information. Techniques, methods and sources of data will be stressed. (3W) Stallings

105, 106, 107. Geopolitics: Europe, Afro-Asia and the Americas. A more detailed study of the areas under consideration with special attention directed towards the political and cultural backgrounds of the people. Emphasis will be placed upon the historic development of the regions in light of their position in the modern world picture. (3F, W, Sp) Peterson

130. Geography of Underdeveloped Lands. A geographic analysis of underdeveloped and emergent countries in terms of internal and external problems and interrelationships. (3Sp) Stallings

135. Physical Geography of the World. An approach to geography from the physical viewpoint with an emphasis on those aspects of the physical environment that are most im-
important to man. Areas covered are weather, climate, landforms, seas, water resources, natural vegetation and associated animal life, soils, mineral fuels, and minerals of economic importance. An analysis is made of the advantages and disadvantages presented by these factors to man’s use and potential use of them. (5F, W, Sp) Stallings

145, 146, 147. Economic Geography. Europe, Afro-Asia, and the Americas. A regional study of economic relationships between geographic areas. Examination will be made of basic patterns of trade relations, population distribution, capital equipment, governmental agencies which affect production and trade and international relations. (2F, W, Sp) Benson

150, 160, 170. Geographic Tension Areas. An analysis will be made of current areas of the world in which racial, economic, political or religious tensions appear. The geographic location of the areas will be examined and the spatial relationship of the regions concerned studied. Historic, social and linguistic patterns of the areas will be noted to better interpret the causes for current tension. (3F, W, Sp) Peterson

Department of

Political Science
(Political Science, Pre-Law)

Head: Professor M. Judd Harmon
Office in Main 250

Professors Wendell B. Anderson, Claude J. Burtenshaw, M. R. Merrill, University Vice President; Associate Professor Milton C. Abrams; Assistant Professors JeDon A. Emenhiser, Philip S. Spoerry.

The Department offers the Bachelor of Science, the Bachelor of Arts, Master of Science, and Master of Arts degrees in 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 National Government. Students must have grades of "C" or above in all courses counted toward the major, and a 2.5 grade average in the major field is required for graduation. Before being certified for graduation by the Department the student must pass a comprehensive examination in the field. Students will be notified of the time and place of examinations.

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

Career Opportunities in Political Science

One of the most important reasons for studying Political Science is to improve the quality of one’s citizenship. An informed citizenry is essential in a democracy. However, in these days there are a number of career opportunities for those who major in the field. These include teaching in the secondary schools, journalism, and business. There is also a demand for college teachers. The latter requires graduate work usually to the PhD level.

In addition the Department of Political Science offers career-oriented programs in International
Relations, Public Administration, and Pre-Law.

International Relations

The hopes and fears of our civilization are now focused on International Relations. Unusual career opportunities are available for those possessing the requisite aptitudes and training. The United States Department of State and particularly the Foreign Service offers a wide range of opportunities. Private American businesses are expanding foreign operations and international trade. These companies constantly seek qualified personnel. It is recommended that students contemplating an International Relations specialty become proficient in at least one foreign language. Students having a special interest in this area are invited to join the International Relations Club.

Public Administration

The career opportunities for persons trained in Public Administration include management positions in city, county, state, national, and international agencies. Administrative positions in finance and personnel are both rewarding and challenging.

Pre-Law

Utah State University has been very successful in preparing students to enter professional law schools. The success of these students both in the professional training period, and thereafter, indicates the high quality of the preparation.

Some law schools admit only college graduates. Others admit students with 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 Library 239.

Following is a recommended curriculum for Pre-Law students. This has been carefully prepared to conform to the recommendations of the law schools themselves. Some modification is possible. Pre-Law students should register with a member of the Political Science staff.

Recommendations for Pre-Law Majors

**American Institutions:** PS 10 is required. Optional selections from the following: PS 15, 125, 140, 151, 180, 181, 182, 207, 208, 209. Total minimum hours—12.

**Comparative Government:** Optional selections from the following: PS 70, 170, 171, 172, 173, 174, 175, 176. Total minimum hours—3.

**International Relations:** Optional selections from the following: PS 101, 102, 111. Total minimum hours—3.

**Political Thought:** Optional selections from the following: PS 117, 118, 119, 145, 146, 147. Total minimum hours—7.

**Public Law:** Optional selections from the following: PS 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, Sociology, and Economics. Prospective lawyers should be reasonably skilled in typing and familiar with accounting procedures.

Students contemplating law as a potential career are invited to affiliate with the Pre-Law Club. Professor W. B. Anderson is adviser.
Graduate Study

Master of Science and Master of Arts in Political Science. The program of studies for the Master of Science and Master of Arts degree in Political Science is described in the Catalog of the School of Graduate Studies. Students interested in the program should obtain a copy of the Graduate Catalog and must also consult with a member of the Political Science faculty.

Political Science Courses

1. Government and the Individual. Introduces the student to the political world of American democracy. Totalitarian governments and the philosophies of 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. (3F, W, Sp) Emenhiser, Merrill

10. American National Government. The basic course of the department. It is highly desirable that this be taken before upper division courses in Political Science. (6F, W, Sp) Staff

15. American State and Local Government. The emphasis is on Utah state, municipal and county government. It follows American government. (3F, W, Sp) Emenhiser

70. Comparative Political Systems. Introduction to the field of comparative government and politics, with emphasis on constitutional and totalitarian regimes, presidential and parliamentary structures, and one-, two-, and multiparty systems. Prerequisite: PS 10 or departmental permission. (3F) Spoerry

91. 92, 93. Public Affairs Series. Those assemblies, forum and other campus events relating to public and international affairs are included in the series. Students will be expected to attend and report and evaluate six scheduled events. Passing rather than letter grades will be given. Series conducted in cooperation with Associated Students. (1½F, ¹⁄₂W, ¹⁄₂Sp) 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) Anderson

102. International Political Relations. Psychological, economic, racial, and other obstacles to international cooperation, as exemplified in recent events. Attention is given to various proposals that attempt to solve the dilemmas of our time. (3W) Merrill

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

111. International Government. The purpose, organization and operation of the United Nations and the Atlantic Community are studied. (3 Sp) Anderson

114. International Relations. Studies the relations between and among the various units of government in the United States including nation, state, county, city, and district. (3Sp) Emenhiser

115. Problems of Utah Government. Examines contemporary problems of Utah at the state, county, and city level, as well as federal-state and interstate relations. Special emphasis is given to natural resource problems. (3W) Emenhiser

117. 118. 119. American Political Thought. A survey of American political ideas and the men who developed them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present. 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, 2 Sp) Harmon

123. Political Surveys. Introduces the student to the tools of political field research and stresses the analysis of voting behavior by utilizing census data, election returns, and questionnaires. (3W) Emenhiser

124. Public Opinion and Policy Formulation. Discusses the nature of public opinion and propaganda and their role in the political process. Assigns research topics on particular current policy developments and assists the student in attempting to determine the effects of public opinion upon governmental policy decisions. (3Sp) Emenhiser

125. Political Parties and Practical Politics. Organization and practices of political parties. (5W) Emenhiser

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

129. International Law. A basic course in the law of nations. Students should have had at least one course in international relations or foreign policy. (5W) Anderson

131. Administrative Law. Constitutional limitations, legislative supervision, and judicial control of administrative agencies, and the forms of administrative action appropriate for American economic and political institutions. (3Sp) 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) Emenhiser

145, 146, 147. History of Political Thought. Course 145 covers political thought from its beginnings in the Greek period to the Reformation. Course 146 carries on the study to Hegel. Course 147 is devoted to the modern period and emphasizes a comparative study of socialist, communist, nazi-fascist, and democratic thought. (3F, 3W, 3Sp) Harmon

151. Introduction to Public Administration. Defines the subject matter of public administration, concentrates upon analyzing the problems of governmental administrative organization and management, and explores the methods of securing responsible performance from the bureaucracy. (8F) Staff

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)

153. Public Finance Administration. Describes national, state, and local governmental budgetary and accountability processes in relation to policy formulation. Prerequisite: Political Science 151. (2Sp) Staff

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

159. Ethics of Society and Law. This course deals with the problems of knowing, free will, sources of morality, and the morality of law. (SF) Burtenshaw

160. Theory and Practice of Government. Designed to satisfy the demand for an offering in general government on the upper division level for non-political science majors, particularly those in education, forestry, and the exact sciences. The course will deal with the important theories underlying the various governmental forms and with the practical operation of government. The emphasis will be on the national government of the United States. (SF, W, Sp)


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. (5W) Spoerry

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

174. Politics of the Communist Bloc. Relations between Communist and Soviet bloc governments, including the USSR, Communist China, and Eastern Europe. (3Sp) Spoerry

175. Political Systems in South and Southeast Asia. Politics and government in India, Indonesia, Burma, Philippines, and other countries in the area. (3W) Spoerry

176. Politics of Underdeveloped Areas. Characteristics and problems of the political systems of the non-Western world, including Asia, Africa, and the Middle East. (3W) Spoerry

177. Today's Critical Latin American Problems. Topics will vary as crises develop, dealing with background and development of each crisis from national, political, economic, or social views. (2F) Pratt

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

190. Problems in American National Government. The student enrolling in this course should have some basic knowledge of the structure of the American national government. Political Science 190 will consider the government in operation and some of the problems which grow out of that operation. Particular emphasis is on the relations between the three branches of government. (SF, W, Sp)

201. Research in Political Science. Credit arranged. (F, W, Sp)

203. Readings and Conferences. Credit arranged. (F, W, Sp)

205. Methods in Political Science. Methods of 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.

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, 2Sp) Staff
211. Thesis. For graduate students preparing a master's degree thesis. Credit arranged. (F, W, Sp) 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

Department of

Sociology, Social Work, and Anthropology

Head: Professor R. Welling Roskelley
Office in Main 230


Instructional and Occupational Opportunities

Instruction in Sociology, Social Work, and Anthropology contributes to students in two important ways.

First, it provides a broad or general perspective about man. This perspective is developed through examination of the general features of cultural and social life of man in complex civilization, and of man in pre-historic, primitive, and less technologically developed societies. This approach leads to better understanding of the processes and principles of social life that are alike and that are different from one part of mankind to another. This helps the student see himself, his groups, and his society in a meaningful relationship to others.

Secondly, instruction in these fields prepares the student for varied occupations in fields of teaching, research, administration, and social welfare. Teaching positions are largely at the junior high and high school levels, and with more advanced training on the college level. Teaching positions in the public schools are usually integrated with history; thus a strong minor in history is encouraged for those who seek these teaching positions.

Research is another occupational outlet. Opportunities to do research exist in industry, government, private and public agencies, and in educational organizations. These positions usually require some graduate training. Because of the need for qualified research people in Sociology and Anthropology, graduate schools compete heavily with scholarships, assistantships, and fellowships to attract students with training in these fields.

Administration, particularly when associated with fields where management of people is crucial, has many and varied openings for persons with training in Sociology, Social Work, and Anthropology.

The human and organizational aspect of administration is extremely vital, and training in subjects that provide knowledge and understanding in these areas is in demand.
Social welfare positions, both public and private, are widely available. These positions are variously referred to as social worker, case worker, probation and parole officer, child welfare worker, psychiatric social worker, employment officer, etc. Those whose training has focused in social work have significant opportunities here. In the social work field there is a great demand for students who seek graduate training. Financial aid to such students is generally available.

Sociology

A major in Sociology must, in addition to meeting the group requirements for graduation, complete a minimum of 47 credits in Sociology. A number of courses in Anthropology are included in the Sociology group. 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 redirect 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, Sp) Staff

75. Effective Community Living. Understanding the community we live in. Practical experience in learning fundamental tools for social action by individuals, organizations, and groups. (3Sp) 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

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. (3Sp) Roskelley

144. Woman Today. The new and challenging roles of women in adjusting to a modern society. (3Sp) Staff

145. Alcoholism. See HPER 145. (3Sp) 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. (3F) DeHart

159. Industrial Sociology. To stress the contributions of sociology to the understanding of industry as a social system. Includes work behavior of individuals and consideration of the impact of technological change on the community and larger society. (3Sp) DeHart

160. The Family in Various Cultures. Historical and institutional approaches to family functions; analysis of comparative family systems; family theory and ideological considerations. (8F) Keller


170. Intermediate Sociology. Basic principles of sociology are considered in their theoretical and methodological settings, as a body of facts, a method of investigations, 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


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

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

196. Race Relations. Historical perspective of race relations as they have existed in the United States and other parts of the world. Critical examination of the implications which these relations have for the institutionalized and social life in the United States. Analysis of current aspects of integration vs. segregation as they affect individuals and groups in our present day society. (3) Pennock

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, Sp) Staff


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

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

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

225. Sociology of Deviant Behavior. Deviant Behavior may be antisocial and not criminal or criminal and not antisocial. Research in depth to give the student greater insight and perspective to the social implications implicit within this concept (3) Pennock
287. Methods of Social Research. Historical development of Social Research. Methods and techniques of interpreting data in social analyzing, and interpreting data in social research. (3F) Roskelley

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

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 undergraduate departments of Social Work have been approved for constituent membership in the Council on Social Work Education, of which this Department is a charter member.

Course requirements for a major leading to a BS degree in social work include: 47 credit hours selected from courses in social work, sociology, psychology, economics, and political science. Major professors will aid in their selection. SW 173 is a suggested prerequisite to other social work courses.

In addition to the minimum 47 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

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

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

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. (3Sp) Lewis

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

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

175 a, b, c. Introduction to Field Work. Various agencies dealing with social work and related areas. Includes field trips. (Taken concurrently and immediately following SW 173.) (2 cr. each) 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. Lewis
198. Corrections. Historical perspective of crime and punishment as contrasted with modern concepts of penology which looks at the penitentiary as an institution of rehabilitation and resocialization of the juvenile and adult offender. (3) Pennoek
199. Public Welfare. Examination and evaluation of public and private welfare programs including the program of the Department of Health, Education and Welfare as it applies to unemployment, old age assistance, aid to needy children, and physically or mentally handicapped. (3) Pennoek

Anthropology

Anthropology offers the widest possible framework for the understanding of man and society through courses dealing with the present diversity of cultural and human types as well as prehistoric evolutionary perspectives. The study of Anthropology provides a useful background for students in the social sciences, humanities, biological sciences, and education. It leads, when pursued through graduate levels, to careers in research, teaching, and some branches of government service.

Anthropology Courses

90. Introduction to Cultural Anthropology. Nature and evolution of man and his social and cultural behavior. Using empirical data from prehistoric, primitive, and contemporary cultures, current ideas and generalizations about human behavior are explored. (5) Keller
92. Peoples and Cultures of the World. Intensive comparison of the economic, political, kinship and religious structures of representative societies from the major culture areas of the world. (3) Keller
95. Human Pre-History. Evidence discovered through research of man’s existence upon the earth before the period of written history. (3) Keller
105. Anthropology and Education. Theoretical and illustrative contributions of anthropology to a broad perspective on the variability of the educational processes and objectives in various primitive and complex societies over the world. (3) Keller
106. Comparative Family Systems. Basic anthropological concepts and theories relating social structure based on kinship, its analysis, evolution, functions, change, and variability over the world. (3)
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. (8Sp) Roskelley
166. American Indian Ethnology. Economic, political, and religious structures of representative aboriginal cultures of the main culture areas of North America Indian. Emphasis will be given to prehistoric peoples of the local Great Basin area. (3) Keller
167. North American Prehistory. Analysis of man and cultural evolution in the major culture areas of prehistoric America. Includes archeological laboratory and field methods with investigations of local sites. (5) Keller
268. Independent Studies in Anthropology. Advanced readings or projects relating to theory, field or laboratory studies arranged by student and staff. (Credit arranged.)

Division of

Military and Air Sciences

Dr. Edwin L. Peterson, University ROTC Coordinator
Colonel Bert Perrin, Professor of Military Science
Lt. Col. David A. Mayo, Jr., Professor of Air Science

Each male citizen of this country has an obligation to serve in the military forces when required for the defense of his nation. The
Reserve Officers’ Training Corps program is one of several ways by which this obligation can be fulfilled. Through the ROTC program, America offers outstanding college men a pathway from campus leadership to important command responsibilities as officers with the Active or Reserve Military forces.

Two separate ROTC units are located at Utah State University: Army and Air Force. Men may initially choose which program they wish to enter; however, subsequent transfer between units is not generally approved because of the difference in curriculum.

*Army and Air Force ROTC consist of a two and a four year program.* Army and Air Force ROTC four-year programs consist 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 Army and the Air Force ROTC two year programs are designed for students who come to Utah State University from other institutions, to include junior colleges, where ROTC was not offered as part of the curriculum or for those students of Utah State University who were unable to take the basic course because of scheduling difficulties.

Students who elect the two year program will be required to attend a six weeks summer camp before enrolling into the Army or Air Force Advanced Course.

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 or basic summer camp is a prerequisite for entrance into the Advanced Course unless constructive credit is granted for previous active military service.

Satisfactory completion of either basic camp or a basic summer camp of at least six weeks duration or the Basic Course and Advanced Courses, including the summer camp, leads to a commission as a Second Lieutenant in the Army or Air Force Reserve. Outstanding students in both programs are designated Distinguished Military Students and are afforded the opportunity of applying for commissions in the regular service.

Deferment from the draft is offered to selected students who maintain satisfactory grades in ROTC. Upon completing the program and being commissioned, students normally enter on active duty with the Armed Forces as a second lieutenant in the service in which they are commissioned. The period of active service required of ROTC graduates depends on the requirements of the service concerned.

*Enrollment Regulations.* ROTC leadership, drill and command periods are an integral part of the ROTC program. Registration for one of these periods is required of all ROTC students. 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) Six-week Officer Basic Military Summer Training:
(1) Have two academic years remaining.
(2) Be a citizen of the United States.
(3) Selected for Advanced Program.

(C) Advanced Courses:
(1) Satisfactorily complete the basic course, have equivalent credit.
(2) Accept and sign a draft deferment agreement and agree to stipulations of the Advanced Course contract, outlining the obligations of both the student and the service.
(3) Have high moral character.
(4) Obtain a satisfactory score on the Army or Air Force Qualification Test.
(5) Be selected for enrollment into the Advanced Course by a selection board composed of officers and civilian faculty members. Selection is based on academic standing, previous 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 Bachelor's degree. It is desirable, but not required, that a student complete the ROTC program and the requirements for a degree simultaneously.
(7) Enlist in a reserve component for a period required by the Secretary of the service concerned. (The student will not be required to become a member of a local unit nor attend weekly drills.)

ROTC Band. There is 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 Team to promote marksmanship among Army and Air Force cadets. The Company competes in several regional and national invitational tournaments. The Pershing Rifle Drill Team 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.

Association of the United States Army. A national professional organization dedicated to the improvement of military-civilian understanding. It is open to all members of the Cadet Corps. The Association of the United States Army serves as a means whereby Cadets find incentives for increasing their military skills, attend meetings that will add to their gen-
eral military background, and acquire information about the place of the military in the defense of the nation.

ROTC Band Courses

IB, 2B, 3B. ROTC Band. First Year. Staff
4B, 5B, 6B. ROTC Band. Second Year. Staff

Department of

Air Science

Head: Professor Lt. Col. David A. Mayo, Jr.
Office in Military Science 107

Assistant Professors Major John E. Jarrell, Captains Gaylord A. McCallson, J. G. Poulson.

The purpose of Air Force ROTC is to provide education that will develop skills and attitudes vital to the career professional Air Force Officer; to find and interest capable young college men to apply for Air Force Officer training; to screen and select them in desired numbers and categories to meet Air Force needs; and to perform these functions in a way to motivate these men to enter the military profession on a career commitment. It is not the purpose of the course to train in a specific field, but rather to give an understanding of the mission and the global responsibilities of the United States Air Force. The academic phase develops a background in national and international affairs to help interpret and evaluate world events.

Summary of the AFROTC curriculum. The AFROTC teaching methodology is based on the seminar and independent study methods of the graduate school. Professional officer preparation is achieved by active participation of the cadet in a learning situation which parallels, in many respects, the activities of an Air Force officer, through discussion, conference, and coordination actions leading to decision making. The curriculum has been designed to meet the following criteria: college level in content, scope, intensity and presentation; appeal to students in all academic fields; and preparation of students to undertake flying training upon graduation.

The Four-Year Program

Study is divided into the General Military Course (GMC), covering the first two years, and the Professional Officer Course (POC), covering the Junior and Senior years plus a four weeks summer training. The course consists of instruction totaling 420 hours, allocated as follows: Freshman and Sophomore - 90 each; Junior and Senior years - 120 hours each and summer training, four weeks.

Screening of candidates for the two year program will conform to the same requirements for selecting advanced students in the four-year
program. Prior to formal enrollment each student must be eligible and successfully complete six weeks of field training (Field Training Course AS 250.) The course of instruction is the same required of the four-year program with the basic program covered in the six weeks of field training. Each cadet has the privilege of choosing whether to participate in the second (four-week) summer training period during his collegiate program or at the first opportunity after graduation.

OE 100, the Freshman course explores the causes of present world conflict as they affect the security of the United States. The Sophomore course, OE 200 is a comparative study of world military forces. These two courses constitute the General Military Course.

The Junior year. OE 300 deals with the development of air power, astronautics and space operations, and future developments in Aerospace power. The Senior course, OE 400 provides a study of professionalism, leadership and management. The focus of the Advanced Course is on the mission environment and personal identification of the cadet with his career.

In addition the curriculum includes: experiences designed to stimulate and develop a growing interest in Air Force flight training program (e.g., orientation flights and visits to Air Force Bases); opportunities to apply the principles of leadership, management and staff work in practical situations, and other related experiences.

Physical Requirements

All cadets must meet the physical standards for general military service. A cadet’s physical examination for entry into the University will generally determine whether or not he meets these requirements.

Veterans

A veteran is accepted into the AFROTC program if he can complete the program prior to reaching age 30, provided he has completed at least two years active duty and can meet the physical requirements. Parts of the General Military Course may be waived in lieu of prior military service. If accepted he can participate in the flight indoctrination program in the Senior year, provided he will be commissioned before age 26 1/2 years.

Special University and AFROTC Requirements

Once a student enters the General Military Course or the Professional Officer Course, successful completion of the course becomes a requirement for graduation, unless relieved of the requirement by the Professor of Aerospace Studies or the President of the University. In addition, when entering the Professional Officer Course, a student must agree to accept an Air Force Commission if it is offered and to serve on active duty if directed to do so.

Upon initial enrollment at the University, Aerospace classes should be scheduled to be completed simultaneously with requirements for a degree. If the student is an engineer under a five-year program, he should plan his Aerospace program in advance with his adviser and the AFROTC Director of Training in order to meet the above requirements.

To qualify as a pilot or navigator, cadets must be able to finish the Aerospace program and graduate from the University before age 26 1/2 years. Other cadets must complete the military program and graduate from the University prior to reaching the age of 28, unless they are veterans.
Regular Commissions in the United States Air Force. Outstanding AFROTC Cadets who have demonstrated a high degree of leadership, initiative, and an interest in a career as a regular officer and are designated a Distinguished Military Graduate may be offered an opportunity to apply for a regular Air Force Commission.

Payments to Advanced Cadets. The advanced cadet is paid a retainer fee of $40 per month, maximum amount paid for Junior and Senior years is $800. Cadets will be paid approximately $120 for the six weeks Field Training Course and $120 for the four weeks Field Training Course plus travel pay for the round trips to and from camp.

Summer Training

(a) Field Training Course (AS 250) is a prerequisite for cadets entering the AFROTC at the Junior level without the basic courses. Training will be given at an Air Force base and will last for six weeks.

(b) Field Training Course (AS 350): All advanced cadets will attend one summer training camp of four weeks in duration. Normally, attendance to this camp is between the Junior and Senior years at a selected Air Force Base. Six quarter hours of college credit are granted for this training.

Flight Training. AFROTC is concerned with two types of flight training; the first type is taken while a student is a cadet at the University and the other after he has received a commission and has graduated.

Cadets designated potential pilots are required to register for the AFROTC Flight Instruction Program (FIP) during their Senior year. Successful completion of 36½ hours of flight instruction and a FAA examination enable him to gain three 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 $6,000.

Non-Flying Cadets. To meet the challenge of the Aerospace age, its technological advances and its ever broadening horizons, officers possessing a variety of skills are required within the Air Force. These skills cover the exact sciences and social sciences but are not limited to these study areas. In many of these fields cadets may be granted a year’s delay to acquire an advanced degree prior to call to active duty. After their call to active duty they will serve four years in major fields of study. Interested cadets may contact the AFROTC Education and Training Officer for information of the Air Force specialist fields related to their academic major.

Delay of Entry on Active Duty. If cadets complete the AFROTC program and receive commissions they may request a delay in call to active duty if they desire to continue studies toward a Master or Doctor’s degree. The length of the delay depends upon current AFROTC regulations and directives. Students who are slated for flight training, however, must enter such training before reaching 26½ years of age.

Texts and Uniforms. All texts and uniforms are furnished at no expense to the student.

Air Force Library. A library of Air Force periodicals and publications is maintained for the Air Force ROTC Cadet. Material relative to
the AFROTC curriculum is available.

**Air Force ROTC Counseling Service.** AFROTC Detachment maintains counseling services for each cadet. Service is offered primarily in areas concerned with the AFROTC curriculum (Education, study and leadership).

**Air Force Angel Flight.** The Angel Flight is an AFROTC-sponsored organization of approximately 30 University women chosen by a composite board of judges. Former members of Angel Flights recognized by National Headquarters may transfer upon application. Applications for membership may be made by University women, except second and third quarter seniors. The purpose of the Angel Flight is to provide the University with an AFROTC Women's social auxiliary and to further the course of the U. S. Air Force by promoting the interest of college students in the AFROTC Program.

**Angel Flight Courses**

**AS 61, 62, 63. Aerospace Studies Angel Flight, Freshmen.** A course in leadership management and organization including drill and classroom activities for University women selected for membership (1F, 1W, 1Sp) **Staff**

**AS 64, 65, 66. Aerospace Studies Angel Flight Sophomores.** (1F, 1W, 1Sp) **Staff**

**AS 161, 162, 163. Aerospace Studies Angel Flight, Juniors.** (1F, 1W, 1Sp) **Staff**

**AS 164, 165, 166. Aerospace Studies Angel Flight, Seniors.** (1F, 1W, 1Sp) **Staff**

**Sabre Squadron**

**AS 14 and 24 Sabre Squadron is an honorary society for first and second year AFROTC cadets. Its purpose is to foster esprit-de-corps among Freshmen and Sophomore cadets; to promote American citizenship; to provide leadership experiences; to promote air power concepts; to offer service to Utah State University; to increase cadet knowledge of the mission and scope of the United States Air Force. Sabre drill is required.**

**AEROSPACE STUDIES OE 100 FIRST YEAR GENERAL MILITARY COURSE**

**AS 11.** An introductory course exploring the causes of present world conflict as they affect the security of the United States. The factors of national power, the types of conflicts nations will practice to achieve their goals. Two class periods per week and one leadership drill per week (2F) **Poulson**

**AS 12. Democracy and Communism.** A comparative survey of the theory and practice to develop an understanding of opposed ideologies and their relevance to the cold war. Two class periods per week and one leadership drill per week. (2W) **Poulson**

**AS 13. Aerospace Power Orientation.** An introduction to contemporary aerospace equipment, weapon systems and their employment trends in the development and the impact of these trends on world affairs. Two class periods per week and one leadership drill per week. (2Sp) **Poulson**

**AEROSPACE STUDIES OE 200 SECOND YEAR GENERAL MILITARY COURSE**

**AS 21, 22 and 23. World Military Systems.** A comparative study of world military forces including Free World Land and Naval Forces, Western Alliances, Communist Military Systems, and trends in the development and employment of military power. Two class hours and a leadership laboratory period of one hour per week each quarter.

**AS 21. Free World Land and Naval Forces.** Compares the roles, missions, and objectives of each service. Shows that the roles assigned to each force are those which best fit the nature of each service and complement the roles of the other. The course will include a general knowledge of the weapon systems and
their employment, an awareness of the trends in the development of land and naval equipment, and the changing concepts of the force employment. (2F) Maj. Jarrell


AS 23. Western Alliances and Trends and Implications of World Military Power. A study of the Western Alliances and the reasons for their existence. Shows the political, economic, and military strength of the alliances. Includes the exploration of the trends in the development and employment of military power and the impact of these trends on world affairs. (2Sp) Maj. Jarrell

AEROSPACE STUDIES OE 300
FIRST YEAR
PROFESSIONAL OFFICER COURSE

Growth and Development of Aerospace Power. The course develops an understanding of the military characteristics of aerospace power and the development of doctrine governing its employment. Presents the role of space explorations and operations in maintaining general supremacy in aerospace. Includes the United States space programs, vehicles, systems and problems in space explorations. Three class hours and a leadership laboratory period each quarter.

AS 131. Growth and Development of Aerospace Power. Study consists of the nature of war, history of airpower and impact of the Nuclear Weapon (3F) McCallson

AS 132. Growth and Development of Aerospace Power. Study consists of importance of a national space effort, development of the space program, the spatial environment, orbits and trajectories, space vehicle systems, propulsions, propellants and power sources, instrumentation, communications, guidance and control, ground support systems, manned space flight and operations in space, and a leadership laboratory period. (3W) McCallson

AS 133. Growth and Development of Aerospace Power. Study consists of the mission and organization of the Department of Defense and the future developments of aerospace powers, and a leadership laboratory period. (3Sp) McCallson

AEROSPACE STUDIES OE 400
SECOND YEAR
PROFESSIONAL OFFICER COURSE

This course is concerned with depicting the Air Force as a profession, to develop understanding of the practicing of professionalism in the Air Force, to reveal the responsibility and authority of the Junior Officer duties.

AS 141. Military Professionalism. The general characteristics of the Air Force profession, an understanding of the background of the Air Force officer's professional code. Military laws governing members of the Armed Forces, understanding the functions of the military justice system, basic principles and procedures of courts and boards. Three class hours per week, one hour of leadership laboratory (3F) Staff

AS 142. Leadership and Management. The professional concept of military duty, management principles, responsibilities of commanders and members of command, leadership related to command and staff roles, factors and variables of leadership, functions of military discipline characteristics of human relation problems, Air Force Personnel Policies and channels of communication. Three classroom hours per week, one hour of leadership laboratory. (3W) Staff

AS 143. The Junior Officer as Administrator. Principles of organization, duties and responsibilities of the Squadron Officer, Air Force regulations, Personnel Problems, financial control, use of reports, Air Force Management Concept, Machine Accounting system, mechanized records keeping and the Air Force inspection system. Three classroom hours per week, one hour of leadership laboratory. (3Sp) Staff

AS 150. Aerospace Studies. 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 communications, navigation, supply, biological and chemical warfare, weather, traffic control, first aid and sanitation. Pressure and altitude chamber experience complete with orientation lectures, as given to regular Air Force jet pilots, permits cadets to ride in jet aircraft. A minimum of two flights is permitted to each cadet, one thirty minute jet ride, and one ride in another type aircraft as a crew member. Cadets participate in 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 Aerospace Studies based upon emergency situations of extreme hardship. If an exemption is granted,
the cadet must attend summer training at the end of his Senior year and will be commissioned upon successfully completing the summer training if his university degree requirements have been met. (6Su) Staff

AS 145. Aerospace Studies. Flight Instruction Program. This course covers instructions in ground school, Civil Air Regulations, Weather and Navigation, Radio and Airways procedures, general service and operation of aircraft. Flight instruction includes 36½ hours on light aircraft and includes pre-flight checks, solo's, cross country flights and FAA flight examinations. Subject open only to qualified Senior AFROTC Cadets. Instruction arranged to not interfere with regular academic schedule. Ground school taught on campus. (3F, W, Sp) Staff

Department of

Military Science

Head: Professor Colonel Bert Perrin, Infantry
Office in Military Science 101

Assistant Professors Captain Patrick D. Louney, Ordinance Corps, Captain Ernest E. Beach, Quartermaster Corps.

ROTC's purpose is to develop reserve officers in sufficient quantity to provide a nucleus of well educated, all-around leaders for an army that would have to expand rapidly in the event of a national emergency. In this present period of "limited" emergency, the program produces new Second Lieutenants for the Active Army and the Army Reserve. A limited number of Distinguished Military graduates are offered commissions in the Regular Army.

To be eligible for a commission as a Reserve Second Lieutenant a student must not have reached his 28th birthday prior to appointment. If he is commissioned in the Army Reserve and unless he has completed flight training, he will be required to serve either six months or two years on active duty. If he participates in flight training, he must serve three years on active duty.

The Army ROTC offers a two and a four year program. The Army ROTC four-year program consists of two courses: Basic and Advanced. 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.

The two-year program is designed for students who transfer to the University from another institution where ROTC was not offered, to include Junior Colleges, or for those students of Utah State University who are unable to take the Army ROTC four-year program because of scheduling difficulties.

In the two-year program a 3rd quarter Sophomore student will take the entrance examinations, go before a board of officers to determine eligibility for commission and if selected for the Advanced Course will attend a six-week basic summer camp prior to enrollment in the Advanced Course.

After completion of the two-year Basic Course or summer camp and selection for further training, cadets may enroll in the Advanced Course, subject to any quota limitations. Under the provisions of the contract
between the University and the Department of the Army, the University agrees to require that each student who enrolls will complete the course as a prerequisite to his graduation. Therefore, if he enrolls in the Advanced Course, he must complete that course unless relieved of this obligation by regulations prescribed by the Secretary of the Army. Signing of an ROTC draft agreement as a Basic Course student obligates him to elect enrollment in the Advanced Course if selected for it.

Any person who is selected and enrolled in the Advanced Course of Army ROTC will enlist in the Army Reserve but will not attend meetings other than ROTC classes. He will also sign a contract with the U. S. Army agreeing to serve as a Commissioned Officer for the period specified by law (6 months to 2 years).

**Academic Course Substitutes.** Recognizing the modern Army leader’s need for certain training to prepare him for responsibilities of diplomat, scientist, or statesman while in the military service, the Army has authorized substitution of certain academic University courses in lieu of some ROTC classroom instruction. In 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 III and summer camp. Academic credit may be arranged upon completion of the program. The flight program consists of 71 1/2 hours of training; 35 hours of ground and 36 1/2 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.

**Payment at Basic Summer Camp.** Students who follow the two-year course and must attend the basic six-week summer camp will be paid $78 per month and travel pay to and from their home of residence and the camp at a rate of $.06 per mile.

**Veterans.** Veterans may be given credit for all or part of the Basic
Course, depending upon length of service. Enrollment in the Advanced program is contingent upon selection as in the case of other cadets.

High School ROTC. Students who have completed the three-year high school ROTC program may be given credit for the first year Basic Course.

Military Science Major. A major in Military Science is offered by the Army ROTC department. This major is intended to serve two categories: service personnel stationed at near-by military installations who desire to complete a degree while in the service, and college students interested in the possibility of making a career of the service. The latter who elect this major are required to complete a dual major, the purpose of which is to assure adequate preparation for the future in the event they are not selected or cannot qualify for a reserve commission. Further, it is not possible for a student to qualify for a major in Military Science if he fails to be selected for Advanced ROTC. Although all major fields at this institution are acceptable in a dual major, the following are particularly recommended: Engineering, Physics, Chemistry, Mathematics, Political Science, or Psychology. A Freshman student electing Military Science as a major is advised to pursue one of the above fields. In addition to Basic ROTC he should concentrate on filling lower division group requirements and strive for a high grade point average.

Payment to Advanced Cadets. Upon enrollment in the Advanced Course students will enlist in the Army Reserve and will receive Retainer Allowance of $40 per month for a period of twenty months. They will further receive a travel allowance to and from Advanced Course Summer Camp and their home of residence at a rate of $.06 a mile. While at the Advanced Course summer camp the student will receive $120 per month plus room and board. Upon entrance into active duty the cadet will receive a $300 uniform allowance.

Regular Commissions in the United States Army. Each year outstanding Army ROTC cadets who have demonstrated a high degree of leadership, initiative and desire for a career as a Regular Army Officer are designated Distinguished Military Graduate and are offered an opportunity to apply for a Regular Army Commission.

Delay of Entry on Active Duty. When students have completed the Army ROTC program and are commissioned they may delay entry upon active duty to continue advanced studies. The U.S. Army will delay call to active duty one year at a time up to four years providing the applicant shows acceptance to an accredited Graduate School and maintains requirements for retention in the Graduate School. In special cases, where more than four years are required for a Doctor's degree, additional delay time will be granted by Department of the Army.

Texts and Uniforms. All texts and uniforms are furnished at no expense to the student.

Sponsor Corps

Sponsor Corps is a semi-military organization composed of 50 coeds chosen for the Corps by the Sponsor Staff, with final selection being made by a board of judges. Former members of Sponsor units recognized by the national organization may transfer upon application. 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 usher-
ing service for the University, to perform as drill units in a variety of exhibitions and to assist the ROTC Department in furthering their aims of military interest on campus.

Sponsor Corps Courses

51, 52, 53. Sponsors Drill, Freshmen. A course in leadership organization and drill for women elected to Corps of Sponsors. (1F, 1W, 1Sp) Staff
54, 55, 56. Sponsors Drill Sophomores. (1F 1W, 1Sp) Staff
151, 152, 153. Sponsors Drill, Juniors. (1F, 1W, 1Sp) Staff
154, 155, 156. Sponsors Drill, Seniors. (1F, 1W, 1Sp) Staff

Basic Military Science
MS I—First Year Basic
Director: Capt Ernest E. Beach

11. Military Science I. Organization of the Army and ROTC; U.S. Army and National Security; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (2F) Beach
12. Military Science I. Continuation of Military Science 11. Individual Weapons and Marksmanship; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (2W) Robertson
13. Military Science I. Continuation of Military Science 12. U.S. Army and National Security; Leadership, Drill and Command. One class period and one leadership laboratory period per week. (2Sp) Beach

MS II—Second Year Basic
Director: Col. Bert Perrin

21. Military Science II. American Military History, Leadership, Drill and Command. Prerequisites: Military Science 11, 12 and 13 or 24. Two class periods and one leadership laboratory period per week. (3F) Perrin
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. (2W) Perrin

24. Military Science II. Special Studies. Tutored study for students who have not been able to take Basic courses at their regularly offered times. (SF, 3W, 3Sp) Staff

Advanced Military Science
MS III—First Year Advanced
Director: Major 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 (3F) 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. (3W) 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. (3Sp) 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. (3Bu) Smith

MS IV—Second Year Advanced
Director: Col. Bert Perrin

141. Military Science IV. Operations; Logistics; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (3F) Perrin
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. (3W) Heinrick
143. Military Science IV. Continuation of Military Science 142. Military Law; Service Orientation; Leadership, Drill and Command. Two class periods and one leadership laboratory period per week. (3Sp) Beach
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.
Army flight physical requirements. (3F, W, Sp)

Seminar

174. Advanced Military Science Seminar Problems. Prerequisite: Enrollment in or completion of Advanced Military Science. Credits arranged. (F, W, Sp) Staff

201. Advanced Military Science Seminar Problems. Prerequisite: Graduate standing. Credits arranged. (F, W, Sp) Staff
College of Education

Department of Educational Administration, 111
Department of Elementary Education, 113
Department of Health, Physical Education and Recreation, 118
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Department of Psychology, 127
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Degrees Offered:
- Bachelor of Arts
- Bachelor of Science
- Master of Education
- Master of Arts
- Master of Science
- Diploma in Educational Administration
- Doctor of Education
College of Education

John C. Carlisle, Dean
Oral L. Ballam, Assistant to the Dean
Office in Education 203

The College of Education has several principal functions. It prepares teachers, administrators, supervisors and other professional personnel for the public schools. Through graduate programs leading to advanced degrees it prepares college teachers. The departments of Psychology, Health, Physical Education and Recreation and Library Science, in particular, have curriculum programs for the preparation of professional specialists in fields other than in Education.

Included within the College are the following departments: Elementary Education; Secondary Education; Educational Administration; Special Education; Health, Physical Education, and Recreation; Psychology; and a program in Library Science.

In addition to offering majors and minors, each department offers courses contributing to general education as well as courses designed to supplement the major work of other departments in the University.

The College of Education is a member of the American Association of Colleges for teacher education and is accredited through the Doctoral degree by the National Council for Accreditation of Teacher Education.

Admission Requirements. Enrollment in the lower division of the College of Education is dependent upon meeting the general admission requirements of the University. Each application is reviewed by the Dean of the College. However, admission to the professional education curricula requires formal action by a faculty committee on admission to teacher education. The latter procedure applies to all curricula leading to graduation, where in 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 preparing to teach kindergarten and grades one through six. Here child understanding and behavior are studied and desirable school practices are developed.

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 University Council on Teaching Education coordinates all activities dealing with the preparation of teachers and other professional school personnel. Members of the council are appointed by the President of the University from the College of Education and 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 one of its official representatives in administering certification requirements for students.

The University provides training to prepare students for any of the professional certificates issued by the Utah State Department of Public Instruction.

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 cooperating 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.

Dual Certification. A student desiring to obtain both the elementary and the secondary certificates should consult with an adviser in the Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

On the graduate level, programs are offered for students who desire to meet requirements for adminis-
trative supervisory, teaching or other advanced professional certificates. The MEd, MS, MA, and EdD degrees are offered; also the Diploma in School Administration requiring a two-year sequence in graduate work. 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 Bureau.** The University is interested in placing its graduates in professional positions. To accomplish this purpose in the College of Education, the Teacher Placement Bureau has been organized. If students qualify for a teaching or other professional certificate, they must register with the Bureau as a help in compiling the proper credentials to be used in placement. Application for membership should be made prior to student teaching whenever possible. No fee is charged for membership in the Bureau.

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**Department of Educational Administration**

**Acting Head:** Associate Professor Homer M. Johnson  
**Office in Education 206**


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**The Educational Administration Program**

Graduate work leading to the Degrees of Master of Arts, Master of Science, Master of Education, Specialist in Educational Administration, and Doctor of Education is available to individuals desiring involvement in Educational Administration. The Masters degrees are primarily for those who wish to be elementary or secondary school principals. The Doctor’s degree is intended to train people for top administrative positions or higher education. In addition, the Diploma in Educational Administration is offered for those who wish to qualify as superintendents or staff administrative personnel.

The Masters degrees will meet the present certification requirements in Utah. The Specialist and Doctorate go beyond present certificate requirements, both meeting the standards for membership in the American Association of School Administrators.

All programs through the Doctor’s degree are approved by the National Council for Accreditation of Teacher Education which in turn means approval by AASA.

For additional information and more specific details, see the Graduate Catalog or contact the Head of the Department of Educational Administration.
Educational Administration Courses

150. The American School System. Fundamental principles of operating public schools with emphasis on Utah conditions. An analysis of the public schools system as it has developed in the United States. (3F, W, Sp, Su) Ballam, Noble, Hansen, H. Johnson

152. Social Foundation of Education. The significance of society on current educational theories and practices. (3W) Hansen

153. History of Education. Major educational movements from early Greek to the present, with emphasis on purposes, organization, instructional procedures, curriculum, etc., and their bearing on today's education. (3F, W, Sp, Su) Hansen, Noble

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

258. 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. (3Sp, Su) Hansen

254. Organization and Administration of Education. The work of the school administrator and the principles upon which the profession of school administration is practiced. Federal, state, and local relations to education. (3W, Sp, Su) Hansen, H. Johnson

260. Historical and Philosophical Foundations of Education. Deals with major philosophies of education in their historical setting and their effect upon subsequent development of the American school system. (3F, Sp, Su) Hansen

262. Organization and Administration of Guidance. An analysis of concepts, plans, relationships, and problems involved in the effective development and operation of guidance services and activities at all levels of education. (3W, Su) Himes

264. Instructional Leadership in Education. Principles and practices of school supervision, including qualifications and responsibilities of supervisors of instruction in public education. The role of the principal, the curriculum director and other administrators in instructional leadership will be considered. (3W, Su) Staff

266. Introduction to Research in Education. This course is to provide teachers and school administrators with research tools that they may apply directly to their practical problems. The specific objectives of the course are: 1. to give students an appreciation of scientific methods of problem solution 2. to acquaint students with a research literature in Education and teach them how to use it 3. to provide training and experience in action research 4. to teach students how to plan, carry out, and report a project for the Master of Education degree. Prerequisite or taken concurrently. Ed 164. (3F, Sp, Su) Carlisle, Borg

267. Research in Psychology and Education. Deals with identifying a problem for the thesis or seminar report, reviewing and evaluating research literature, and designing and carrying out the research project. A portion of the student's thesis or seminar report is prepared as the term paper. The instructor schedules individual conferences to assist the student in the initial planning of his thesis or seminar report. Prerequisite: Psy 112. (3F, Sp, Su) Borg

269. Comparative Education. A study of the school system and educational problems of Europe, Latin America, the Middle East, Far East, and Russia. Students from foreign lands and resident faculty members personally acquainted with various educational programs are utilized as resource persons. (3W, Su) Hansen

270. Public Relations in Education. Objectives, guiding principles, techniques and media for an improved school public relations program. (3Sp, Su) Drake, Ballam

274. Legal Aspects of School Administration. Emphasizes responsibilities and functions of local and district school administrators. Interpretation of legal status, form and procedure, as established by statutes, legal opinions, and court decisions. (2W, Su) Hatch

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

278. Seminar in Administration of Education. 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. (2Sp, Su) H. Johnson, Ballam, Hatch

279. General Seminar in Education. Opportunity for investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all graduate Education majors. (1F, W, Sp, Su) Ballam, Hatch, Hansen

283. Reading and Conference. Provides for individually directed study in subjects of spe-
cial interest and preparation. Credit arranged. (F, W, Sp, Su) Staff


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. (F, W, Sp, Su) H. Johnson


361. Readings in Foundations of Education. Considers problems of education in terms of their sociological, historical, and philosophical foundations. (3W, Su) Hansen

362. Group Processes in Educational Leadership. Analysis of the work of the school administrators and supervisors in dealing with various groups concerned with public education, school faculties, boards of education, parent-teacher groups, and the like. Research from studies in group dynamics will be drawn upon. (3Sp, Su) H. Johnson

367. Administration of School Personnel. Principles and practices in management of teachers, other school employees, and pupils. (3Sp, Su) Ballam

368. Higher Education. A study of the development and current status of education beyond the high school in America. (F) Himes

374. Practicum in Public School Surveys. The students in the class will participate in making a field study or survey of a school district. Classroom discussions will be concerned with practical problems of the particular district. Education literature dealing with the area of school surveys will also be extensively considered. Open only to advanced students in school administration with the specific approval of the instructor. Time and credit arranged. H. Johnson

381. School Finance. Historical background of school finance; principles and practices involved in collecting and distributing school revenues, with special reference to conditions in Utah. (3F, Su) Ballam

382. School Business Management. A study of the factors involved in the efficient business management of school systems and individual schools. For school administrators, school business managers, clerks and students preparing for these positions. (3Sp, Su) Staff

383. Interdisciplinary Seminar in School Administration. Specialists in the social sciences will discuss current problems in their respective areas, particularly as they are related to public education and the role of the school administrator. Class members will be expected to have had some advanced courses in the social sciences. Enrollment with the consent of the instructor. (2Sp, Su) Hatch, Carlisle

384. Internship in School Administration. Provides extensive experience for the advanced student working on the Doctor of Education Degree in School Administration. Class members work a minimum of one quarter full time under the direction of an administrator in the public schools. Credit arranged. (F, W, Sp) H. Johnson, Ballam

385. Field Studies and Thesis. Formerly 375. Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su) Staff

Department of

Elementary Education

Acting Head: Associate Professor Malcom Allred
Office in Forestry and Zoology 213

Associate Professors Bryce Adkins, Arthur D. Jackson, Director, Edith Bowen Laboratory School, Edith S. Shaw, Director, Elementary Student Teaching; Assistant Professors L. Gail Johnson, Ivan Pedersen, Dorothy Jean Pugmire, Thomas Taylor, Evelyn Wiggins, John R. Williams; Instructors Joan C. Bowden, Barbara B. Howell, Kathryn Salisbury, Helen Tanner, Eyre Turner.
The function of the Department of Elementary Education is the preparation for certification of teachers, supervisors, administrators and other professional personnel for positions in the elementary schools. The Department, in cooperation with the College of Education and with the support of the University, offers the Bachelor of Science Degree with a major in Elementary Education designed to prepare the student to teach in the elementary school.

On the graduate level, the Department of Elementary Education is an integral part of the College of Education and assists in the preparation of students seeking the MA, MEd, MS and EdD Degrees as well as the Diploma in School Administration. Students who desire information relative to the graduate program should write to the Graduate School Dean or to the Head of the Department of Elementary Education for detailed information.

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:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr.</th>
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<tbody>
<tr>
<td>Biological Science</td>
<td>10</td>
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<tr>
<td>(Students may select from: Bacteriology, Biology, Botany, Physiology, Zoology, and others with the approval of the adviser.)</td>
<td></td>
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<tr>
<td>Exact Science</td>
<td>10</td>
</tr>
<tr>
<td>(Students may select from: Mathematics, Chemistry, Physics, Geology, and others with the approval of the adviser.)</td>
<td></td>
</tr>
<tr>
<td>Foreign Language or Literature and Speech</td>
<td>10</td>
</tr>
<tr>
<td>Social Science</td>
<td>10</td>
</tr>
<tr>
<td>(Students must select one of the following: History 20, or Economics 51, or Political Science 10. Additional credits may be selected with the approval of the adviser.)</td>
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<tr>
<td>Psychology 53</td>
<td>5</td>
</tr>
<tr>
<td>Basic Communications</td>
<td>9</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>6</td>
</tr>
<tr>
<td>(Students may select from Music, Art, and Theater with the approval of the adviser.)</td>
<td></td>
</tr>
<tr>
<td>Physical Education</td>
<td>3</td>
</tr>
</tbody>
</table>

A student who meets these requirements for certification also meets the lower division requirements for graduation from the University at the same time.

(2) Areas of academic concentration. Thirty-six credit hours in one field of concentration or eighteen hours in each of two fields are required. Students are encouraged to go beyond the minimum requirements in areas of academic concentration and should include some upper division courses in these areas.

If one field of concentration is selected, this field must be a subject area that is taught in the elementary school (science, mathematics, social studies, etc.). If two minor fields are selected, the first must be a subject area that is taught in the elementary school. The second should also be a subject area. However, it may be a supporting area, if the student has prior approval of his adviser and the Department of Elementary Education. Supporting areas are those directly concerned with the school, the pupils, or the profession.
(3) **Professional Education.** A major of at least 48 credit hours in professional education courses is required as follows:

**Group I Understanding the Child (minimum of 9 credits)**  
Psychology 100 or CD 100 ........ 3  
Public Health 155 ........ 3

Additional credits selected from the following: Psychology 180, 181, 182, 183, 123, 145; Speech 167; Child Development 67, 68 ........ 3

**Group II Understanding the School (minimum of 7 credits)**  
Education 100 .................. 4  
Education 150 ........ 3

**Group III Curriculum and Methods (minimum of 32 credits)**  
Education 104 .................. 5  
Education 105 ........ 3  
Education 106 .......... 12  
Education 107 .................. 3  
Psychology 106 ........ 3

Elective Courses (minimum of 6 credits) selected from the following:  
Education 102 ........ 3  
Education 108 ........ 3  
Education 109 ........ 3  
Education 112 ........ 3  
Education 116 ........ 3  
Education 161 ........ 3  
Education 186 ........ 3  
Psychology 127 ........ 3  
English 122 ........ 3  
Music 150 ........ 3  
Art 151 ........ 3  
Physical Education 177 ........ 3  
Physical Education 182 ........ 3  
Instruction Education 180 ........ 3  
Speech 118 ........ 3  
Speech 122 ........ 3  
Forestry 110 ........ 3

(Other courses may be selected with the approval of the adviser.)

**Suggested Sequence of Courses First and Second Years**  
Concentrate on filling lower division requirements and beginning work in the major or minor fields.

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**Third Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Psychology 100</td>
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<tr>
<td>Public Health 155</td>
<td></td>
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<tr>
<td>Education 100</td>
<td></td>
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<tr>
<td>Education 150</td>
<td></td>
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<tr>
<td>Courses to complete the major field of concentration or two minors.</td>
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<tr>
<td>Electives in Education and related areas.</td>
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</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Psychology 108</td>
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<tr>
<td>Education 104</td>
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<tr>
<td>Education 105</td>
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<tr>
<td>Education 106</td>
<td></td>
</tr>
<tr>
<td>Courses to complete the major field of concentration or two minors.</td>
<td></td>
</tr>
<tr>
<td>Elective courses in Education and related areas.</td>
<td></td>
</tr>
</tbody>
</table>

**Kindergarten Certification.** Having completed the requirements for the elementary school certificate, a student may obtain the Kindergarten Certificate by completing Education 116 and 106B. Application for 106B 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 adviser in the Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

**Out-of-State Certification.** A student interested in meeting certification requirements of other states should check with his advisers for specific courses required.

A student is not permitted to enroll in professional courses in education unless he has been admitted to the Teacher Education Program, nor will a student be admitted to student teaching in elementary education unless his total grade point is 2.0 or above, and the grade point averages in the areas of academic concentration and professional certification subjects are 2.5 or above.
116 College of Education

The student must be financially prepared to spend a quarter off campus student-teaching.

Education Courses

100. Principles of Elementary Education. An introduction to the elementary school; its background and development, philosophy, personnel, practices, achievements, and its place in the American system of education. (4F, W, Sp, Su) Staff
   Williams, Jackson

102. Teaching the Language Arts. A study of language development in children and its implication for classroom practice: listening, speaking, writing and reading. (3Sp, Su) Staff
   Shaw, Wiggins

104. Elementary School Curriculum. Familiarizes prospective teachers with the nature and content of the elementary curriculum and factors that influence its development. Includes an introduction to the teaching guides for Utah elementary schools, and considers some of the objectives, methods of instruction, teaching aids and materials, and sources of information related to the curriculum. (5F, W, Sp, Su) Staff
   Pugmire, Allred, Wiggins

105. Principles of Teaching in the Elementary School. The purposeful activity of the child as the basic factor determining teaching procedure. Significance of individual differences in application to school-room practices. Consideration of classroom planning, organization and environment. To be taken concurrently with student teaching. (3F, W, Sp, Su) Staff
   Shaw, Pugmire, Wiggins, Allred

106. Student Teaching in the Elementary School. For juniors and seniors who have had a substantial amount of professional course work including Principles of Elementary Education, Educational Psychology, and Elementary School Curriculum. The apprentice plan is followed which requires an initial period of observation with minor responsibilities but with gradual increase of work and responsibility as the student's ability is demonstrated. Application for student teaching 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. Students enrolled in this class may be assigned by the University to work in selected public schools throughout the State and must make plans to spend this quarter off campus. (12F, W, Sp) Staff

107. Teaching of Reading. Considers the objectives of the reading program, stages of reading development, skills and attitudes to be gained, the materials of instruction, and the experiences of children that contribute to the achievement of the objectives in reading. Opportunities for observation of reading situations in elementary school classrooms. (3F, W, Sp, Su) Staff
   G. Johnson, Shaw, Wiggins

108. Social Studies in the Elementary School. Organizing the elementary curriculum to provide social studies experiences consistent with the nature of the child and the democratic society in which he lives. (3W, Su) Staff
   Allred, 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. (3W, Sp, Su) Staff
   Adkins, T. Taylor

110. Principles of Conservation. See Forestry 110. (3F, Su) Staff
   C. Johnson

112. Arithmetic in the Elementary School. The place of arithmetic in the elementary school curriculum and methods of teaching it in the several grades. (3F, Sp, Su) Staff
   Adkins, Jackson, T. Taylor

116. Curriculum and Methods for Kindergarten. The study of the kindergarten program with emphasis on the influence of recent research in child development and human relations. Special attention will be given to planning the curriculum, methods, materials and equipment used in the kindergarten. (3F, Su) Staff
   Pugmire, Shaw

   Himes

   Drake, Beutler

162. Audio-Visual Techniques. See Sec Ed 162. (3Su) Staff
   Drake

163. New Media in Education. See Sec Ed 163. (3F, W, Sp, Su) Staff
   Johnson
164. Measurement and Evaluation in Education. See Sec Ed 164. Borg, Himes

188. Diagnosis of Reading. For teachers, supervisors, and others interested in remedial reading instruction. Concerned with causes of reading disability, diagnostic tests, and procedure used in remedial reading. Prerequisite: Education 107 or two years teaching experience in the elementary school. Concurrent enrollment in Education 190. (3W, Su) G. Johnson, Stone

189. Remedial Reading Instruction. Designed to follow Education 188. Considers the nature of remedial reading instruction, selection of remedial students, group and individual instruction, methods and materials used in remedial reading programs. Concurrent enrollment in Education 190. (3Sp, Su) G. Johnson

190. Practicum in Remedial Reading. Provides opportunity for the student to work with children in need of remedial help in reading. Enrollment only with the consent of the instructor. (3W, Sp, Su) G. Johnson

204. Elementary School Curriculum, Advanced Course. Designed for experienced teachers. It deals with new concepts in elementary curriculum resulting from recent research in the field. Class members will have opportunity to develop curriculum materials in their areas of interest. (3F, Sp, Su) Adkins, Alred

207. Elementary School Administration. See Educational Administration 207. (3F, Su) Alred, Alred

219. Seminar in Elementary Education. Formerly 245. 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. (2Sp, Su) Adkins, Alred, Jackson

220. Creative Education in the Elementary School. Exploration of research concerning creativity in education and ways and means of utilizing basic principles in this area in the improvement of classroom practices. (3W, Su) Shaw

225. Improvement of Reading in the Elementary School. In addition to a concern for an adequate developmental reading program, emphasis will be placed on helping the child who is having reading difficulties. Prerequisite: Ed 107 or teaching experience in elementary school. (3F, Su) Alred, G. Johnson

226. Improvement of Science in the Elementary School. For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in science in the elementary schools. Prerequisite: Ed 109 or teaching experience in elementary school. (3W, Su) Adkins, Braswell


228. Improvement of Social Studies in the Elementary School. For experienced teachers. Deals with newer concepts of curriculum and methods of instruction in social studies in the elementary school. Prerequisite: Ed 108 or teaching experience in elementary school. (3Sp, Su) Alred

229. Improvement of Language Arts in the Elementary School. For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in language arts in the elementary school. (3Sp, Su) Wiggins

232. Aerospace Education. See Sec Ed 232. (3Su)

259. Supervising Student Teaching. Considers ways and means of providing desirable experiences for student teachers in the public schools. The role of the classroom teacher and the college supervisor will be analyzed. (3F, Su) Budge, Shaw, Wiggins


266. Introduction to Research in Education. See Educ Adm 266. (3F, Sp, Su) Carlisle, Borg

267. Research in Psychology and Education. See Educ Adm 267. (3F, Sp, Su) Carlisle, Borg

283. Reading and Conference. Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su) Staff


385. Field Studies and Thesis. Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su) Staff
Activity Courses — Intramural Sports — Recreation Activity Courses. In the activity courses opportunity is given to develop skills in some physical activity that will help establish a permanent interest in healthful recreation, promote physical fitness, build morale, and maintain health.

All students under the age of 31 must meet the school requirements of three quarters of Physical Education. This requirement should be met by the end of the sixth quarter of residence work. Men may meet this requirement by taking Military or Air Science. (It is recommended that requirements (a) and (b) below be completed during the first year.)

The requirement must be met by taking: (a) Physical Education 1 (Basic Physical Education), (b) a swimming course,—Note: Either or both of these courses may be met by passing waiver tests administered by the Physical Education Department after which students may select courses rather than register for required courses (a) - (b). Selected courses are from five activity groups. Only one course from a group may count toward the requirement. Courses, by groups, are as follows:

Aquatics—All swimming classes.
Dance—All dance classes.
Dual Activities—Boxing (Men), Wrestling (Men), Fencing, Badminton, and Tennis.

Individual Activities — Skiing, Track (Men), Bowling, Weight Training (Men), Self Defense (Men), Trampoline (Men), Tumbling-Gymnastics (Men), Tumbling Stunts (Women), Adapted Body Conditioning (Women), Archery, Golf, and Cross Country (Men).

Team Activities — Football (Men), Baseball (Men), Softball (Men), Basketball (Men), Soccer (Men), Volleyball (Men), Soccer-Speedball (Women), Volleyball (Women), Basketball (Women), Softball (Women), and Field Hockey (Women).

Intramural Activities are conducted by the Department. The intramural program is planned to give moral, social, physical and educational values derived from competitive sports. This program provides for both individual and team endeavor, and the Department attempts to make it possible for all students to participate.

The Women’s Intramural Association offers a varied program of activities. All women are eligible
and encouraged to participate in any of the activities offered.

The Department offers an extensive intramural sports program for men. Competition in a variety of activities is conducted in separate leagues: fraternity, department, club, and all-campus. All men are encouraged to participate in one of these leagues.

Recreation. The Department attempts to meet recreational interests of the total 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.

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 advisers. The following courses, in addition to the three credits required for graduation are suggested for each of the above areas:

As a Non-certifying Physical Education major complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 83, 85, or 92, 106, 107, 108, 183; six credits in Sports Techniques and ten credits from approved electives.

If specializing in Elementary Physical Education, the student should complete Physical Education 24, 55, 75, 81, 83, 85 or 92, 106, 120, 177, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.

If specializing in Dance, a student should complete Physical 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. PE 165, 183, 192.

For a composite major in Dance and Physical Education a student should complete Physical Education 20, 24, 26, 74, 75, 77, 78, 79, 81 or 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 advisers in selecting courses to fill groups and minor requirements.

Teaching Minor in Physical Education

Men: RE 83, PE 85, PE 106, PE 120, PE 183 or PE 184, PE 188, 189, or 190, PE 121, 122, 130, or 131. 4 to 6 hours of electives. 24 to 26 total hours.

Women: PE 20 or 22, 24 or 68, PE 183 or 184, 122 or 165, 1 from 94, 95, 96, 98, 12 from 48, 49, 51, 2 from 77, 78, 79 160, 161, 162, Elective 3 credits.

Teaching Major in Physical Education

For Secondary Physical Education majors the following four year programs are suggested.
### 120 College of Education

#### MEN FRESHMAN

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>PE 20, 21, 22</td>
<td>1 1 1</td>
</tr>
<tr>
<td>PE 75</td>
<td>2</td>
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<tr>
<td>PE 17A</td>
<td>Any Quarter</td>
</tr>
<tr>
<td>Group Req</td>
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</tr>
<tr>
<td>Minor</td>
<td>Any Quarter</td>
</tr>
<tr>
<td>English 1, 2, 3</td>
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<tr>
<td>Electives</td>
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#### SOPHOMORE

<table>
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<tr>
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<tbody>
<tr>
<td>PE 30, 31, 32</td>
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<tr>
<td>PE 74</td>
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<tr>
<td>PE 83</td>
<td>3</td>
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<td>Physiol 20</td>
<td>3 3</td>
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<tr>
<td>PE 85</td>
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<td>Any Quarter</td>
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<td>Group Req</td>
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<tr>
<td>Electives (include Physiol 20--Human Anatomy)</td>
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#### JUNIOR

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<tr>
<td>PE 120, 121, 122</td>
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<tr>
<td>PE 106, 107, 108</td>
<td>3 3 3</td>
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<tr>
<td>PE 189, 188, 190</td>
<td>2 2 2</td>
</tr>
<tr>
<td>PE 132</td>
<td>Any Quarter</td>
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<tr>
<td>Education 106</td>
<td>Any Quarter</td>
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<tr>
<td>Psychology 100 and 102</td>
<td>Any Quarter</td>
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<tr>
<td>PH 154 or 155</td>
<td>Any Quarter</td>
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<tr>
<td>Minor</td>
<td>Any Quarter</td>
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<tr>
<td>Elective</td>
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#### SENIOR

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<tbody>
<tr>
<td>PE 130, 131</td>
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<tr>
<td>PE 183, 192, 184</td>
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</tr>
<tr>
<td>Education 127, 129, 130</td>
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<tr>
<td>PE 132</td>
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<td>Minor</td>
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#### WOMEN FRESHMAN

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<tr>
<td>PE 24, 26</td>
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</tr>
<tr>
<td>PE 88</td>
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</tr>
<tr>
<td>PE 17A</td>
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<tr>
<td>Basic Communications</td>
<td>3 3 3</td>
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<tr>
<td>Electives</td>
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#### SOPHOMORE

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<tr>
<td>PE 92, Physiol 20</td>
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<tr>
<td>PE 77, 78, 79</td>
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<tr>
<td>PE 94, 95, 96</td>
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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, PH 15, PH 150, HE 55, HE 135, HE 145, HE 163, Foods FN 24, F CD 120, and Psy 145 or SW 162.

(B) Recommended Courses (A minimum of 10 hours must be selected from this group): Zoology 102, PE 84, PE 106, PH 50, Psychology 140,

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1 Recommended Group Requirement. Ex Sc: Chem 10 and Phys 3 or 6; Biol Sc: Zoology 1 and Physiology 4.

2 Courses taught more than one quarter each year.
and Psychology 202. (C) The following courses will also count toward completion of a Health Education major; PH 152, 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: PH 15, PH 150, HE 55, HE 145, Foods 24, and Psy 145 or SW 165, FN 22.

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: PE 74, RE 83, PE 85, PE 106, PE 120, PE 153, RE 157, RE 179, PE 183, RE 196, Theater Arts 158, Speech 118, Ind Arts 180, Landscape Arch 130, Pol Science 15; plus 4 credits from the following: PE 177 or 182, PE 175, PE Sports Fund. Courses, PE Tech. Technique Courses, Forestry 137, 138 or 139, Soc 141, CD 100 or PE 84, Bus Admin 100.

For a minor in Recreation Education a student must complete: RE 83, RE 179, PE 183, RE 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: PE 250 or 294, 271, 295, 299. English 111 or 211, Psychology 112.

Health, Physical Education and Recreation Activity Courses

Activity Courses for Men

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

Activity Courses for Women

1. Basic Physical Education (1F, W, Sp) Staff
14. Track and Field (1F, 1Sp) Staff
39. Soccer-Speedball (1F) Staff
40. Volleyball (1F, 1W) Staff
41. Basketball (1W) Staff
42. Softball (1Sp) Staff
43. Field Hockey (1Sp) Staff
44. Tumbling and Stunts (1W, 1Sp) Staff
52. Swimming (Beginning) (1F, 1W, 1Sp) Staff
56. Swimming (Intermediate) (1F, 1W or 1Sp) Staff
57. Synchronized Swimming (1F) Staff
58. Gymnastics (Advanced) (1F, W, Sp) Mendini
60. Body Conditioning (1F, W, Sp) Staff
Activity Courses for Men and Women

3. Skiing (Beginning) (1W) Staff
9. Fencing (1F, 1W, 1Sp) Downs
13. Bowling (1F, 1W, 1Sp) Staff
18. Swimming (Advanced) (1F, 1W, 1Sp) Staff
19. Skiing (Intermediate) (1W) Staff
28. Diving. Prerequisite: PE MW 18. (1Sp) Staff
33. Skiing (Advanced) (1W) Staff
45, 46, 47. Adapted Physical Education. Designed to meet the needs of individuals who are unable to participate in the required program of Physical Education. Students must obtain permission of the head of the department before registering. (1F, 1W, 1Sp) D. Nelson
48. Modern Dance (Beginning) (1F, 1W) Fuller
49. Modern Dance (Intermediate) (1W, 1Sp) Fuller
51. Modern Dance (Advanced) (1W, 1Sp) Fuller
53. Square Dancing (1F, 1W, 1Sp) Burnett
61. Archery (Beginning) (1F, 1W, 1Sp) Staff
62. Archery (Advanced) (1W, 1Sp) Staff
66. Badminton (Beginning) (1F, 1W) Staff
67. Tennis (Beginning) (1F, 1Sp) Staff
68. Folk Dance (Beginning) (1F, 1W) Fuller
69. Badminton (Advanced) (1F, 1W, 1Sp) Downs
70. Tap Dancing (Beginning) (1F, 1W, 1Sp) Fuller
71. Tap Dancing (Intermediate) (1F, 1W) Fuller
72. Social Dancing (Beginning) (1F, 1W, 1Sp) Fuller
73. Golf (Beginning) (1F, 1Sp) Staff
74. Life Saving. Prerequisites: Red Cross Swimmers Card or permission of instructor. American Red Cross Certificate is given to students who pass the examination. (2F, 2W) Rasmussen
76. Social Dance (Advanced) (1F, 1Sp) Staff
88. Golf (Advanced) (1Sp) Staff
82. Tennis (Advanced) (1Sp) Staff
90. Tennis (Intermediate) (1Sp) Staff

Professional Courses in Physical Education

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

20. Fundamentals of Sports. Designed to develop the fundamental skills of tennis and archery. (1F) 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 minor ing in Physical Education. (1F) Fuller
26. Dance Laboratory. Tap dancing for freshman and sophomore women majoring or minor ing in Physical Education. (1Sp) Fuller
30. Fundamentals of Sports. Designed to develop the fundamental skills of boxing, weight training and wrestling. (1F) Staff
31. Fundamentals of Sports. Designed to develop fundamental skills of tumbling, gymnastics and trampoline. (1W) Staff
32. Fundamentals of Sports. Designed to develop the fundamental skills of volleyball and speedball. (1Sp) Staff
75. Introduction to Physical Education. An introduction to the history, philosophy, theory and practice of Physical Education. (2F) McClellan
77. Dance Laboratory. Techniques of Elementary modern dance for freshman and sophomore women majoring or minor ing in Physical Education. (1F) Fuller
78. Dance Laboratory. Techniques of intermediate modern dance for freshmen and sopho more women, majoring or minor ing in Physical Education. (1W) Fuller
79. Dance Laboratory. Techniques of advanced modern dance for freshmen and sophomore women majoring or minor ing in Physical Education. (1Sp) Fuller
81. Rhythms and Dramatic Games. Rhythms for young children: its use in creative movement. Methods of presenting and developing rhythms are studied. (2F) Fuller
86. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating football, touch football, basketball, wrestling and boxing. Attention is also given to the proper instruction of other game officials such as timers, scorers and game administrators. (2F) Mendini
Physical Education. (3 F, Wl D. Nelson
Physiological principles are then applied to the human body in various kinds of activity. Physiological functions of physiological changes that occur during all kinds of activity. The course includes a study of the physiological functions of the human body in terms of its use in activity; methods of officiating basketball officiating 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) Pearce

96. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of softball and field hockey. (1Sp) Downs

98. Physical Education Laboratory. Fundamentals of individual sports for lower division women majoring or minoring in Physical Education. (1Sp)

102. Dance Composition. Composition based upon the elements of direction, level, and dimension. Experience in individual and group composing. (2F) Fuller

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

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

106. Kinesiology. 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. Prerequisite: Physiol 20. (3W) D. Nelson

107. Physiology of Muscle Activity. 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 functions of the human body in various types of activity. Physiological principles are then applied to Physical Education. (3F, W) D. Nelson

108. Adapted Physical Education. Basically a study of the adapted Physical Education program. Includes the administration of an adapted Physical Education program. Also a study of abnormal problems in body mechanics, athletic injuries and their treatment, athletic training procedures, and principles dealing with abnormal conditions found in the physical education program. Prerequisite: Physiol 20. (3Sp) D. Nelson

111. Creative Rhythms for Schools. Methods and materials used in guiding creative rhythmic experiences of students. Material applicable to elementary or secondary school. (5W) Fuller

113. Construction of Physical Education Equipment. Construction of and practice in the use of rhythmic instruments and play equipment. (3Sp) 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. (3F, W) Downs

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. (2Sp) Staff

123. Techniques in Physical Education. Designed to develop teaching techniques in gymnastics, tumbling and trampoline. (2Sp) Staff

124. Water Safety Instructor's Course. Prerequisite: American Red Cross Senior Lifesaving certificate and permission of the instructor. Attention is given methods of teaching swimming, diving, lifesaving and use of small water crafts. American Red Cross certification is given students who pass the exam. (2W, 2Sp) Rasmussen

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

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

151. Techniques of Dance. Techniques of a variety of dance types, with emphasis on ballet and modern. (2Sp) Staff
124. College of Education

153. Leadership in Dance. An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. Prerequisite: one quarter of social or square dancing. A syllabus is required. (2Sp) Staff

160. Techniques in Physical Education for Women. Designed to develop teaching techniques in soccer, speedball and volleyball. (2F) Pearce, Staff

161. Techniques in Physical Education for Women. Designed to develop teaching techniques for officiating basketball and pep club activities. (2W) Pearce

162. Techniques in Physical Education for Women. Designed to develop teaching techniques in softball and field hockey. (2Sp) Pearce

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

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

182. Materials and Methods in Elementary Physical Education. Designed to gain an understanding of the elementary school Physical Education program. Curriculum, facilities, equipment, and the teaching of activities are emphasized. Emphasis is also placed on activities as specified in the Utah State Course of Study for the elementary school. (3W, 3Sp) Downs

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

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

188. Methods in Football. Fundamentals of football, theory and practice; details of each position on the team; training, and managing; complete technique of developing offensive and defensive tactics. (2W) Knap

189. Methods in Basketball. Coaching and training of basketball teams; emphasis on the psychology of the game; methods of defense and offense. (2F) Andersen

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. (3Sp) Maughan

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

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

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, 3Sp) Burnett

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

124. Scoutmaster’s Basic Training Experience. The standard training course approved by the National BSA Council and includes the following: Plans and methods in organization and leadership, program planning, meetings, hiking, and camping. (2Sp) Mendini

157. Field Work in Recreation. Practical experience in conducting social recreational activities, such as for church, school and civic groups. Prerequisite: PE 83. Credit arranged (F, W, Sp) Burnett

175. Winter Survival and Recreation. Lectures and field trips to teach students ways of living in the wilderness under adverse weather conditions and how to participate and enjoy outdoor, winter sports. Students must provide adequate clothing for field trips. (3W) Burnett

178. Problems and Trends in Outdoor Recreation. Problems associated with providing adequate outdoor recreation opportunities. A study of (1) past and present trends in the availability and use of outdoor recreation areas, (2) types of outdoor recreation areas and the present and future needs for each type, (3) the roles of different agencies in providing outdoor recreation, including federal, state, and local government agencies, as well as private and commercial agencies, (4) laws governing the recreational usage of outdoor areas. (3Sp) Burnett

179. Camping and Camp Craft. Training in camp techniques and camp leadership. Different types of camps and their organization, supervision, equipment and safety. Several short hikes and an overnight camp are conducted during the course. (2Sp) Mendini

196. Organization of Recreation. Problems of organization and administration of community recreation departments, including staff, faciliti-
ties, program of activities, and office management. Problems of recreation surveys, legislation, property acquisition, finances, construction and maintenance, and securing community and school co-operation in a united recreational program. (3Sp) Burnett

Professional Courses in Health Education

55. Safety and First Aid Instruction. Standard and Advanced American 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. (2F, W) Mendini

105. 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, Sp) D. Nelson

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. (3Sp) Fuller, Staff

136. Medical Self Help. Course designed to provide information and training that will help prepare students for survival in time of national disaster when services of a physician or other allied health personnel are not available. Radioactive fallout and shelter, healthful living in emergencies, care of sick and injured, as well as standard first aid procedures will be covered. (2F, W, S) Mendini

145. Alcoholism and Education. The alcohol problem is considered from the physiological, psychological, sociological, educational, historical, and legal aspects. The development of a correlated attack on the problem is emphasized. (3Sp) D. Nelson

154. First Aid Instructors Course. Prerequisite, American Red Cross Advanced First Aid Certificate. Attention is given to methods of teaching First Aid. Detailed demonstration and practice is given. American Red Cross First Aid Certificate is given to students who pass the examination. (2Sp) Mendini, Staff

158. Curriculum Development in Health Education. Topics: The scope and socio-scientific basis for health education; organization for health education development; emphasis on the scheduling and sequence of health instruction in primary grades, intermediate grades, junior high school, high school, and health education in college: and, evaluation of outcome. (3) Pearce

163. Methods and Materials in Health Education. The nature of Health Education in the school and community; the health needs of the school child; the health education curriculum; Methodology in the teaching of health; the resource materials of health education; and the measurement and evaluation of the total health program. (3) Pearce

181. Interpretation of the Health Examination. Examination procedures, the detection of physical defects, the general assessment of the health of the individual, and the follow-up program. (3Sp) Staff

Graduate Courses in Physical Education

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

271. Research and Thesis Writing. Credit arranged. Staff

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) McClellan

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, 3Sp) D. Nelson

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

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

299. Physical Education Seminar. The group is offered the opportunity of investigating selected bodies of knowledge in Physical Education and discussion materials grow from the depth of investigation. Credit arranged. (W) Hunsaker
Library Science

Head: Associate Professor Milton C. Abrams
Office in Library 121

Associate Professor Ida-Marie Logan; Assistant Professors D. LaMont Chappell, Anna Marie Smith, R. Kent Wood; Instructors Jeanne Dorland, Gene Garfield, Kaarlo Mustonen, Mark Sorensen.

The program in Library Science is designed to prepare persons for positions in school, public and university libraries not requiring advanced degrees, as well as providing the prerequisite courses for study at graduate library schools. Library Science may be used as a minor in connection with a major in any subject. A teaching minor of not fewer than 20 credits may be selected from the Library Science courses including Library Science 100, 120, 150, and 155.

Persons planning careers in school librarianship must meet teacher certification requirements in addition to completing required courses in librarianship. A person may choose to meet the dual certification requirements in Education and Library Science for certification at both elementary and secondary school levels.

Courses required for Elementary Library Certificates are English 122, Library Science 120, and 150; for Secondary Library Certificate, Library Science 120, 150 and 155.

Recommended courses from other departments for students of Library Science are: Education 107, 147, 161, and 162; English 122, 123, 151 and 154; Speech 118; Office Administration 65; Political Science 151 and 152. See departmental listings for course descriptions.

Library Science Courses

50. Reference Materials. A study of the essential reference work sources in general subject areas. Includes the uses of dictionaries, encyclopedia, yearbooks, handbooks, periodical indexes, and the more important subject and trade bibliographies. (3F, W, Sp, Su) Logan, Garfield, Sorensen, Dorland

100. Advanced Reference and Bibliography. This course is designed to build a knowledge of the scope, significant characteristics, principles and philosophy of information retrieval and bibliographic techniques. Each student is given the opportunity to explore the literature and important reference tools augmenting the major disciplines. (5W, Su) Logan

110. Public Documents. The study of bibliographies, catalogs, indexes, and other sources which are the keys in using public documents. Federal, state, and United Nation documents which constitute vast sources of knowledge will be introduced to potential librarians, teachers, and other interested persons. (3F, Sp) Mustonen

120. Technical Library Processes. Fundamentals, methods, techniques, functions and administrative organization of the Technical Services Departments (Order, Serials and Cataloging) with emphasis on a thorough study of the Dewey Decimal Classification Scheme. (5F, Sp, Su) Mustonen

150. Library Organization and Administration. A study to develop understanding of the organization of the several types of libraries and techniques useful in the administration of libraries generally. Special emphasis is placed upon activities in the school and public libraries. (5W, Su) Wood, Chappell

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 100, 120, and 150. Credit arranged. (F, W, Sp, Su) Smith, Wood

158. Workshop in Librarianship. Designed for teachers, librarians, and administrators to study the current needs of libraries in schools and communities in relation to the problems of education and the institutions served. Resources and organization of new media, development techniques for implementation of the instructional materials center concept, as well as a review of the new books, magazines, and related materials will be stressed. (2Su) Staff


170. Readings and Conference. Provides for individually directed study. Limited to Library Science Minors. Prerequisite: Instructor's Consent. Credit arranged. (F, W, Sp, Su) Staff

Department of

Psychology

Head: Professor Helmut Hofmann
Office in Education 302

Professors Walter Borg, Arden N. Frandsen, Heber C. Sharp, David R. Stone; Associate Professors Philip Langer, Peter Wolff, E. Wayne Wright; Assistant Professors John Doidge, Ronald Peterson.

Psychology 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 or Doctorate degree, in Psychology should prepare students professionally (1) for research and/or college teaching; (2) for guidance and counseling positions; (3) for school psychology services in elementary, secondary and special education programs; (4) for clinical work; (5) for individual and personnel work in private and government agencies. Psychology is also a suitable major for students 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, the Wyoming State Mental Hospital, the State Industrial School, by which graduate students and some seniors can have practical experience in counseling and clinical psychology.

Lower Division Preparation for Psychology. The best preparation for Psychology is basic training in physical and biological science, social science, mathematics and literature. In completing the group requirements, it is recommended that the following courses be included: Physiology 4, 121, 122; Zoology 112; Sociology 70; English Literature (novel and biography) courses; Physics 6, 17, 19, or 21; 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, 112, 127, 140, 161, 171, 174, 175, 180, and 181; and approved courses from Psychology 106, 123, 155. Recommended upper division electives: Sociology 90, 153; Education 186; Speech 167; Zoology 112, 119; Physiology 104 or 121, 122; the Education courses for teacher certification: SW 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 should include Psychology 53, 71, 100, 112, and six hours from the following: 127, 140, 161, 171, 175, 180, and 181.

Graduate Study

Master of Science Degree in Psychology. Providing for specialization at the Masters degree level, the Utah State University Department of Psychology (and Guidance) offers the Master of Science and Master of Arts degrees in nine areas: (1) General, (2) Child, (3) Educational, (4) School Psychologist, (5) Counseling, (6) Animal Behavior, (7) Physiological Psychology, and (9) Learning and Motivation.

In addition to these nine areas in Psychology, a course of study leading to the Master of Science degree in Guidance is outlined below.

Master of Science Degree in Guidance. A teaching certificate and 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 186, 128, 262; and Psychology 123 or 140, 181, 200, 202, or 205, 212, 280, 282, 283, 284, 287, 288, 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. The Department of Psychology in cooperation with the Department of Education, has planned a program of advanced graduate study in counseling, school psychology that leads to the EdD degree in Educational Psychology. The program requires two years of graduate study, including supervision of individual study, beyond the MS degree, and an internship in school, mental hygiene clinic, or social agency.

PhD Programs in Psychology. The department offers PhD programs with specialization in the following areas:

1) Animal Behavior
2) Child and Developmental Psychology
3) Learning and Motivation
4) Physiological Psychology
5) Social Psychology

For a description of the programs contact the Department Head or the Dean of Graduate School.

Committee approval for entrance into any one of these graduate programs is based upon appraisal of (1) the students undergraduate
transcript: (2) scores on the Departmental Comprehensive Test in Psychology, and (3) scores on the Graduate Record Examination.

Psychology Courses

20. Spelling Clinic. The application of programmed techniques to adult spelling improvement. Individual instruction based on diagnostic testing. (1F) Stone

53. Elementary General Psychology. Principles of behavior of organisms, including: scientific methodology in psychology, the biological basis of behavior, conditioning and learning, perception and thought, child development, personality, abnormal psychology, and industrial psychology. For any lower division student. (5F, W, Sp, Su) Staff

60. Personal Study Efficiency. Designed to evaluate self-concept as a major factor in study, with discussions of concentration, motivation, and goal-setting in study, study techniques, and personality factors in study. (2F, W, Sp) Petersen

71. Experimental Psychology. A laboratory course of the scientific methods used in the study of behavior. Prerequisites: Psychology 53. (3F, W, Sp, Su) Wolff, Staff

80. Reading and Study Skills. A practical course, highly individualized, designed to aid in improving the efficiency of reading and study skills. Individual appointments arranged. (2F, W, Sp) Stone

100. Human Growth and Development. A study of the developmental characteristics and processes of human physical and psychological development from birth to maturity. Prerequisite: Psy 53. (3F, W, Sp, Su) Staff

106. Educational Psychology. A study of the principles of learning in teaching and of the abilities and other relevant characteristics of children and adolescents on the basis of which elementary and secondary teachers can evaluate and/or develop conditions of effective learning. Prerequisite: Psychology 53. (3F, W, Sp, Su) Frandsen and Stone

112. Application of Statistics to Education and Psychology. Elementary study of statistical procedures in handling test scores and other data, and of the concepts needed to read current educational and psychological literature. (3F, W, Sp, Su) Borg, Frandsen, Sharp

120. Improving Personal Reading Efficiency. Designed to help adults improve their methods of reading. Stresses improvement in organization and comprehension skills, and the ability to flexibly adapt speed to the material and needs of the reader. (3Su) Stone

123. Psychology of Exceptional Children. The development and behavior characteristics of exceptional children. The education, home management, social control, and psychological treatment suited to their needs. Groups included are the mentally deficient, physically handicapped, the exceptionally gifted, and children having serious personality and conduct problems. (3F, W, Sp, Su) Halstrom, Hofmann

127. Psychology of Learning. A comprehensive study of descriptions and explanations of learning. Prerequisites: Psychology 53 and 112. (3F, Sp, Su) Dodge, 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. (3Sp) Sharp

145. Mental Hygiene. For teachers and other workers in social occupations. Designed to promote understanding of emotional and social adjustments, and as a basis for guiding children, adolescents and adults toward improved mental health. Prerequisite: Psychology 53. (3W) Sharp

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

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. Prerequisites: Psychology 53. (3F, Sp, Su) Sharp

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

171. Advanced Experimental Analysis of Behavior. The course will emphasize methods and procedures which enable psychologists to manipulate behavior. Current research methods will be emphasized and demonstrated. Nonstatistical analysis of behavior will be emphasized. Prerequisite: Psy 71 or equivalent. (3W) Wolff

174. Sensory Basis of Behavior. An introductory course into the sensory basis of behavior to include study and experimentation on psychophysical methods, anatomy of receptors, physiology of receptors and central nervous system basis of sensation. (3W) Wolff

175. Physiological Psychology. Physiological mechanisms underlying behavior. Prerequisites: Psy 53 and 71. (3Sp, Su) Wolff

181. Psychometrics Applied to Guidance. The evaluation, interpretation, and use of tests of intelligence, aptitudes, interests, personality, and adjustment. Prerequisite: Psychology 53 and 112. (5F, Su) Frandsen

191. History and Systems of Psychology. History of psychology and a critical comparison of the several systematic points of view on major problems in psychology. (3Sp) Sharp


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. Prerequisites: Psychology 53. (3Sp, Su) Langer, Hofmann

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, Su) Frandsen, Hofmann

212. Advanced Applications of Statistics to Education and Psychology. This second course covers analysis of variance and covariance, varied correlation techniques, partial and multiple correlation, and non-parametric methods. Prerequisite: Psychology 112. (3W, Su) Borg

214. Independent Readings in Psychology. For students who cannot participate in the discussion in Psychology 215, this course provides opportunity for independent readings and conferences on topics individually selected. Prerequisite: prior course in the area of the topic selected. (2F, W, Sp, Su) Staff

215. Seminar Discussion of Current and Special Topics in Psychology. Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or periodical literature on a specialized topic, selected according to student's interest. May be taken 1, 2, or 3 quarters. (2F, 2W, 2Sp) Staff

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

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


227. Theories of Learning. An integration and synthesis of the literature. A comparison and evaluation of alternate operational and theoretical explanations of learning. (3) Stone

235. Theory and Practice of Play Therapy. Exploration of theories and potentialities of specialized play therapy experience. Concepts and principles in the interpersonal process are examined and developed. (3F) Hofmann

238. Practicum in Play Therapy. Direct experience with children in the play therapy situation. Prerequisite: Psychology 235. (2F, W, Sp, Su) Staff

261. Advanced Social Psychology. Experimental and theoretical studies of selected current topics in social psychology—including group behavior, motivation, reactions to frustration and conflict, attitude measurement, personality development, and cultural aspects of behavior. Prerequisites: Psychology 112 and 161. (3W) Langer

264. Experimental Social Psychology. A review and critique of the experimental literature in certain selected areas of social psychology. Students will be required to prepare and carry out an experiment in one of these areas. Prerequisites: Psy 261, 212. (3W) Langer

265. Culture and Personality. A study of the relationship between various cultural systems and their effect on personality. Various theoretical orientations will be reviewed including psychoanalytic theory, general behaviorism and field theory. Prerequisite: Psy 261. (3Sp) Langer

266. Introduction to Research in Education. See Ed Adm 266. (3F, Sp, Su) Carlisle, Borg

267. Research in Psychology on Education. See Ed Adm 267. (3F, Sp, Su) Borg
271. Seminar in Conditioning Techniques. The course will emphasize current research in respondent and operant conditioning. The student will be responsible for an independent survey of the literature or an independent experimental demonstration. (3W) Wolff, Staff

274. Advanced Sensory Basis of Behavior. An advanced course in sensation concentrating on the physiological basis of sensation. This course is designed for the graduate student in physiological psychology. It is a survey of current research in both the cellular and gross physiological basis of sensation. Prerequisite: Psy 174. (5W) Wolff

275. Advanced Physiological Psychology. Neuraneatomy and neuropysiological basis of behavior. A survey of brain and behavior from the cellular level up. Current research in neuropsychology will be emphasized. Prerequisite: Psy 174, 175. (3Sp) Wolff

276. Comparative Psychology. A phylogenetic study of animal behavior. Comparing naturalistic and experimental findings. (3W) Staff

278. Individual Diagnostic Intelligence Testing. Techniques of individual testing, including intensive practice in the administration and interpretation of (a) the Stanford-Binet and Wechsler's intelligence scale for children, in the examination of school-age children, and (b) Wechsler's adult intelligence scale for use with adolescents and adults. Prerequisite: Psychology 181. (3W, Su) Frandsen

283. Principles and Techniques of Counseling. Principles and techniques of counseling students on problems of curriculum planning and vocational choice, on improving methods of study, and emotional and social adjustment. Prerequisites: Psychology 58, 102 and Education 128. (3F, Su) Wright

284. Theories of Counseling. An advanced study of the theories of counseling, to develop greater understanding of and a more effective approach to counseling. Prerequisite: Psychology 283. (3W, Su) Wright

285. Introduction to Projective Methods of the Study of Personality. The dynamics of human adjustment and the common projective methods for revealing motives, attitudes, and adjustment mechanisms of children and adults. Prerequisite: Psychology 181. (3Sp, Su) Frandsen

287. Occupational Information. Collection, classification, and uses of occupational information in counseling. (3W) Peterson

288. Practicum in Counseling. Supervised practice in counseling in elementary or secondary schools, in the University or in clinical or guidance agencies. Prerequisites: Psychology 181. 284. (2F, W, Sp, Su) Wright, Peterson

289. Practicum in Psychological Testing. Supervised practice in psychological testing in elementary or secondary schools, in the university, or in clinical or guidance agencies. Prerequisite: Psy 282. (2Sp) Frandsen

290. Seminar 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, Sp) Staff

293. 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, Sp) Staff

298. Advanced Child Psychology. A critical and creative approach to the study of the nature and factors affecting child development, including the consideration of theories, experiments, and proposed new studies in the field. (3W) Hofmann, Frandsen

300. Educational-Psychological Theories in Practice. From observance and wide reading of educational-psychological theories—on motivation, learning, individual differences, personality, interpersonal relations, evaluation, etc.—hypotheses are formulated for checking by observation in selected school situations, both at the elementary and secondary levels. (3W) Frandsen

305. Advanced Child Psychology. A critical and creative approach to the study of the nature and factors affecting child development, including the consideration of theories, experiments, and proposed new studies in the field. (3W) Hofmann, Frandsen

310. Educational Diagnosis of Learning Difficulties. Principles from educational psychology applied to the diagnostic study of the difficulties students have in learning reading and other subjects. (3Sp) Stone

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

315. Doctoral Colloquium. A colloquium on advanced theories and research in psychology. Required of all PhD and EdD candidates. (3Sp) Hofmann

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

323. Advanced Exceptional Child. A critical and creative approach to the study of the characteristics, education, and guidance of exceptional children. (3F) Hofmann

381. Advanced Psychometrics. A critical and creative approach to an evaluation, interpretation, and uses of tests of intelligence, aptitude, interests, personality, and mental health. (5F) Frandsen

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

387. Clinical Internship. A clinical internship for doctoral candidates in which advanced testing, diagnosis, and the writing of psychological protocols is practised in mental hospitals, mental health clinics and child guidance centers. Administration and interpretation of mental tests, projective tests and aptitude tests will be supervised by clinical psychologists in the center and by departmental staff. Financial support by the center for selected candidates will be available. Approved centers: Cache County Mental Health Clinic, Utah State Industrial School, Ogden, and Wyoming State Mental Hospital, Evanston, Wyoming. (3-6F, W, Sp, Su) Sharp, Hofmann, Doldge

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

Department of
Secondary Education

Acting Head: Associate Professor Terrance Hatch
Office in Education 206

Professors John C. Carlisle, Dean, College of Education, Eldon Drake; Associate Professor A. L. Braswell; Assistant Professors Leon Beutler Pearl S. Budge, Creighton Delaney, John Haas, Robert Hammond, H. Dale Rasmussen, Robert E. Wiper.

The function of the Department of Secondary Education is to aid in the preparation of teachers, supervisors, administrators, and other professional personnel for careers in secondary education.

Undergraduate Program

The Department, in cooperation with the College of Education and with other departments and colleges of the University, offers the Bachelor of Science and Bachelor of Arts Degrees with a major in Secondary Education; and cooperates with other departments of the University, which graduate students with secondary teaching majors, in providing the professional education courses necessary for certification. The secondary certificate qualifies the candidate to teach in junior and senior high schools (grades 7-12).

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) Lower Division Group Requirements.

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<tr>
<th>Natural Science</th>
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<tr>
<td>Biological Sciences</td>
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<td>Exact Sciences</td>
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<td>Humanities</td>
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<td>Social Sciences</td>
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<td>Psychology 53</td>
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<td>Basic Communications</td>
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<td>Physical Education</td>
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(2) Teaching Major and Minor.

An approved teaching major of not fewer than 36 credits, of which 15 must be upper division, and an approved teaching minor of not fewer than 24 credits, must be completed. In lieu of a teaching major and minor, a composite teaching major consisting of not fewer than 60 credits in two or more related sub-
jects 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. For a list of approved programs consult the handbook on Approved Teaching Majors and Minors in Secondary Education. Students completing a teaching major and minor may graduate in either the department offering that major or the Department of Education. Individuals completing a composite major usually graduate from the Department of Education.

(3) Admission to Teacher Education. Regardless of the department in which the student majors, he must apply and be granted permission to enter the Teacher Education program by the Admissions Committee of the Department of Education. It is advisable for the student to make this application at the end of the Sophomore or the beginning of the Junior year.

Students are not permitted to enroll in professional courses in secondary education unless they have been admitted to the Teacher Education program, nor will a student be admitted to student teaching 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 stay off campus during the time he is student teaching.

(4) 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 9 credits)
Public Health 155 .................................. 3
Psychology 100 .................................... 3
Psychology 106 .................................... 3

Group II. Understanding the School (minimum of 6 credits)
Education 126 .................................... 3
Education 150 .................................... 3

Group III. Student Teaching, Methods and Curriculum (minimum 15 credits)
Education 127 .................................... 3
Education 129 .................................... 5
Education 130 .................................... 4

Group IV. Special Methods (minimum 3 credits)
Students are required to take the special methods course in a teaching major if it is offered. The special methods course in the minor field is also recommended.

Elective Courses

Additional courses may be elected in each of the four 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 Secondary Education.

Dual Certification. A student desiring to obtain both the elementary and the secondary certificates should consult with an adviser in the Secondary Education Department early in his program. Ordinarily, dual certification will require at least one additional quarter of work.

To qualify for a secondary certificate, in addition to meeting requirements for the elementary certificate, candidates must (1) complete the
requirements for a composite teaching major or for a teaching major and minor as indicated above; and (2) complete 15 credits required for certification in secondary education, including Education 127, and a special methods course in either the teaching major or minor, and Education 130.

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

Graduate Program

The Department of Secondary Education as an integral part of the College of Education assists in the preparation of graduate students seeking the MEd, MA, and MS Degrees, the Diploma in Administration or Curriculum and Supervision, and the EdD Degree. The Secondary Education Department specifically offers the MEd, MA, and MS in teaching, and the EdD in Curriculum and Supervision. Students desiring information concerning the various graduate programs should write to or consult with the department head and write to Dean, School of Graduate Studies, for a graduate catalog which contains the details on the various graduate programs and making application for admission to a graduate program.

Secondary Education Courses

Undergraduate


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 Ed 129 and 130. (3F, W, Sp, Su) Budge, Haas, Drake, Delaney

128. Principles of Guidance. Emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W, Sp) Noble, Himes

129. Student Teaching in the Secondary Schools. Members of the class are assigned to a sponsor teacher in secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until, upon completion of the assignment, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. Prerequisites: Psy 100, 102 or 106 and Ed 128. (5F, W, Sp, Su) Staff

130. Student Teaching in the Secondary Schools. Members of the class are assigned to a sponsor teaching in secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until, upon completion of the assignment, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. Prerequisites: Psy 100, 106 and Ed 128. (4F, W, Sp, Su) Staff

131. Student Teaching in Higher Education. Enrollment by permission only. Especially adapted to instructional assignments of graduate assistants, laboratory instructors, or other graduate students who might be specifically preparing for college teaching. (4W, Sp) Himes


135. Teaching English in the Junior and Senior High School. Considers the content of the English course, effective methods, and significant trends. (4F, W, Sp, Su) Budge

145. Teaching Science in Secondary Schools. Aims and objectives of science education in the secondary schools and the development of curriculum materials to achieve these aims. Class members develop teaching units in science taught in the secondary school. (3F, Sp, Su) Braswell

146. Laboratory Practicum for Secondary Science Teachers. Lecture and laboratory experience provides initiation into investigative laboratory techniques and procedures appropriate for the new high school science curricula. (3W, Su) Braswell
147. Improvement of Reading in Secondary Schools. A study of research and classroom practices is designed to assist secondary school pupils with low reading abilities. For English teachers and those wishing to qualify for remedial reading certificates. (3W, Su) Budge

150. The American School System. See Educ Adm 150 (3F, W, Sp, Su)

Ballam, Hansen, Noble

161. Audio-Visual Education. Studies the building of a program in which the newest materials and techniques are utilized. Preparation of audio-visual material. (3F, W, Sp, Su) Drake, Reutler

162. Audio-Visual Techniques. An advanced course designed to prepare students in the operation, care and maintenance of Audio-Visual equipment. The construction and proper utilization of teaching aids in the classroom will also be emphasized. (3Su) Drake

163. New Media in Education. The development, organization, and use of such new media as television, teaching machines, programmed learning in the public schools. Ways and means of organizing for team teaching will be considered. (3F, W, Sp, Su) H. Johnson

164. Measurement and Evaluation in Education. Evaluates procedures in education including principles of measurements, tests, and text construction. The development of more valid and objective teacher made tests will be studied. (3F, W, Sp, Su) Borz, Himes

166. Diagnosis and Treatment of Learning Difficulties. See Special Education 166. (3F, Sp, Su) Stone

Secondary Courses Offered In Other Departments

Applied Linguistics for Teachers (See Lang Fr 113, Gr 112, Sp 112).

Methods in Physical Education (See PE 120).

Teaching of Speech (see Speech 123).

Art Methods (See FA-A 152).

Music Methods (FA-M 151, 152, 153).

Teaching of Mathematics (See Math 175).

Business Education Methods (See BE 178, 179).

Graduate Courses

230. Secondary School Curriculum. A study of the secondary school curriculum, junior and senior high school, as it now exists in typical schools, together with proposals for improvement. (3F, Su) Delaney

232. Aerospace Education. An introduction to aerospace for teachers in elementary and secondary schools, to include such content areas as: (1) a study of the principles of flight; (2) knowledge of the earth’s atmosphere; (3) the control of aircraft in flight; (4) information on the federal airways and airports; (5) the principles of jet propulsion; and (6) an introduction to the U.S. Space Program. Each member of the class will be afforded the opportunity to take an orientation flight, and will also receive some basic instruction in handling an aircraft in flight. Nationally known speakers will be used as resource specialists throughout the course. (3Su) Summers

233. The Junior High School. Formerly 217. A study of the junior high school as it has developed as a distinct segment of the American Public School system, its functions, organization and curriculum, together with recommendations for improvement. (3Su) Delaney, 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. (2Sp, Su) Carlisle

240. Improvement of English in the Junior and Senior High School. An advanced course for experienced teachers. Evaluates significant changes in content and methods as revealed by formal research and successful practice. (3Su, W) Budge


242. The Improvement of Science in the Secondary School. For experienced teachers. Deals with newer concepts in curriculum and methods of instruction in physical and biological sciences in the secondary school. (3Sp, Su) Bruswell


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and methodology in the light of desired objectives. Prerequisite: Ed 134. (3F, W, Sp) Haas

259. Supervising Student Teaching. Considers ways and means of providing desirable experiences for student teachers in the public schools. The role of the classroom teacher and the college supervisor will be analyzed. (3F, Su) Budge, Shaw, Wiggins

264. Instructional Leadership in Education. Principles and practices of school supervision, including qualifications and responsibilities of supervisors of instruction in public education. The role of the principal, the curriculum director and other administrators in instructional leadership will be considered. (3W, Su) Allred

266. Introduction to Research in Education. See Educ Adm 266. (3F, Su) Carlisle

267. Research in Psychology and Education. See Educ Adm 267. (3F, Su) Borg

283. Reading and Conference. Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su) Staff


366. Internship in School Supervision. Provides extensive experience for the advanced student working on the Doctor of Education Degree in Curriculum Development and Supervision. The student works a minimum of one quarter full time under the direction of an administrator, in a public school or University. Credit arranged. (F, W, Sp) Staff

385. Field Studies and Thesis. Formerly 376. Individual work on research problems in the EdD program. Credit arranged. (F, W, Sp, Su) Staff

Department of Special Education

Acting Head: Professor Helmut Hofmann
Office in Education 302

Professors Heber Sharp, David R. Stone; Associate Professor Frances Halstrom; Assistant Professors Gail Johnson, Phyllis Publicover; Instructor Robert Publicover.

The Department of Special Education offers a wide range of training opportunities for teachers, supervisors, research workers, future college teachers, psychologists and social workers. Programs on the undergraduate and the graduate level lead to specialization in three areas:

- Mental Retardation
- Emotional and Social Maladjustment
- Remedial Reading

State certification for teachers in these three areas can be obtained within the undergraduate or graduate course sequences.

Undergraduate

For a minor in Special Education for prospective elementary and secondary teachers, a minimum of 18 credit hours are required from the following courses:

- Ed. 185 Arts and Crafts for Mentally Retarded ........................................... 3
- Ed 186 Diagnosis and Treatment of Learning Difficulties .......................... 3
- Ed 187 Curriculum for Mentally Retarded ..................................................... 3
- Ed 191 Student Teaching in Special Education ............................................. 6

(Prerequisites: Ed 105, Principles of Teaching in the Elementary School: Ed 106, Student Teaching
in the Elementary School; or Ed 129 and Ed 130, Student Teaching in Secondary Schools.)

Ed 289 Diagnosis of Mental Retardation ........................................ 3
Psy 123 Psychology of Exceptional Children ........................................ 3
Psy 181 Psychometrics ................................................................. 5
Total .......................................................................................... 23-26

Graduate

The Department offers a Master's degree program with specialization in three areas:

Mentally Retarded
Emotionally Disturbed
Remedial Reading

A total of 45 quarter hours is the minimum requirement for these degrees. Course work must be completed in a seven-year period, and a minimum of 18 hours must be taken on the Logan Campus. Of the 45 hours, 25 are required in the 200 series.

a. Course list for the area of Mentally Retarded

Ed 184 Curriculum for the Trainable Mentally Retarded.
Ed 185 Arts and Crafts for the Mentally Retarded.
Ed 187 Curriculum for Mentally Handicapped.
Ed 191 Student Teaching in Special Education.
Ed 186 Diagnosis and Treatment of Learning Difficulties.
Ed 266 Applied Research in Education.
Ed 267 Research in Psychology and Education.
Ed 286 Research and Thesis Writing.
Ed 287 Basic Problems in Teaching Mentally Handicapped.
Ed 288 Counseling of Parents of Exceptional Children.
Ed 289 Diagnosis of Mental Retardation.
Ed 291 Identification of Emotionally Handicapped.
Psy 123 Psychology of Exceptional Children.
Psy 181 Psychology Applied to Guidance.
Psy 200 Principles of Learning in Psychology.
Psy 224 Characteristics of the Mentally Retarded.

b. Course list for the area of Emotionally Disturbed

Ed 186 Diagnosis and Treatment of Learning Difficulties.
Ed 188 Diagnosis of Remedial Reading.
Ed 189 Methods of Remedial Reading Instruction.
Ed 191 Student Teaching in Special Education (Emotionally Disturbed).
Ed 266 Introduction to Educational Research.
Ed 267 Research in Psychology and Education.
Ed 285 Research and Thesis Writing.
Ed 290 Education for Mental Health in the Classroom.
Ed 291 Identification of Emotionally Disturbed Children.
Ed 192 Education of Emotionally Disturbed Children.
Psy 123 Psychology of Exceptional Children.
Psy 181 Psychometrics.
Psy 200 Principles of Learning.
Psy 235 Theory and Practice of Play Therapy.
Psy 280 Personality.
Speech 167 Fundamentals in Speech Disorders.
FA 161 or 162 Art Methods in Elementary and Secondary School.

c. Course list for the area of Remedial Reading

Ed 186 Diagnosis and Treatment of Learning Difficulties.
Ed 188 Diagnosis of Remedial Reading.
Ed 189 Methods of Remedial Reading Instruction.
Ed 190 Practicum in Remedial Reading.
Ed 225 Improvement of Reading.
Ed 266 Applied Research in Education.
Ed 267 Research in Psychology and Education.
Ed 288 Counseling of Parents of Exceptional Children.
Ed 290 Education for Mental Health in the Classroom.
Psy 181 Psychometrics.
Psy 214 Independent Reading in Psychology.
Psy 235 Theory and Practice of Play Therapy.
Psy 280 Personality.
Engl 122 Children's Literature.
The Department offers a Doctoral program in the general area of curriculum and supervision with specialization in subjects related to Mental Retardation, Emotional Problems and Deprived Children. The EdD and PhD programs in the Department of Psychology can also include a strong minor in the area of Special Education.

Certification

The State of Utah has specified certification requirements for teachers in mental retardation and in remedial reading. These requirements can be met within the coursework for the Masters Degree or by taking the specified courses for the provisional or professional certificates.

Provisional Certificate in Mental Retardation

(To be issued to a person holding a general teacher's certificate and a minimum of 15 hours of specialized training.)

- Psy 123 Psychology of Exceptional Children: 3 hours
- Psy 224 Characteristics of Mentally Retarded: 3 hours
- Ed 185 Arts and Crafts for the Mentally Retarded: 3 hours
- Ed 186 Diagnosis and Treatment of Learning Difficulties: 3 hours
- Ed 187 Curriculum for Mentally Handicapped: 3 hours
- Ed 191 Student Teaching in Special Education: 3-6 hours

Total credit hours required—10 hours (minimum)

Professional Certificate in Remedial Reading

- Psy 123 Exceptional Children: 16 hours

Total credit hours required—16 hours (minimum)

Professional Certificate in Remedial Reading

- Psy 123 Exceptional Children: 10 hours

Total credit hours required—10 hours (minimum)

Special Education Courses, and related courses listed in Departments of Psychology, Fine Arts, Speech, Secondary Education and Educational Administration.

- Hofmann, Publicover, Halstrom
- Dittmer
- Drake, Beutler
- H. Johnson
- Himes

123. Psychology of Exceptional Children. See Psychology 123. (3F, W, Sp, Su)

156. Music for Elementary Schools. See Fine Arts 150. (3W, Sp)


162. Audio-Visual Techniques. See Secondary Education 162. (3Su)

163. New Media in Education. See Secondary Education 163. (3F, W, Sp, Su)


1Education 107. Teaching of Reading, prerequisite for Education 188 and Education 225.
181. Psychometrics. See Psychology 181. (SF)
Frandsen
185. Arts and Crafts for the Mentally Retarded. A laboratory study of methods and procedures of arts and crafts in classroom and instruction for the mentally retarded. (Sp, Su) Laird
186. Diagnosis and Treatment of Learning Difficulties. A study of methods of dealing with learning difficulties in basic educational skills of pupils in the elementary and secondary schools. The emphasis is upon developmental and corrective measures in the typical classroom. (3F, Sp, Su) Stone
187. 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. Psy 123 is a prerequisite or should be taken concurrently. (3F, 3W, Sp, Su) Sharp
188. Diagnosis of Remedial Reading. See Elementary Education 188. (3Su) G. Johnson
189. Methods of Instruction in Remedial Reading. See Elementary Education 189. (3W, Su) G. Johnson
190. Practicum in Remedial Reading. See Elementary Education 190. (3W, Su) G. Johnson
191. Student Teaching in Special Education. Designed to help the teacher apply methods and techniques found to be successful with slow-learning children, emotionally disturbed children, and culturally disadvantaged. The apprentice plan is followed which requires an initial period of observation with minor responsibilities which increase as the student's ability is demonstrated. Enrollment is limited to experienced teachers or students who have completed Ed 106. Students must have completed or be concurrently taking the courses in Psy 123 and Ed 187 or Ed 291. Credit arranged. (F, W, Sp, Su) Staff
201. Reading Readiness for Disadvantaged Children. This course explains methods of overcoming the special reading problems which result from cultural deficiencies or differences. (3Su) G. Johnson
227. Research in Psychology and Education. See Educational Administration 227. (SF, Sp, Su) Borg
228. Personality. See Psychology 228. (3F, Sp, Su) Sharp
229. Individual Diagnostic Intelligence Testing. See Psychology 229. (3W) Frandsen
230. Reading and Conference. Provides for individually directed study in subjects of special interest and preparation. Credit arranged. (F, W, Sp, Su) Staff
232. Curriculum for the Gifted. A study of curriculum designs, special and enrichment programs for gifted students. (3F, Sp, Su) Halstrom
233. Basic Problems in Teaching the Mentally Handicapped. Analysis of the emotional and social aspects of the mentally retarded child as they relate to his perception of himself and of his learning difficulties. The necessity of understanding how these children develop concepts which are essential to their learning will be stressed. Classroom procedures which facilitate the development of such concepts will form the main body of the course. (3Sp, Su) Halstrom
234. Counseling of Parents of Exceptional Children. A study of counseling practices suited for parents of exceptional children. The special psychological problems of these parents will be emphasized. Information on local, state, and national resources for parents and children forms an essential part of the course. (3W, Su) Halstrom
236. Education for Mental Health in the Classroom. Emphasizes the importance of mental health in teaching. Analysis of the concept of the healthy child in the classroom and the conditions which contribute to his growth and development. (5F, Su) Hofmann, Halstrom
237. Improvement of Reading in the Elementary School. See Elementary Education 237. (3F) Allred, Shaw, G. Johnson
238. Practicum in Play Therapy. See Psychology 238. (3W) Hofmann
239. Theory and Practice of Play Therapy. See Psychology 239. (3W) Hofmann

292. Education of the Emotionally Handicapped. Discussion of school programs for emotionally disturbed children. Methods and procedures for these children in regular classroom, special classrooms and institutions will be studied. Field trips to Mental Institutions. Prerequisites: Ed 291. (3Sp, Su)

297. Seminar on Disadvantaged Children. A course for teachers and supervisors of disadvantaged children in which the advanced students will study under a team of professors and will do original work in the fields of curriculum, community action programs, tests and measurements, legal and administrative aspects of programs for disadvantaged children. (3Sp, Su)

Staff
College of Engineering

Department of Agricultural and Irrigation Engineering, 146
Department of Civil Engineering, 149
Department of Electrical Engineering, 155
Department of Industrial and Technical Education, 159
  Industrial Teacher Education, 159
  Industrial Technology, 161
  Technical Education, 163
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Department of Mechanical Engineering, 175

Degrees Offered:
  Bachelor of Science
  Master of Science
  Master of Industrial Education
  Civil Engineer
  Irrigation Engineer
  Doctor of Philosophy
  Doctor of Education in Industrial Education*

*Offered jointly with College of Education.
College of Engineering

Dean F. Peterson, Dean
Clayton Clark, Director, Engineering Experiment Station
Vaughn E. Hansen, Director, Utah Water Research Laboratory
Spencer H. Daines, Assistant to the Dean
Kay Jeppesen, Controller’s Representative
Office in Engineering C-110B

The College of Engineering comprises the Departments of Agricultural and Irrigation Engineering, Civil Engineering, Electrical Engineering, Manufacturing Engineering, Mechanical 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, Manufacturing and Mechanical 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. The Doctor of Education degree in Industrial Education is offered jointly with the College of Education.

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 degrees in Industrial Teacher Education with majors in Industrial Arts, Technical, and Trade and Industrial Education; and Industrial Technology with majors in Aeronautics, Automotive, and Welding. The Master of Science and the Master of Industrial Education are offered in Industrial Teacher Education. The Doctor of Education degree in Industrial Education is offered jointly with the College of Education. Certificates of Completion are awarded in Technical Education with majors in Aeronautics, Automotive, Diesel, Drafting and Welding.

The objectives of the Department of Industrial and Technical Education are to provide compe-
tent industrial teacher educators for secondary and post high schools, and high level technical personnel for employment in industry.

Admission. For general requirements see introductory section of this catalog.

For Engineering, the following high school units are required for admission without deficiencies: English, 4; 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 to complete the Bachelor's degree, except that minor deficiencies may be removed by attendance at Summer Quarter. See “Common Freshman and Sophomore Curriculum for Engineering.” Students having major deficiencies may be placed in a pre-engineering program agreed upon by the Dean. Such students may write to the Dean regarding this program.

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. For graduation in the College of Engineering a 2.0 average is required in engineering courses and the supporting courses in mathematics, physics and chemistry required by the department. Courses in the departmental major for which “D” grades are received should be repeated unless otherwise recommended by the department.

The general University scholastic policy governs the College of Engineering. See “Low Scholarships and Probation” admissions 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 provision of “Graduate Requirements” and “Lower Division Requirements.” In addition they must satisfy the requirements of the prescribed curriculum of their major.

Graduates in the professional Engineering programs, (Agricultural, Civil, Electrical, Mechanical, and Manufacturing Engineering), also must meet the requirements of the Engineers’ Council for Professional Development in the socio-humanistic field. They can do this and satisfy the social science and humanities group requirements of the University by selecting 27 hours from the following groups A and B, with not less than 10 hours in either group:

A. Social Sciences (select from two areas)
   (1) Sociology 70, 90
   (2) Economics 51, 52
   (3) Psychology 53
   (4) Political Science 1 or 10, 101, 102
   (5) History 1, 2, 3, 4, 5, 13, 14

B. Humanities (select from two areas)
   (1) English—any lower division literature course, any upper division literature course with approval of instructor
   (2) Language—any literature course in a foreign language.
   (3) Fine Arts—Music 1, 101, 102, 103; Theatre Arts 1, 10, 100, 102, 104 Visual Arts 1, 2, 3, 4 and 10.
Thiokol Cooperative Program. A student may rotate industrial employment with his education through a joint arrangement with Thiokol Chemical Corp. Inquire at the Dean's office.

Engineering College Honors. An Honors Program provides an opportunity for outstanding students to participate in advanced study or creative investigation beyond the prescribed curricula. See course No. 197 in the departmental listings.

Professional Societies. The College holds institutional membership in:
- American Society for Engineering Education
- American Society for Testing Materials
- American Concrete Institute
- Highway Research Board
- Universities Council on Hydrology
- Student Chapters or Societies include:
  - American Society of Civil Engineers
  - Institute of Electrical and Electronic Engineers
  - American Society of Tool and Manufacturing Engineers
  - American Society of Mechanical Engineers
  - Sigma Tau
  - Theta Tau
  - Industrial Education Club
  - Society of Automotive Engineers
  - American Welding Society
  - Flying Techs Aeronautics

The Engineering Council comprises representatives from the various student organizations and coordinates student activities. Its office is L246 Engineering Building.

Students are encouraged to affiliate with appropriate student societies.

ROTC. Many Engineering College students find satisfaction in serving their country in the Reserve Officers Training Program and as reserve officers after graduation. Junior and Senior ROTC students receive compensation equivalent to a fine scholarship. See "Military and Air Sciences." Professor Arnold Finchum, Room L236 Engineering Building, has been appointed faculty adviser to assist engineering students desiring to take ROTC to work out schedules.

Scholarships, Fellowships and Assistantships. A number of scholarships and assistantships are available to Engineering College students, including Freshmen. Interested high school seniors are encouraged to write to the Dean regarding these. See also "Awards, Honors, Scholarships, and Grants-in-Aid." There are also opportunities for employment on research projects and other activities.

Graduate Assistantships and Fellowships. A number of excellent graduate assistantships, fellowships and scholarships are available in all departments giving graduate work. Assistantships are available both for teaching and research. Application should be made directly to the department concerned. See "Teaching and Research Assistantships."

Research and Graduate Work. The College of Engineering maintains an extensive program of research through the Engineering Experiment Station and the various departments. There are opportunities for graduate students to participate, and many undergraduates find interesting employment in research programs.

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

General Engineering

Students in the Agricultural, Civil, Electrical, Manufacturing, and Mechanical Engineering curricula take the same courses during their Freshman and Sophomore years. Junior and Senior year courses of study are listed under the major departments.

General Engineering Courses

1. Engineering Orientation. A preview of engineering; what engineering is, what engineers do, what attitudes are essential to success, and philosophy of engineering education. (1F, W) Peterson

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

3. Digital computer utilization for engineering students. Introduction to the use of digital computers in engineering problem solving and data processing utilizing assembly processor languages. Prerequisite, Math 35. (2F, W, S) Staff

Common Freshman and Sophomore Curriculum for Engineering

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<th>FRESHMAN</th>
<th>Course</th>
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<td>Basic Communications, English</td>
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<td>ME 21, 22</td>
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<td>Physics 21, 22, EE 71</td>
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<td>Math 40, CE 91, 92</td>
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<td>ME 120</td>
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<td>Econ 51, Humanities</td>
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</tbody>
</table>

1Two credits are given for MS or AS.

Department of Agricultural and Irrigation Engineering

Head: Professor A. Alvin Bishop
Office in Engineering L-272

Professors Jerald E. Christiansen, Irving S. Dunn, Joel Fletcher, Vaughn E. Hansen, Orson W. Israelsen, Emeritus, Cleve H. Milligan, Dean F. Peterson, Dean of College of Engineering; Associate Professors Bruce H. Anderson, J. M. Bagley, Spencer H. Daines, Fred W. Kiefer, Richard E. Griffin, Water Use Extension Specialist, Wayne Ringer, Farm Buildings Extension Specialist; Assistant Professors Yu-Si Fok, Jack Keller; Research Assistant Frank W. Haws; Collaborators C. W. Lauritzen, Lyman S. Willardson; Research Engineers Earl Israelsen; Gaylord V. Skogerboe.

Agricultural Engineering

Agricultural Engineering applies the art and science of engineering principles to the solution of agricultural problems. Basic knowledge from other fields of engineering is utilized in addition to the soil and
Agricultural and Irrigation Engineering 147

water relationships of agricultural production under irrigation. The Agricultural Engineering curriculum at USU emphasizes irrigation and drainage and water supply and utilization. In addition the college of Agriculture offers courses in farm buildings, farm power and machinery, electrification and processing of agricultural products.

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

The four-year program listed here leads to the Bachelor of Science degree in Agricultural Engineering. A five-year program is available for students with inadequate background or those desiring to take Military Science, competitive athletics or part time employment.

Because of the strong emphasis on irrigation, drainage, and water resources, the Agricultural and Irrigation Engineering program is closely integrated with Civil Engineering. Many faculty members serve on the staffs of both departments, and graduate programs are jointly planned to utilize the full resources of both.

Agricultural Engineering Curriculum

Freshman and Sophomore Years
Common to all Engineers
(see College of Engineering Introduction)

<table>
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<th>Course</th>
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<td>CE 84, EE 106, CE 181</td>
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<td>ME 111, 112, Engl 113</td>
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<td>CE 173, Humanities</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
<td><strong>17</strong></td>
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Irrigation and Drainage Engineering

The scope of Irrigation Engineering extends from an understanding of the basic soil-plant-water relationships to the design and construction of control, conveyance, and distribution works with proper appreciation for the economic, administrative, and social problems involved in irrigation development. Present-day irrigation projects often require high dams, long tunnels, canals and pipelines, and pumping plants. Irrigation projects must be planned to serve other purposes as well. Overall water economy demands that the irrigation engineer give careful attention to efficiencies of conveyance, application, and consumption of available water supplies. Training in the science and art of Irrigation at Utah State University provides the breadth and depth necessary for proficiency in any or all of these aspects of Irrigation Engineering.

Close interdepartmental association with Agronomy, Civil Engineering, Soil Physics, and Botany is achieved to strengthen the program of those wishing special emphasis in these aspects of the science.

Graduate Study

The MS and Doctor of Philosophy degrees are offered in Agricultural Engineering (Irrigation and Drainage and Water Resources fields), the Professional Engineering degree is offered in Irrigation and Drainage Engineering, and in collaboration with related depart-
ments the Doctor’s degree is offered in Irrigation Science.

Curricula and research leading to an advanced degree either on the Master’s degree or Doctor’s degree level are supervised by a Graduate Committee appointed by the Dean of the School of Graduate Studies. Staff members of the major department and of closely related departments serve on these committees. All study and research programs must be approved by such a committee before admittance to candidacy for an advanced degree. The study and research program for a particular degree must also satisfy all of the requirements listed in this catalog under the School of Graduate Studies.

A diagnostic examination covering the undergraduate engineering subject matter will be given to all entering graduate students. The exam includes mathematics, mechanics and strength of materials, fluid mechanics, soil mechanics, and structures.

A graduate major leading to the MS and PhD degrees is available in Hydrology and Water Resources. For more information concerning this major, see the material found in the section of this catalog for the Department of Civil Engineering.

Agricultural and Irrigation Engineering Courses

10. Irrigation Practice. Primarily for agricultural students. Principles and practices of efficient use of water, water measurement, farm surveying. Three lectures, one lab. (4Sp) Daines


110. Irrigation Principles. Primarily for upper division students in agriculture and colleges other than Engineering. Water measurement, conveyance and application, consumptive use of water and water requirements, pumping, drainage, and soil-water relationships. Prerequisite: Math 34. Two lectures, one lab. (3F) Keller

143. Irrigation Principles. For advanced engineering students. Soil, water, plant relationships; water requirements; efficiency of water use; flow of water in soil. Prerequisite: CE 142. Two lectures, one lab. (3F) Keller

145. Surface and Subsurface Drainage. The application of engineering principles to the design of surface and subsurface drainage facilities including open and covered drains, and drainage by pumping from wells. Soil properties, land reclamation, salinity problems and drain construction. Prerequisite: CE 142. Three lectures, one lab. (4Sp) Bishop

146. Water Conveyance and Control. Fluid and soil mechanics are applied to problems of water conveyance and control, including canals, flumes, transitions, pipe lines, diversions, drops and chutes, spillways, checks and headgates. Prerequisites: CE 142, 150; concurrently CE 106. Three lectures, one lab. (4Sp) 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 AE 143. (3W) Keller

148. Design of Farm Irrigation Systems. Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems for application of water by surface and sprinkling methods. Prerequisites: 143 and CE 142. (3S) Bishop

149. Water Law and Institutions. Laws governing the acquisition, adjudication and administration of water rights, state water codes, interstate compacts, international agreements, federal water laws and legislation, irrigation institutions, conservancy districts, water pollution control districts, state and local organizations. Three lectures. (3W) Milligan

160. Water Management. Organisation and administration of conservancy districts, metropolitan districts and other water distribution institutions. Distribution of water, financing for construction and operation, maintenance of canals, flumes, pipe lines, dams, regulating reservoirs, and other water facilities. Three lectures. (3W) Bishop, Milligan

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in Agricultural Engineering. Students are expected to develop initiative in pursuing these
Civil Engineering 149

Civil Engineering consists of the economic application of the laws, forces, and materials of nature to the design, construction and operation of engineering works including bridges, buildings, highways, dams, water supply and sewerage systems.

The Department of Civil Engineering offers work leading to the Bachelor of Science, Master of Science, and Doctor of Philosophy degrees.

The curriculum is accredited by the Engineering Council for Professional Development.

The four-year program listed here leads to the Bachelor of Science degree in Civil Engineering. A five-year program is available for students with inadequate background or those desiring to take Military Science, competitive athletics or part time employment.

Freshman and Sophomore Years Common to All Engineers
(see College of Engineering Introduction)

JUNIOR YEAR

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<td>CE 84, EE 124, CE 181</td>
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SENIOR YEAR

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<td>CE 128, 121, 190</td>
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</tbody>
</table>

Department of

Civil Engineering

Acting Head: Professor Irving S. Dunn
Office in Engineering L-162

Professors A. Alvin Bishop, Jerald E. Christiansen, Calvin G. Clyde, Gordon H. Flammer, Vaughn E. Hansen, Orson W. Israelson, Emeritus, Cleve H. Milligan, Dean F. Peterson, Dean of College of Engineering;
Associate Professors J. M. Bagley, William A. Cordon, Spencer H. Daines, Fred W. Kiefer,1 Charles N. Merkley, Elliot Rich1; Assistant Professors Chen-lung Chen, Vance T. Christiansen, Norman B. Jones, Jack Keller, Cary K. K. Mak, Willis A. Tingeey, Gary Z. Watters; Research Assistant Frank W. Haws; Research Engineers Earl Israelson, Gaylord V. Skogerboe, Derle Thorpe.

Civil Engineering
Water Engineering

Never in the history of our country has there been more concern with water. Continuing and conflicting demands for water require that the engineer today be trained to handle highly complicated water situations.

USU has a long tradition of training and research in the varied and extensive aspects of water resource development and use. It has developed a well-balanced program, expanded and oriented to provide the training needed to cope with impending water problems of this country and of the world. Teaching and research staff and facilities are continually expanding. A new Engineering Building with modern and well-equipped laboratories was completed in 1960. A new 80,000 square foot Utah Water Research Laboratory was completed in 1965.

The broad scope of Water Resources Engineering is amply provided in a rich offering of "water" courses in the College of Engineering. Through interdisciplinary collaboration many excellent course offerings are available in other colleges. A long and continuing tradition of international collaboration in water resource work gives breadth and flavor to the overall program.

Hydrology and Water Resources Engineering

Hydrology is a fundamental discipline which provides the underpinning for the orderly and unified solution of most water problems. This hydrologic foundation must be translated into policies, plans, and procedures for optimum development and utilization of the available water supply. Hydrologic considerations must be blended with a substantial body of other engineering, economic, legal, and social information in the formulation of comprehensive multiple-purpose plans. The problems encountered by the water resource engineer require ingenuity, imagination and skill in engineering applications.

Considerable flexibility in the arrangement of degree programs is permitted in this field. Those with particular interest in scientific or applied hydrology or in water resources administration, planning, and management may supplement the strong core of offerings in the Civil Engineering and Agricultural and Irrigation Engineering Departments by choosing from more than...

Soil Mechanics Structures and Materials Engineering

Although Water Engineering is emphasized at Utah State, an outstanding staff enhances the offerings in structures, soil mechanics, highways, and materials of engineering. Productive research by staff and graduate students, particularly in materials of engineering, receive frequent recognition in international technical publications.

Graduate Study

This Department offers the Master of Science degree in most Civil Engineering fields and the Doctor of Philosophy degree in Fluid Mechanics, Soil Mechanics, Water Resources, Hydrology, and Hydraulics. Curricula and research leading to an advanced degree either on the Master's degree or Doctor's degree level are supervised by a Graduate Committee appointed by the Dean of the School of Graduate Studies. Staff members of the major department and of closely related departments serve on these committees. All study and research programs must be approved by such a committee before admittance to candidacy for the advanced degree. The study and research program for a particular degree must also satisfy all of the requirements listed in this catalog under the School of Graduate Studies.

A diagnostic examination covering the undergraduate engineering subject matter will be given to all entering graduate students. The exam includes mathematics, mechanics and strength of materials, fluid mechanics, soil mechanics, and structures. Depending on the candidates chosen field of study, three or four parts will be taken.

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.

Civil Engineering Courses

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


84. Elements of Surveying. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math 36, 46. Two lectures, two labs. (4F) Daines

85. Advanced Surveying. Problems in leveling, curves, spirals, stadia, plane table, and city surveying. Prerequisite: CE 84. One lecture and two labs. (3Sp) Daines


103. Strength of Materials. Stress and strain, centric, torsional and flexural loading deflections, combined loading, columns, repeated and dynamic loadings, connections. Prerequisites: CE 91. Four lectures and one lab. (5F, W, Sp) Staff

105. Elementary Structural Analysis. Analysis of stresses and deflections in statically indeterminate structures. Prerequisite: CE 103 or equivalent. Three lectures and one lab. (4W) Staff

106. Elements of Structures. Principles and practices of reinforced concrete analysis and
design. Prerequisite: CE 105 or equivalent. Three lectures and one lab. (4Sp) Staff

107. Elements of Structures. Principles and practices of analysis and design of steel structures. Prerequisite: CE 107 or equivalent. Three lectures and one lab. (4Sp) Staff

108. Structural Theory and Design. Design of Steel and Reinforced Concrete Structures. Prerequisite: CE 107 or equivalent. Three lectures and one lab. (4W) Staff

120. Highway Engineering. Highway systems, planning, economy, finance, location, plans, rights of way, geometric design and roadside development. Prerequisite: CE 84 or 81, Senior standing or Instructor's consent. Three lectures. (3F)


122. Traffic Engineering and Urban Planning. Street and highway traffic problems; principles of design and planning of thoroughfares based on operational characteristics; traffic control and regulation. Prerequisite: CE 120. Three lectures. (3Sp) Staff

127. City Planning. Master plans, civic units, parks and playgrounds, utilities, housing, subdivisions, zoning, civic centers and airports. Prerequisite: CE 120. Two lectures, one lab. (3Sp) Staff

128. Engineering Materials. The nature and properties of non-metallic and metallic engineering materials, includes testing materials in accordance with ASTM standards. Two lectures, one lab. (3F) 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: CE 128 or equivalent. Two lectures, one lab. (3W) Cordon

130. Construction Cost Estimating. Application of construction equipment and methods of preparing cost estimates, including an introduction to the Critical Path Method of Planning and scheduling construction projects. Prerequisite: Instructor's consent. (3Sp) Jones

131. Indeterminate Structures Deflections of Structural Elements. Analysis and design of statically indeterminate beams, trusses, and frames. Prerequisite: CE 105. Three lectures, one lab. (4F) Dunn


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 turbines and pumps. Prerequisites: Math 110 concurrently CE 92. Fall, three lectures, Winter and Spring, two lectures and one lab. (3F, 3W, 3Sp) Clyde, Flammer, Watters

142. Fluid Mechanics and Hydraulics. Preparatory course for graduate students majoring in fluid mechanics or irrigation who show inadequate preparation in this area. Subject matter of CE 140, 141, 142 will be covered. This course not accepted as graduate credit in fluid mechanics or irrigation engineering major. Four lectures. (4F) Watters

144. Applied Hydraulics and Pneumatics. Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite: CE 140. Two lectures, one lab. (5W) Keller

150. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and the design of earth structures and foundations. Prerequisites: CE 105, 141. Three lectures, one lab. (3F) Dunn, Kiefer

151. Soils Engineering. The application of engineering soil mechanics and of structural theory to design of foundations, dams, highways, and other engineering problems. Prerequisite: CE 150 or equivalent. Three lectures, one lab. (3W) Dunn, Kiefer

152. Foundation Analysis and Design. A study of the engineering properties of soils and their effect on the design of footings, pile foundations, cofferdams, caissons, mat foundations and retaining walls. (3Sp) Dunn

173. Hydrology and Meteorology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, ground water, and runoff; methods of collection of hydrologic data and their use in water supply and flood control studies. Prerequisite: CE 141, or instructor's consent. Three lectures, one lab. (4W) Staff

181. Photogrammetry. The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaic and restituted photographs, their construction and uses. Prerequisites: ME 22, CE 81 or 84, or senior standing in Forestry, Range or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3Sp) Tingey

182. Route Surveying. Theory and practice in highway curves and earth work, including methods used in highway, street, canal, pipeline and general project surveys. One lecture, one lab. (2Sp) Tingey

190. Engineering Economy. Applications of the mathematics of finance and computing tech-
193. Municipal Water Treatment and Waste Water Disposal. Introduction to the theory and design of municipal water and waste water treatment processes, based upon physical, chemical and biological principles. Prerequisite: CE 142. Three lectures, one lab. (4F) Jones


197. Honors Studies. Advanced work for qualified students. Work is initiated by a student and may consist of a special individual project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: A satisfactory grade point average, recommendation of instructor and approval of the College of Engineering Honors Committee. 1-3 credits, arranged. (F, W, Sp) Staff

201, 202, 203. Advanced Structural Theory and Design. Advanced topics in structural theory including analysis of indeterminate frameworks, model analysis, individual problems in the design of modern structures. Prerequisite: CE 152. Three lectures. (3F, 3W, 3Sp) Dunn, Milligan

210. Earth and Rock-Fill Dams. Design of flexible type (earth or rock-fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Attention is given to foundations and construction details. Prerequisite: CE 150. (5W) Clyde, Milligan

211. Masonry Dams. Design of rigid type dams. Stress, analysis and design of gravity, multiple arch, and deck types of masonry dams, timber, steel, and miscellaneous types. Prerequisite: CE 108. (3F) Clyde

212. Appurtenances to Dams and Operation of Reservoirs. Hydraulics and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. Prerequisite: CE 142. (3Sp) Staff

215. Hydraulic Machinery. Analysis of impulse and reaction turbines, centrifugal and axial flow pumps; typical installations in hydroelectric and pumping plants. Prerequisite: CE 142. (5W) Watters

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: CE 152. (3F, W, Sp) Cordon

228. Advanced Concrete Engineering. Basic properties of concrete and concrete materials including the study of admixtures and pozzolans. Significance of tests and analysis of acceptance tests, performance tests, and control tests. Concrete as a construction material. Prerequisite: CE 128 or equivalent. (5W) Cordon

229. Special Problems in Civil 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, Sp) Staff

240. Advanced Fluid Mechanics Lab and Instrumentation. Experimental investigation of fluid flow phenomena. Design and development of modern laboratory equipment and instrumentation. Prerequisite: CE 142 or 143. (2 to 4F) Clyde


242. Open Channel Flow. Basic theory of uniform and varied flow in open channels and its application to the design of open channels and open channel control structures for both subcritical and supercritical flow. Prerequisite: CE 241. Three lectures, 1 lab. (4Sp) Flammer

243. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures. Prerequisites: CE 142, AE 146. (3Sp) Staff

246. Porous Media Flow. Darcy's law and the velocity potential, stream function, flow nets, Dupuit flow, complex theory applied to seepage flow, approximate methods, analogs, seepage from canals, unsteady flow. Prerequisites: CE 141 or 143, Math 141. (5Sp) Watters

250. Advanced Soil Mechanics. Theories of seepage, capillarity, stress, consolidation, and stability are developed and applied to the practical design and construction of earth structures. Interpretation of laboratory tests is given special attention. Prerequisite: CE 150 or its equivalent. (3Sp) Dunn, Peterson
251. Advanced Soil Mechanics Laboratory. Advanced laboratory work in soil mechanics to be arranged with instructor. Prerequisites: CE 150 and 250 (may be taken concurrently). (1Sp) Dunn, Kiefer

255. Sediment Transport and Alluvial Channel Flow. Sedimentation problems, sediment transport, channel roughness and design of stable channels. Three lectures, 1 lab. (3F) Bishop

260. Dimensional Analysis and Similitude. The application of dimensional analysis and similitude to the solution of a variety of problems in engineering in the fields of fluid mechanics, structural analysis, vibration problems, electrical and other physical phenomena. Applications include design of experiments, interpretation of experimental data, development of equations, theory of models, and use of analogies. Prerequisite: Approval of instructor. (4F) Watkins, Flammer

262. Water Resources Engineering Systems. Relationship of development of water resources to development of other natural resources. Historical and present concepts in water development. Systems approach to development of water resources. Prerequisite: Consent of instructor. (3F) Milligan, Bagley

263. Water Resources Engineering Institutions. Current problems and policies with regard to water resource allocation and administration. Institutional factors, interstate and international compacts and commissions, federal valley authorities, coordinating mechanisms, state and federal role in water resource development. Prerequisite: Consent of instructor. (5W) Milligan, Bagley

264. Water Resources Engineering Planning. General principles and procedures of water resource planning within a regional, multipurpose context, considerations of project formulation, alternative plans, economic and financial analysis. Prerequisite: Consent of instructor. (8Sp) Milligan, Bagley

265. Directed Reading and Special Studies in Civil Engineering. Investigations into topics of special interest in fluid mechanics, hydrology, water resources, irrigation, structures, highways, soil mechanics or other Civil Engineering specialty. Appropriate direction by staff. Discussion periods are arranged. A final report or examination is required. Prerequisite: Consent of the instructor. Credit arranged. (F, W, Sp) Staff

266. Hydrologic Methods. Application of mathematical, statistical and graphical techniques to the analysis of hydrologic and climatologic elements. Frequency analysis, spacial comparisons and correlations, extending records, harmonic analysis, curve fitting and smoothing computational aids (including multiple-graphi-
Department of Electrical Engineering

Head: Professor Larry S. Cole
Office in Engineering L-150

Professors Doran J. Baker, Clayton Clark, Bertis L. Embry, Bruce O. Watkins; Associate Professor William L. Jones; Assistant Professors Duane G. Chadwick, Irvin D. Dunmire, W. Arnold Finchum, Ronney D. Harris, Robert L. Heyborne, Craig K. Rushforth; Instructor Lynn Kirklin; Research Engineers Wayne K. Barlow, Fon R. Brown, Ernest R. Huppi, Scott P. Stewart, Duard S. Woffinden, Clair L. Wyatt; Research Physicists Ralph Briscoe, Thomas P. Condron, John C. Johnson.

The Department of Electrical Engineering offers undergraduate and graduate training leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees.

The curriculum is accredited by the Engineers' Council for Professional Development.

The four-year program listed here leads to the Bachelor of Science degree in Electrical Engineering. A five-year program is also available for students planning to participate in the advanced military program, in athletics, or in part time employment.

The curriculum provides a balanced program in the fundamental sciences and mathematics, engineering sciences, engineering design, humanities and communication skills. Laboratory work in small groups is an integrated part of most courses to provide physical confirmation of basic principles and experience with instruments, components and engineering techniques.

Satisfactory completion of the BS program qualifies the student for entrance into the electrical engineering field with professional status.

Electrical Engineering Curriculum

Freshman and Sophomore common engineering curriculum listed in the College of Engineering introduction.

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<td><strong>Total</strong></td>
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Graduate Study

The basic graduate program in Electrical Engineering includes circuits, waves, and fields, with supporting mathematics and physics.

<sup>1</sup>Required for EE majors: optional for others.

<sup>2</sup>See College of Engineering section for humanities requirements.
Specialization is available in the fields of Antennas and Propagation, Servo-Mechanisms, Microwave Measurements, Transistor Circuitry and Semiconductor Physics, Communication Theory and Radiometry.

A typical 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. For further details on graduate study, refer to the USU Graduate Catalog.

### Electrical Engineering Courses

#### 71. Electric Circuits. DC and Steady state AC circuit analysis. Ohm's law, Kirchhoff's laws and network theorems. Power in DC and AC circuits. LRC circuits and resonance. Fourier and graphical analysis of periodic functions. Prerequisite: Physics 21 or equivalent. Four lectures, one lab. (6F, W, Sp, Su) *Duhamire*

#### 105. Circuits and Machines. Generation, transmission and utilization of electric power. Single and 3-phase power circuits. Magnetic circuits, transformers and protective equipment. Introduction to DC and AC machines. Prerequisite: EE 71 or equivalent. Two lectures, one lab. (3F) *Emby*

#### 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 71, 106. Three lectures, one lab. (4F) *Emby*

#### 108. Electrical Machinery II. A continuation of EE 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) *Emby*

#### 110. Transmission Lines. Basic transmission line theory. High frequency lines, matching stubs and sections. Wave guides and special lines. Prerequisites: EE 111, 139. Three lectures, one lab. (4W) *Harris*

#### 111. Network Analysis I. Basic network conventions and topology; formulation of network equations; solutions via differential equation, LaPlace transform and operational methods. Prerequisite: E E 71 and Math 110. Three lectures. (3W) *Cole*

#### 112. Network Analysis II. A continuation of EE 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. (3Sp) *Cole*

#### 120. Antennas. Fundamentals of antennas, radiation and wave propagation; directional arrays; feed lines and matching phasing networks; antenna and field strength measurements. Prerequisites: E E 110, 139. Three lectures, one lab. (4Sp) *Clark*

#### 123. Electronics Laboratory. A laboratory course to accompany EE 124. Required of all EE majors; optional for others. Prerequisites: Concurrent enrollment in E E 124. (1F, W) *Chadwick*


#### 125. Electronic Circuits. Principles, analysis and design of tube and transistor voltage amplifiers; feedback principles and feedback amplifiers. Prerequisite: E E 124. Three lectures, one lab. (4Sp) *Finchum*

#### 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 aoustics and electro-mechanical systems. Prerequisites: E E 111, 125. Three lectures, one lab. (4F) *Cole*

#### 139. Fundamentals of Electromagnetic Waves. Introduction to static electric and magnetic fields; Maxwell's equations; wave equation with emphasis on the plane wave solution. Applications to high frequency lines and waveguides. Prerequisites: Math 110 and E E 71. Three lectures. (3F) *Emby*

#### 141. Microwaves. Microwave generators and microwave measurements; cavity resonators; radiators; applications of ferrite and semiconductor materials to microwave systems for
151. EE 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, 2Sp) 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. Prerequisite: Math 110. Two lectures, one lab. (3F, W) Finchum

175, 176, 177. Electrical Engineering Seminar. A weekly meeting of staff and senior EE majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents technical papers on suitable topics. (1F, 1W, 1Sp) Staff

178. Switching Circuits. Number systems (decimal, binary, octal, etc.): Boolean algebra (postulates, theorems, applications to switching design, etc.): Logic circuit blocks (AND, OR, NAND, NOR, etc.): Logic design of switching networks; simplification methods (tabular, map, etc.). Prerequisites: Upper division standing. Three lectures. (3F, W) Finchum


185. Introduction to Semiconductor Device Theory. Basic principles of semiconductor theory; semiconducting materials; p-n junction theory, survey of new devices. Prerequisite: Modern Physics. (5F, Sp) Jones

197. Honors Studies. Advanced work for qualified students. Work is initiated by a student and may consist of a special, individual project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: A satisfactory grade point average, recommendation of the instructor and approval of the College of Engineering Honors Committee. This course may be repeated. 1-3 credits, arranged. (F, W, Sp)

200. Special Studies in Electrical Engineering. Preparation of professional papers and reports, research, and special problems. Credit arranged. (F W, Sp) Staff

211. Amplifier Circuit Theory. Gain and stability analysis of tuned transistor amplifiers; design of filter amplifiers using feedback techniques; low noise amplification. Prerequisite: EE 180. (4W) Jones

212. High-speed Switching Devices and Circuits. Semiconductor device transient analysis, the relationship of circuit switching properties to device physics. Prerequisites: EE 185, EE 245. (4Su) Jones


231, 232, 233. Electromagnetic Fields and Waves. Advanced static and dynamic electric, current, and magnetic field theory; Maxwell's equations; wave equations; solution of electromagnetic field and wave problems in coordinates appropriate to various wave structures; non-classical electrodynamics. Prerequisite: EE 139 or Physics 175. Three lectures. (3F, 3W, 3Sp) Baker

235. Radio Propagation. Radio wave transmission through dielectric and ionized media. 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: EE 139 or equivalent. (3Su) Clark
158 College of Engineering

236. Advanced EM Propagation. Electromagnetic wave propagation in a space containing free electrons and a constant magnetic field. Three lectures. (3F, W) Clark, Harris


238. Selected Reading in Radio Science. Lecture arranged. (2 arr) Clark

239. Selected Reading in Radio Science. Lecture arranged. (2 arr) Clark

240. Microwave Measurements. Theory and practice in measurement of impedance, power, frequency and wave length at frequencies above 500 mc. Oscillators and detectors will be studied along with the characteristics of certain types of transmission lines and associated equipment in the microwave region. Prerequisites: EE 139, 141 or equivalent. One lecture, one lab. (2Su) Clark

245. Transistors and Integrated Circuits. Transistor theory, transistor characteristics, and fabrication techniques used in integrated circuits. (3Sp) Brown


261. Space Science and Engineering. A survey course covering aero-space environment; vehicles and propulsion systems; trajectories, control, and guidance; instrumentation and communication systems; power sources; detection and tracking; weapons; satellites; space exploration. Prerequisites: Physics 22, Math 99. (2W) Rushforth

265. Particle Interactions. Collision phenomena in ionized gases; elastic scattering in central force field; scattering cross sections; ionization, excitation, and charge transfer by electron and ion impact; photoabsorption; negative ions; mobility and diffusion of electrons and ions; electronic energy distributions and drift velocities; recombination; surface phenomena; plasmas. Three lectures. (3F) Brown

275, 276, 277. Graduate EE Seminar. A weekly meeting of staff and graduate EE students. Each student prepares and presents technical papers on suitable topics. One lecture. (1F, 1W, 1Sp) Staff

278. Seminar in Radio Science. One lecture (1 arr). Clark

281. Radiometry. Principles of thermal emission, transmission and detection of radiant energy; detection and measurement systems. Prerequisites: Physics 22, Math 99, and EE 126. Three lectures. (3Sp) Wyatt


291, 292. Statistical Communication Theory. Statistical nature of the communication process. Random processes, time and statistical averages, Fourier analysis, spectral theory, sampling. The effects of linear and non-linear data processing on the statistical properties of signals. Wiener filters, matched filters, applied statistical decision theory. Introduction to classical information theory—quantitative definition of information, coding, Shannon's theorem. Prerequisites: Math. 40 or equivalent. Three lectures. (3W, 3Sp) Staff

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

Department of

Industrial and Technical Education
(Industrial Teacher Education, Industrial Technology, Technical Education)

Head: Professor Carl R. Bartel
Office in Mechanical Arts 102


The Department of Industrial and Technical Education offers undergraduate training and education leading to the Bachelor of Science degree in Industrial Teacher Education and Industrial Technology. The Department also offers a two-year program leading to a Certificate of Completion in Technical Education.

Facilities of the Department include buildings designed and built to fit the specific needs of curriculums taught. The laboratories contain modern and up-to-date equipment for instructional use.

A graduate program is offered by the Department for industrial educators who plan to take advanced work beyond the Bachelor's Degree. The graduate program includes two types of Masters Degrees, which are Master of Science in Industrial Education and the Master of Industrial Education. The Doctor of Education Degree in Industrial Education is offered jointly with the College of Education.

Industrial Teacher Education Curriculum

Industrial Arts Teacher Education. A Bachelor's degree in Industrial Teacher Education with a major in Industrial Arts Teacher Education prepares one to teach in junior and senior high school positions. The curriculum is designed to meet State Certification requirements for the General Secondary and Industrial Arts Certificates. Courses emphasize laboratory skills and technical knowledges included in basic American industries. The curriculum also includes courses in the arts, sciences, education, and professional Industrial Education.
The Industrial Teacher Education curriculum with a major in Industrial Arts Teacher Education is as follows:

### Industrial Arts Education Major

**FRESHMAN YEAR**

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**SOPHOMORE YEAR**

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<tr>
<td>Ind Crafts</td>
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**Total** 16 19 17

**JUNIOR YEAR**

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<th>Course</th>
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<td>PH 155</td>
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<td>Ed 126, 150</td>
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<td>Adv Technical Sequence</td>
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<td>ITE 139</td>
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**Total** 16 17 16

**SENIOR YEAR**

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<th>Course</th>
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<tbody>
<tr>
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<td>ITE 102, 193</td>
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<tr>
<td>ITE 194</td>
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<td>ITE 195</td>
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<tr>
<td>Adv Technical Sequence</td>
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<tr>
<td>Elective (Minor)</td>
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**Total** 18 16 15

Trade and Industrial Teacher Education. A Bachelor's Degree in Industrial Teacher Education with a major in Trade and Industrial Teacher Education prepares one to teach in high school and post high school Trade and Industrial programs. A candidate for the degree must show evidence of successful occupational experience in the specific area in which he is preparing to teach. As part of the degree requirement, a student must meet the occupational experience requirement as stated in the State Plan of the State Board for Vocational Education. The curriculum is designed to meet State Certification requirements for the General Secondary and Unit Shop Certificates. The Industrial Teacher Education Curriculum with a major in Trade and Industrial Teacher Education is as follows:

### Trade and Industrial Education Major

**FRESHMAN YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
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<tbody>
<tr>
<td>Trade Courses</td>
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<tr>
<td>English 1, 2, 3</td>
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<td>Math 35, 44</td>
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<td>ITE 80, 81, 82</td>
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<td>Speech 21</td>
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<tr>
<td>Humanities</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ITE 1</td>
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<td></td>
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</tr>
<tr>
<td>PE</td>
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**Total** 17 18 16

**SOPHOMORE YEAR**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Trade Courses</td>
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<tr>
<td>Physics 17, 18, 19</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Biological Science</td>
<td></td>
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<tr>
<td>Soc &amp; Beh Sci Group (Econ 51) (Psy 53)</td>
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<tr>
<td>Approved Electives</td>
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**Total** 16 16 18

**JUNIOR YEAR**

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<th>Course</th>
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<tr>
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<tr>
<td>Hum/Soc Sci Group</td>
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<tr>
<td>Psych 100, 102</td>
<td>3</td>
<td>3</td>
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<td>Pub Health, 155</td>
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<td>Ed 126, 150</td>
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<tr>
<td>English 111</td>
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<tr>
<td>Approved Electives</td>
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**Total** 18 15 16

**SENIOR YEAR**

<table>
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<th>Course</th>
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<tr>
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<tr>
<td>ITE 104, 101, 196</td>
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<td>3</td>
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<tr>
<td>ITE 102, 193</td>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>ITE 194</td>
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<tr>
<td>ITE 195</td>
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</tr>
<tr>
<td>Approved Electives</td>
<td>6</td>
<td>3</td>
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</tbody>
</table>

**Total** 18 16 16
**Technical Teacher Education.**

A Bachelor's degree in Industrial Teacher Education with a major in Technical Teacher Education prepares one to teach in post high school technical programs. A candidate for the degree must show evidence of successful occupational experience in the specific technical area in which he is preparing to teach. As part of the degree requirement, a student must meet the occupational experience requirement as stated in the State Plan of the State Board for Vocational Education. The Industrial Teacher Education Curriculum with a major in Technical Teacher Education is as follows:

**Technical Education Major**

<table>
<thead>
<tr>
<th>Course</th>
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<th>W</th>
<th>Sp</th>
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<tr>
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<tr>
<td>English 1, 2, 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Math 35, 46</td>
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<td>5</td>
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<tr>
<td>ITE 80, 81, 82</td>
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<tr>
<td>Humanities Group</td>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>ITE 1</td>
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<td></td>
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</tr>
<tr>
<td>PE</td>
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**SOPHOMORE YEAR**

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<tr>
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<tr>
<td>Physics 17, 18, 19</td>
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<td>5</td>
</tr>
<tr>
<td>Biological Science</td>
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<tr>
<td>Math 97, 98</td>
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<tr>
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**JUNIOR YEAR**

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<tr>
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<td>Sph 105, Hum/Soc Sci Group</td>
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<td>English 111</td>
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<td>Approved Electives</td>
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**SENIOR YEAR**

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<td>ITE 102, 101, 196</td>
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<td>ITE 104, 193</td>
<td>3</td>
<td>3</td>
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<td>ITE 194</td>
<td>9</td>
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<tr>
<td><strong>ITE 195</strong></td>
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<td>Approved Electives</td>
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<td>6</td>
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<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>16</td>
<td>18</td>
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</table>

**Four-Year Industrial Technology**

Programs in Industrial Technology provide university training for high level industrial technicians for technical, supervisory, and managerial positions in industry. Excellent foundation is provided for entrance into Civil Service positions and for private business and industry.

The completion of the Four-Year Industrial Technology curriculum leads to a Bachelor’s degree in Industrial Technology with majors in Aeronautics, Automotive and Diesel, or Welding.

**Four-Year Industrial Technology Curriculum**

**Aeronautics Technology.** A Bachelor’s degree in Industrial Technology with a major in Aeronautics prepares one to enter the Aerospace industry as a high level technician and to assume responsible supervisory and administrative positions in maintenance management, transportation research, and design; and the missile industry. The Aeronautics Technology curriculum is fully certified with Air Agency, complying with Federal Aviation Agency regulations.

Students desiring to enter industry in technical maintenance fields should successfully accomplish the written and practical FAA examinations of the Air Frame and Power Plant rating. The Four-year Industrial Technology curriculum with a major in Aeronautics is as follows:

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>ITE 5, 6, 7</td>
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</table>
ITE 6a, 6a, 7a ........................................ 3 3 8
Math 34, 35, 46 .................................. 3 5 5
English 1, 2, 3 .................................. 3 3 3
Econ 51, Mfg E 66 ................................ 5 3 3
ITE 1, 18 ......................................... 1 3
AS, MS, or PE .................................. 1 1 1

Total .................................................................. 19 18 18

SOPHOMORE YEAR

Course      F W Sp
ITE 8, 9, 10 .................................. 4 4 4
ITE 8a, 9a, 10a ................................ 4 4 4
ITE 80, 81, 82 ................................ 3 3 3
Physics 17, 18, 19 ................................ 5 5 5
ITE 71 ........................................... 3
GE 2 ........................................... 1

Total .................................................................. 17 19 16

JUNIOR YEAR

Course      F W Sp
ITE 106, 108, 114 ................................ 3 3 4
ITE 117, 118, 119 ................................ 3 3 3
English 113 ....................................... 3
Chemistry 10, 11 .................................. 5 5
Economics 170 ..................................... 5
Humanities elective ................................ 7
Approved electives ................................ 8

Total .................................................................. 18 16 18

SENIOR YEAR

Course      F W Sp
ITE 197, 105, 111 ................................ 4 2 3
ITE 185, 112, 113 ................................ 4 2 3
ITE 109, 110, 192 ................................ 3 3 3
Mfg E 150, 180, 148 ................................ 4 3 3
Speech 105 ........................................ 3
Pol Science 101, 102 .............................. 3 3
Biological Elective ................................. 5

Total .................................................................. 18 16 17

Automotive and Diesel Major

FRESHMAN YEAR

Course      F W Sp
English 1, 2, 3 .................................. 3 3 3
Math 35, 44 ....................................... 5 3
ITE 27, 28, 29 .................................... 4 4 4
ITE 50, 81, 82 .................................... 3 3 3
ITE 47, 48, 71 .................................... 3 3 3
ITE 22, 37 ........................................ 3
MS, AS, or PE .................................. 1 1 1

Total .................................................................. 19 18 17

SOPHOMORE YEAR

Course      F W Sp
ITE 22, 37 ........................................ 4 3
Chem 10, 11 ....................................... 5 5
Biology 1 ......................................... 5
Sociology 70, Econ 51 ............................ 5 5
Humanities ........................................ 3 3
ITE 22, 37 ........................................ 3 3
GE 2 ........................................... 1

Total .................................................................. 18 19 18

JUNIOR YEAR

Course      F W Sp
ITE 125, 126, 127 ................................ 3 3 3
Physics 17, 18, 19 ............................... 5 5 5
ITE 191, 192, 136 ................................ 3 3 3
ITE 124, 121 .................................... 3 3 3
Humanities Group ................................ 3
Approved Electives .............................. 1
Mfg E 56 ........................................... 3
BA 100 ........................................... 4

Total .................................................................. 18 16 18

SENIOR YEAR

Course      F W Sp
ITE 121, 122, 123 ................................ 3 3 3
English 113 ....................................... 3
BA 147, Speech 105 .............................. 4 3
Mfg E 150, 148 .................................... 4 3
ITE 128, 132 .................................... 3 3
Econ 125 ........................................... 3
Approved UD Electives ......................... 2 5 3

Total .................................................................. 15 15 15

Welding Technology. A Bachelor’s degree in Industrial Technology with a major in Welding prepares one to enter industry in which highly technical welding skills and knowledge are required.

A successful graduate of this program will be a well qualified high-level technician in all phases of Welding Technology. The Four-year Industrial Technology curriculum with a major in Welding is as follows:
Students interested in this program should contact the Industrial and Technical Education Department Head.

Minors Administered by the Department

**Driver Education.** The Driver Education minor is administered and approved by the Industrial and Technical Education Department. The minor is designed to meet State Driver Education Certification requirements.

A minimum of twelve quarter hours are required in the area of Driver and Safety Education. Also a minimum of six quarter hours are required in related safety work. An approved minor consists of twenty-four quarter hours. Check with Department advisers for approved courses.

**Industrial Arts Education.** The Industrial Arts Education minor may be taken only by persons who have majors outside of the Department of Industrial and Technical Education and are planning to teach in small schools in Industrial Arts programs for less than half of a teaching load.

A Department approved minor consists of a minimum of twenty-seven quarter hours. Check with the Department advisers for approved courses.

**Graduate Study**

Two types of Master's degree programs are available to students doing graduate work in the Department of Industrial and Technical Education. These programs are the Master of Science Degree in Industrial Education and the Master of Industrial Education Degree.

The Doctor of Education degree in Industrial Education is available to those students who desire to do
advanced work beyond the Master's Degree. This degree program is designed for professional instructors in the field of Industrial Arts, Technical, and Trade and Industrial Education. The Doctor of Education degree in Industrial Education is an interdisciplinary degree program administered jointly by the College of Education and the College of Engineering.

The degree programs are sufficiently flexible to meet the needs of individuals engaged in the various phases of Industrial Education work. Candidates are given assistance in planning a program which will provide them with technical and professional development considered essential. For information on the programs for these degrees, see the Graduate School Catalog.

Industrial and Technical Education Courses

General Courses

1. Orientation. Formerly IE 1. The study of the various occupational opportunities in Industrial and Technical Education, including the necessary preparation for entrance into these occupations. (1F, W) Staff

2. Applied Shop Mathematics. Formerly IE 6. Simple mathematical formulas are used in solving problems in mechanical work. These include speed ratios, steel square, micrometer reading, and area and volume problems. (3F, Sp) Mortimer


90. Industrial Crafts-Leather. Formerly IE 140. 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. (3F, Su) Wallis

91. Industrial Crafts-Metal. Formerly IE 141. Principles and practices of industrial crafts that pertain to the metal area. Design and production of functional metal objects as well as fundamentals of lapidary processes will be stressed. (3W, Su) Halles

92. Industrial Crafts-Plastics. Formerly IE 142. 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. (8Sp, Su) Halles

Aeronautics Courses

5, 5a. Composite Aircraft Structure. Formerly Aero 5, 5a. Theory of flight, design, construction, repair, and maintenance of aircraft structures. Textile skins, protective finishes, primary aircraft wood structures in accordance with Air Federal Regulations. (3 and 3F) Merrill

6, 6a. All-metal Aircraft Structures. Formerly Aero 6, 6a. Design, construction, repair, and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, alignment and jigging, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Federal Air Regulations. (3 and 3W) Merrill

7, 7a. Aircraft Maintenance. Formerly Aero 7, 7a. The maintenance, repair, and alteration of modern aircraft including primary and secondary structures, and the various systems and appliances. Rigging, assembly, and general servicing is included. Pertinent Federal Aviation Regulations are studied. (3 and 3Sp) Merrill

8, 8a. Aircraft Powerplants. Formerly Aero 8, 8a. Introduction, operation, maintenance and repair of modern air cooled aircraft engines, including design, disassembly and re-assembly 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. Formerly Aero 9, 9a. Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel, injection systems, magnetos, generators, and voltage control system, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism,
induction systems and superchargers, fuels and lubricants. Five lectures, five labs. (4 and 4W) Hill

10. 10a. Aircraft Powerplant Maintenance. Formerly Aero 10, 10a. Training in alteration, maintenance and operation of aircraft powerplants, including periodic inspections, servicing, diagnosis of engine malfunctioning, and engine installation. Theory of operation and design characteristics of controllable, constant speed, hydromatic, electric and reversible propellers. Overhaul and maintenance of propellers. Pertinent Civil Air regulations. Five lectures, five labs. (4 and 4Sp) Hill


105. Aircraft Materials. Formerly Aero 105. Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria. (2W) Staff

106. Fundamentals of Turbo-Jet Propulsion. Formerly Aero 100. History, development and general principles of jet propulsion. Thrust and performance, combustion systems, metallurgy, fuels, fuel controls, lubrication and ignition systems, aerodynamic problems, applications. (3F) Summers


108. Advanced Turbo-Jet Propulsion and Gas Turbines. Formerly Aero 102. Extension of fundamental theory, axial and centrifugal flow compressors, gas turbines, jet propulsion, turbo-prop engines. Prerequisite: Two lectures, one lab. (3W) Summers

109. Elementary Aircraft Design. Formerly Aero 103. Basic constructional concepts relating to aircraft design. (3F) Summers


111. Airline Maintenance and Fixed Base Operations. Formerly Aero 126. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Admin.; interline agreements, promotion and publicity. (3Sp) Staff

112. Aeronautics Seminar. Formerly Aero 130. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2F, W, Sp) Staff

113. Airport Planning. Formerly Aero 132. The airport and the community airway and airport traffic control. Airport types, fundamental requirements, planning and construction. Lighting, building and hangar design. Special problems and miscellaneous facilities. (3Sp) Staff

114. Aircraft Electrical Systems and Equipment. Formerly Aero 134. The more complex electrical systems used in larger aircraft. Prerequisite: ITE 10, 71. Three lectures, one lab. (4Sp) Staff


117. Aerospace Vehicle Weight Analysis. A study of the control of weight and balance of flight vehicles in their empty and loaded weight conditions, and the relationship of the center of balance to the flight characteristics of the airfoil. (3F) Merrill

118. Aircraft Hydraulics and Servos. Basic principles related to fluid power transmission, covering a wide range of industrial and aerospace applications including servo mechanisms. Course is open to all majors in the ITE Department. (3W) Merrill

119. Airworthiness Procedures. A study of airworthiness standards in the manufacture of new aircraft and the in-service airworthiness standards prescribed by the manufacturers and the Federal Aviation Agency. (3Sp.) Merrill

Automotive Courses

20. Driver Education. Formerly IE 13. How to drive an automobile correctly and safely. Traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; and actual supervised training in dual-control cars. Two lectures, lab arranged. (F, Sp, Su) Willey

22. Automotive Diesel Engines. Formerly Auto 22. Four-stroke cycle and two-stroke cycle Diesel engines used in trucks and tractors. (4W) Staff

23. Heavy-duty Tractors. Formerly Auto 23. Power transmission units used on trucks and tractors. (6F) Staff


25. Auto Electrics. Formerly Auto 5. Ignition, batteries, generating systems, and cranking motors. (4F) Slough


27. Steering Correction. Formerly Auto 1. Brakes, steering mechanisms, suspension systems, frames, balance, and alignment. (4F) Willey

28. Automotive Engines. Formerly Auto 2. Covers modern automobile engines, including cooling and lubrication. (4W) Willey

29. Driving Mechanisms. Formerly Auto 3. Clutches, transmissions, U-joints, drive lines, and rear axle assemblies. (4Sp) Staff

30. Automobile Chassis. Formerly Auto 51. A general course on brakes and steering units. Open to any student who wishes to learn minor service procedures. (3F) Staff

32. Automobile and Farm Power Plants. Formerly Auto 52. Provides actual experience in many of the service operations on the engine and its accessories. Includes spark-ignition and diesel engines. (3Sp) Staff

33. Automobile and Farm Engine Electricity. Formerly Auto 53. Stress service and repair procedures within the reach of the average driver. Covers battery and magneto ignition and includes the major electrical systems. (3Sp) Staff

34. Auto Mechanics for the Driver. Formerly Auto 55. 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) Staff

35. Fender Reconditioning. Formerly Auto 12. Modern processes of straightening and priming fenders. (6F) Willey


37. Body and Fender Repair. Formerly Auto 61. Covers basic fender and body repair processes for insurance adjusters and those who desire to do their own work. (5W) Willey

121. Frame, Suspension, and Steering Systems. Formerly Auto 101. An advanced course in steering geometry and steering problems. Power brakes and power steering devices are included. Prerequisites: ITE 27, Math 34, 44. (3F) Wright

122. Internal Combustion Engines. Formerly Auto 102. Manufacturing and design characteristics of different engines. Attention is given to precision reconditioning of cylinders, crankshafts, and other engine units. Balance and force problems are included. Prerequisites: ITE 28, Math 44. (3W) Staff

123. Automatic Transmission. Formerly Auto 103. Includes modern automatic transmissions and torque converters, electric clutches, and hydraulic systems. Prerequisite: ITE 29. (3 Sp) Wright

124. Fuel Injection Systems. Formerly Auto 122. Various types of Diesel and gasoline injection systems are included. Modern testing equipment is used. Prerequisite ITE 22. (3W) Wright

125. Carburetion. Formerly Auto 151. Combustion processes, heat cycles, and fuel characteristics are studied in connection with internal combustion engine carburetion problems. Prerequisites: ITE 24, Math 36. (3F) Staff

126. Motors, Generators, and Magneto. Formerly Auto 152. An advanced course covering technical phases of these units. Laws of Physics are applied. Prerequisites: ITE 26 and preferably Physics 19. (2W) Staff

127. Metal Refinishing. Formerly Auto 162. Principles and practices in metal preparation and refinishing processes are discussed. Lacquer, enamel, novelty finishes, and special protective applications are included. Attention is given to paint mixing and color balance problems. Prerequisite: Physics 19 or equivalent work on light and color. (3Sp) Willey

130. Driver Education and Traffic Safety. Formerly IE 113. To acquaint prospective teachers and others with available instructional materials, techniques, procedures and problems related to a driver education course. (3F, Sp, Su) Willey

131. Teaching Driver and Safety Education. A practical application of classroom and behind-the-wheel teaching techniques in driver education. Consideration is given to nationally recognized methods of demonstration. (3F, Sp, Su) Willey

132. Problems in Driver and Safety Education. Formerly IE 114. For teachers, school administrators, and others responsible for directing or supervising safe driving programs.
in the school or community. The course includes traffic and liability law, insurance, stimulants and depressants, public relations, safety research, and applied psychology. (3W, Su) Willey, Staff

133. Driver Training Teacher Workshop. Formerly Auto 114S. (2Su) Staff

135. Heat Engines. Introduction to elementary thermodynamics and basic heat power cycles. Prerequisite: Physics course covering heat (Physics series: 17, 18, 19). Three lectures, one lab. (4Sp) Summers

139. Power Mechanics. Formerly IE 149. 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

Drafting Courses

80, 81, 82 Technical Drawing. Formerly IE 15, 16, 17. Lettering, use of instruments, geometric construction, sketching, multiview drawings, dimensioning theory and practice, sectional views, auxiliary views, screw threads and threaded fasteners, keys, working drawings and specifications, intersections, developments, and pictorials. View relationship, spatial visualization, and problems relating to points, lines, and planes. One lecture, and two labs. (3F, 3W, 3Sp) Wallis


89. Aircraft Drawing. Formerly IE 19. Aircraft drafting techniques, numbering systems, change methods, and technical specifications. Prerequisite: ITE 82. One lecture, two labs. (3Sp) Staff

182. Architectural Drafting and Specifications. Fundamentals of architectural drafting; plans, details, conventions, specifications; units of structure and their representation. Prerequisite: ITE 82 (3F) Staff

183. Machine Drafting. Drafting techniques, symbols, conventions used in the representation of gears, cams, jigs, and fixtures. Prerequisite: ITE 82 (3W) Staff

184. Technical Illustration. Methods of converting orthographic drawings into three-dimensional drawings. Shading, inking, and air-brush techniques are introduced. Prerequisite: ITE 82 (3Sp) Staff

185. Production Drawings. Advanced techniques of production drawings; detail, assembly production dimensions, tolerances, position tolerances, classes of fits, surface quality, and specifications. Prerequisite ITE 82 (3Sp, Su) Staff

Electricity-Electronics Courses

71. Technical Electricity-Electronics. Formerly IE 71. Fundamentals of direct current electricity. Includes a study of the basic concepts, circuits, laws, measurements, and electrical energy sources as they relate to DC electricity. Practical applications are given in laboratory exercises. Prerequisite: Math 34 or equivalent. (3F, W, Sp) France

72. Technical Electricity-Electronics. Formerly IE 72. Fundamentals of alternating current electricity. Includes a study of the basic concepts, circuits, laws, measurements and electrical energy sources as they relate to AC electricity. Practical applications are given in laboratory exercises. Prerequisite: Math 44. (3W) France

73. Technical Electricity-Electronics. Formerly IE 73. Fundamentals of vacuum tubes and semiconductors. Includes a study of the basic concepts, characteristics, parameters, specifications and applications of vacuum tubes and semiconductors. Practical analysis is accomplished through laboratory exercises. Prerequisite: ITE 72. (3Sp) France

79. Practical Electric Wiring. Formerly IE 68. Includes a study of basic circuits, materials, inspection procedures, electrical codes and practices related to the installation of electrical wiring in the home and small public buildings. Practical application will be centered around the actual wiring of a mock up home. Two lectures, one lab. (3W) France

173. Basic Electronic Circuits. An introduction to and analysis of the basic electronic circuits commonly found in a wide variety of electronic devices. The concepts of power supplies, oscillators, amplifiers, and other basic circuits will be studied as they may relate to such devices. Practical analysis is accomplished through laboratory exercises. Prerequisite: ITE 73 (3W) France

174. Electronic Circuits and Systems for Radio. A study of the fundamentals of radio communication and of the concepts of electronic circuits and systems employed in the modern radio receiver. Practical application will be centered around the construction, and testing of a radio receiver. The principles of radio transmission and transmitters will also be introduced. Prerequisite: ITE 73 (3W) France

175. Industrial Electronics. An introduction to and study of the concepts of electronic devices and circuits used in industrial applications for measurement and control purposes. Practical application will be accomplished through laboratory exercises. Prerequisite: ITE 73 (3 Sp) France

Metals Courses

50. General Metals. Formerly IE 50. Development of the skills of general metalwork-
Welding Courses

40. Fundamentals of Welding. Formerly Weld 97. 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 oxyacetylene and arc processes, brazing of ferrous and non-ferrous metals, silver soldering and oxyacetylene cutting. Two lectures, two two-hour labs. (3F, Sp) Palmer

41. Oxy-Acetylene Welding. Principles and practices of oxy-acetylene welding in the flat and horizontal positions on mild steel plate. Mechanical and physical properties of ferrous metals, basic joint design and flame cutting procedures. Designed for those interested in welding metallurgy technology as a major. (3F) Staff

42. Oxy-Acetylene Welding. Principles and practices of oxy-acetylene welding in the vertical and overhead positions on mild steel plate. Process metallurgy of basic ferrous and non-ferrous metals, hard-surfacing procedure. Prerequisite: ITE 41. (3W) Staff

43. Oxy-Acetylene Welding. Principles and practices of oxy-acetylene welding of aluminum, cast iron, and stainless steel. Principles of and practice in brazing, braze-welding, sliver brazing, and the welding of galvanized steel. Prerequisite: ITE 42. (3 Sp) Staff

44. Electric Arc Welding. A basic course providing the 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. Designed for welding metallurgy majors. (3 F) Staff

45. Electric Arc Welding. Presents the principles and practices of electric arc welding on mild steel in the horizontal and vertical positions. Emphasis on various processes using the principle of the electric arc. Prerequisite: ITE 44. (3 W) Staff

46. Electric Arc Welding. Designed to present the principles and practices of electric arc welding on mild steel in the overhead position. Technical information on the various metals used in industry today. Prerequisite: ITE 45 (3W) Staff

47. Acetylene Welding. Formerly Weld 91. Principles and practices in fundamentals of oxyacetylene welding and cutting. A general service course open to all university students. Two lectures, two two-hour labs. (3F, W, Sp) Palmer

48. Aero Welding. Formerly Weld 92. A basic course providing an introduction to the fundamental principles of oxyacetylene welding and cutting as it applies to aircraft production and repair as set forth by Civil Air Regulations. Two lectures, two two-hour labs. (3W) Palmer

49. Electric Arc Welding. Formerly Weld 94. The basic course providing for principles and practices in the latest types of electric arc welding equipment. Emphasizes safety measures and methods used in the welding of mild steel in the flat position. A general service course open to all university students. (3F, W, Sp) Palmer

141. Welding Design and Estimating. Designed for detailed study of the principles involved in welding design and estimating. Laboratory practice involves the making of welded structural designs and the estimating of costs, weights, time, and service ability of various projects. Prerequisite: ITE 46. (3 F) Staff

142. Welding Design and Inspection Methods. Principles and processes involved in the design and inspection of welded structure. Laboratory work consists of making design drawings of assigned mechanical objects and running inspection test on sample welds to prove the useability of the designed weld joints. Prerequisite: ITE 141. (3 W) Staff
143. Advanced Welding Processes. Designed to acquaint students with the principles and processes involved in the various inert gas welding methods. Laboratory practice includes work with the various inert gas welding machines. Prerequisite: ITE 142. (3 Sp) Staff

144. Welding Metallurgy-Ferrous. A detailed analysis of different heat effects and treatments of ferrous metals. Laboratory exercises include polishing and etching of metal specimens and microscopic study of their internal structures. Prerequisite: A basic welding course. (3 F) Staff

145. Resistance Welding. Designed for detailed study of the principles involved in resistance welding. Laboratory practice includes the making of resistance welds, and the inspection of them by physical and microscopic tests. Prerequisite: 144 and 144-A. (3 W) Staff

146. Weldability of Ferrous Metals. Designed for detailed study of the weldability of ferrous metals in terms of the metallurgy involved. Laboratory work consists of making sample welds and the inspection and testing of these welds by various methods. Prerequisite ITE 144. (3 W) Staff

146-A. Weldability of Non-Ferrous Metals. Designed for detailed study of the weldability of non-ferrous metals in terms of the metallurgy involved. Laboratory work consists of making sample welds and the inspection and testing of these welds by various methods. Prerequisite: ITE 144-A. (3 Sp) Staff

147. Advanced Electric Arc Welding. Formerly Weld 191. A continuation of ITE 49. Information and instruction is given for welding in the vertical and overhead positions. Consideration is given to basic welding metallurgy and the weldability of metals. Prerequisite: ITE 49. (3F) Staff

149. Heat Treating of Ferrous & Non-Ferrous Metals. Designed to provide training and some research work in the field of Heat-treatment of Ferrous and non-ferrous metals. Laboratory work includes exercises in the various methods of Heat-treating ferrous and non-ferrous metals. Prerequisite ITE 144-A. (3 Sp) Staff

Woods Courses

61, 62, 63. Technical Woods. Formerly IE 61, 62, 63. Study and practice in fundamental hand tool processes; the use of common woodworking machines; the study of woods and other materials related to wood construction; and the design and construction of furniture and other advanced projects. One lecture, two labs. (3F, 3W, 3Sp) Slack

64. Upholstering. Formerly Auto 62. Modern automobile and furniture upholstering processes. Students upholster their own units as they learn. (3W) Slack

69. Woodwork for Everyone. Formerly IE 74. Open to all, both men and women, who have a desire to work with wood. Instruction is given in the fundamentals of woodworking and includes training in the use of both hand tools and woodworking machines. Projects are selected and built by students; a wide latitude in the selection of projects is afforded. Instruction is given in furniture repair and in the basic principles of wood finishing and re-finishing. (2 to 6F, W, Sp) Staff

160. Cabinet Making and Furniture Construction. Advanced cabinet and furniture making including construction design and opportunity for application of original designs. Practical work is provided in the construction of fine furniture and built-in cabinet work. Prerequisite: ITE 63 (3F) Slack

162. Industrial Woods. In this course, considerable time is spent in the development, construction and use of woodworking projects designed for high school teaching purposes. The development of jigs and fixtures for use in mass production techniques in high school shops is introduced through practice in production line runs. Prerequisite: ITE 63 (3 W) Slack

163. Dwelling Construction and Estimating. A study of the principles of carpentry and construction as they apply to dwellings. The building codes, specifications and regulations for construction are applied to the making of a scale model structural home. Layout, strength of materials and procedure emphasized. Prerequisite: ITE 63 (3 Sp) Slack

164. Wood Finishing. Study and practice in the kinds of opaque and transparent finishes for woods as applied by brush, spray or wipe on methods. Attention is given to the types of finishes, stains and methods of polishing as well as application. Prerequisite: ITE 61 (3 W) Staff

168. Industrial Arts for Elementary Schools. Formerly IE 180. 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. (3 W) Staff
Professional Courses

100. Principles and Objectives of Industrial Education. Formerly IE 107. A comprehensive study of the philosophy and purposes of Industrial Education programs and their place in the total program of modern education. (3Sp) Staff

101. Observation in Student Teaching. Formerly IE 101. Serves as a preliminary to the regular student teaching in Industrial Education. Students are assigned to various schools within the area to observe teaching in Industrial Education. (1W) Wallis

102. Instructional Aids. Formerly IE 102. Instruction in the purpose, types, sources, preparation and proper use of instructional aids, including samples, models, charts, graphs, slides, still film, movie film, sound film, graphics and other aids suitable for classroom and laboratory use. (3F) Staff

103. The General Shop. Formerly IE 111. Comprehensive study of the types of "General Shop," its advantages and limitations; content and organization of subject matter; method of teaching and shop plans. General shop projects, shop plans and new trends in content and equipment are given special consideration. (3Su) Staff

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

190. Special Industrial Education Workshop. Formerly IE 190. Allows for conducting special workshops, as needed, especially for the in-service training of Industrial Education teachers, supervisors, and administrators. May be repeated as needed providing the workshops are different, but if the credit is to be used toward a Baccalaureate or Master's Degree, limitations shall be placed by the department or a student's Graduate Committee. Credit arranged. (F, W, Sp, Su) Staff

191. Industrial Safety Education. Formerly IE 118. The psychology and philosophy of accident causation and prevention in school, home, community, and industry. Stress the various aspects of safety in many areas and includes organization, administration, and coordination of safety education programs. (3W, Sp, Su) Hailes

192. Personnel Relations. Formerly IE 120. Training for leadership in industry as foremen, supervisors, and directors. Problems in organizing, supervising, training, and directing personnel. Directed conferences based on student experiences and directed studies in leadership problems and principles. (3F, Sp) Hailes

193. Shop Organization and Management. Formerly IE 110. Teaches students to organize and manage an Industrial Education Shop of the unit, general, or multiple activity type. Students prepare for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. (3W, Su) Staff

194. Student Teaching in Industrial Education. Formerly IE 112. Students observe and teach in Industrial Education programs throughout the state. Under close supervision, they do practice teaching in various Industrial Education courses in junior, senior or post high schools. (9W) Staff

195. Methods in Industrial Education. Formerly IE 121. Latest techniques of teaching applied to individual and group instruction in Industrial Education. Students have opportunity to use these different methods in presenting lessons before the class. (3W) Staff

196. Organization and Development of Instructional Materials. Formerly IE 129. Selection and arrangement of teaching materials to be used in Industrial Education course work. (3Sp) Staff

197. Honors Studies. Formerly IE 197. Advanced work for qualified students. Work is initiated by a student and may consist of a special individual project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: A satisfactory grade point average, recommendation of instructor and approval of the College of Engineering Honors Committee. 1-3 credits arranged. (F, W, Sp) Staff

198. Special Problems in Industrial Education. Formerly IE 187. For qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Credit arranged. (F, W, Sp, Su) Staff

199. Related Technical Training in Vocational Education. Formerly IE 150. 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)

Graduate Courses

200. Industrial Education Experimental Lab. Formerly IE 185. 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, Su) Staff

207. Philosophy of Vocational Education and the Practical Arts. Formerly IE 207. Designed to enrich and expand understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. (3F, Su) Staff

209. Curriculum Development in Industrial Education. Formerly IE 209. The significance, importance, and use of the course of study in industrial education. Actual construction of a comprehensive course of study for one of the phases of industrial education. Prerequisite: ITE 104. Three lectures. (3W, Su) Staff

210. Trends in Industrial Education. Formerly IE 181. A preview of industrial education tomorrow; what industrial education will do. The evaluation of educational and industrial thought; the source of materials to meet present day trends. (3Su) Staff

224. History of Industrial Education. Formerly IE 224. Historical developments of manual and industrial education from the early leaders to the present. Emphasis is given to the influence that various leaders and movements in both Europe and America have had upon present-day objectives of industrial arts and vocational industrial education. (3W, Su) Staff

232. Aerospace Education. An introduction to aerospace for teachers in elementary and secondary schools, to include such content areas as: (1) A study of the principles of flight, (2) Knowledge of the earth’s atmosphere, (3) The control of aircraft in flight, (4) Information on the federal airways and airports, (6) The principles of jet propulsion, and (6) An opportunity to take an orientation flight, and also receive some basic instruction in handling an aircraft in flight. Nationally known speakers will be used as resource specialists throughout the course. (3Su) Summers

240. Cooperative Industrial Programs. For potential coordinators of part-time cooperative industrial and technical classes. Essential information for conducting federally and nonfederally reimbursed work experience industrial classes in secondary and post-high schools. (3Su) Staff

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. (3Sp, Su) Staff

254. Measurement in Industrial Education. Construction and use of the various types of tests and rating scales used in Industrial Education. Emphasizes measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods necessary for intelligent use of the tests. Prerequisite: Psychology 112. (3Sp, Su) Staff

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. (3W, Su) Staff

267. Reading and Conference. Formerly IE 277. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of department adviser; investigation is carried on under direction of the major professor. Credit arranged. (F, W, Su) Staff

270. Seminar in Industrial Education. Formerly IE 276. Gives opportunity for investigation and reporting of individual problems. (1 to 2Sp, Su) Staff


275. Research in Industrial and Technical Education. To provide teachers, supervisors and directors of industrial and technical programs with research methods and techniques which are applicable to their programs. Includes interpretation of various kinds of research. The conducting of a research project is part of the class activity. (3F, Su) Staff

355. Internship in Industrial and Technical Programs. Designed for the advanced student working toward the Doctor of Education degree in Industrial Education. Student works under the direct guidance of an administrator or supervisor of Industrial and Technical programs in the public schools. Credit arranged. (F, W, Sp, Su) Staff

365. Advanced Independent Study in Industrial Education. Provides opportunity for advanced student to do independent study in the field of Industrial and Technical education. Credit arranged. (F, W, Sp, Su) Staff

371. Research for the Doctorate Thesis in Industrial Education. Credit arranged. (F, W, Sp, Su) Staff
The Department of Manufacturing Engineering offers curricula leading to the Bachelor of Science and Master of Science Degrees.

Manufacturing Engineering is a branch of engineering in industry whose function is to plan the processes of economic manufacture, to specify or design the manufacturing tools and equipment, and to integrate the facilities required for producing given products with minimal expenditure of time, labor, and materials. Some typical responsibilities of manufacturing engineers are: to develop the manufacturing plan for each product so that it can be made with a minimum of time, labor, and materials; to interpret product designs to the shop, and inform product designers of shop limitations and capabilities; to coordinate manufacturing projects so that products are delivered on schedule and within costs; to exploit new processes, materials and methods that lead to lower costs and a better product; to provide and allocate facilities so that the company maintains a competitive advantage.

Manufacturing engineers act as catalysts in today’s industry, translating the exacting concepts of the product designer into reality. With the rapid development of new technology, the education of the manufacturing engineer takes on new importance.

National surveys indicate that increasing numbers of manufacturing engineers are needed. As industrial production expands in Utah and across the nation, opportunities will continue to increase.

The Manufacturing Engineering Laboratories, the Metallurgy, Inspection and Senior Students’ Design room are all equipped with modern facilities for teaching, for engineering experimentation and for student development in Manufacturing Engineering.

The Department coordinates a program of summer employment for Junior students. This industrial experience greatly benefits the student in his understanding and application of the engineering concepts studied in classes. Field trips to industrial plants are conducted each year for Junior and Senior students.

The Department is closely affiliated with the American Society of Tool and Manufacturing Engineers. There is an active student Chapter of the Society on Campus which promotes the professional and social interest of the Manufacturing Engineering students.

Manufacturing Engineering Curriculum

The following curriculum leading to the Bachelor of Science degree in Manufacturing Engineering resulted in Utah State University receiving the American Society of Tool and Manufacturing Engineers 1965 National Education Award.
This award connotes recognition and acceptance of the curriculum by the National Society.

**FRESHMAN YEAR**

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**SENIOR YEAR**

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**Graduate Study**

The graduate program in Manufacturing Engineering provides course work leading to the Master of Science Degree. To meet individual interests, the graduate student may select one of three options to be taken along with the Manufacturing Engineering core. These options are: Engineering Administration, Manufacturing Systems Design, Applied Statistics and Computer Science. General requirements for the Master's degree are:

1. To be accepted as a candidate an applicant must: (a) hold a Bachelor of Science degree from an institution of recognized standing in one of the fields of engineering or physical science; (b) have had adequate preparation for graduate study in the chosen field of specialization; and (c) show promise of doing well in advanced study as judged by previous scholastic record and other achievements.

2. The Master of Science curriculum must include at least 45 credits numbered 100 or above, with at least 10 credits in courses numbered 200 or above. A total of 9 credits of acceptable graduate work may be transferred from another approved graduate school. A maximum of 18 credits may be taken at off-campus residence centers maintained by Utah State University. A minimum of 15 credits, exclusive of thesis, must be completed on the Logan Campus. Additional requirements such as qualifying examination, final examination, time limit, etc., as outlined by the School of Graduate Studies, are included.

3. Selection of specific courses in the curriculum will be under advisement of a Supervisory Committee which is appointed by the Dean of the Graduate School.

The candidate's program will include a selection of courses in the following areas:

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</tbody>
</table>

1See College of Engineering Introduction for details of Mathematics and Humanities requirements.

2Two credits are given for MS or AS.

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

Minor—option in Engineering Administration, Manufacturing Systems Design, or Applied Statistics and Computer Science) Minimum ...................................... 16

Total .................................................................................. 45

An integrated program may be selected from the following courses:

Manufacturing Engineering Core:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Statistics (Ap St 131, 132, 171)</td>
<td>11</td>
</tr>
<tr>
<td>Computer Science (CS 167)</td>
<td>3</td>
</tr>
<tr>
<td>Quality Control (Mfg E 157)</td>
<td>3</td>
</tr>
<tr>
<td>Mfg Processes &amp; Materials (Mfg E 168)</td>
<td>3</td>
</tr>
<tr>
<td>Adv Production Engineering (Mfg E 258)</td>
<td>3</td>
</tr>
<tr>
<td>Methods Engineering (Mfg E 280)</td>
<td>3</td>
</tr>
<tr>
<td>Manufacturing Seminar (Mfg E 287)</td>
<td>2</td>
</tr>
<tr>
<td>Special Problems (Mfg E 288)</td>
<td>3</td>
</tr>
<tr>
<td>Automation Systems (Mfg E 290)</td>
<td>3</td>
</tr>
<tr>
<td>Thesis (Mfg E 298)</td>
<td>9</td>
</tr>
</tbody>
</table>

Manufacturing Systems Designs:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Frame Analysis (ME 106)</td>
<td>5</td>
</tr>
<tr>
<td>Mechanical Analysis (ME 131)</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical Design (ME 132)</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical Design Projects (ME 133)</td>
<td>4</td>
</tr>
<tr>
<td>Dynamics of Machinery (ME 135)</td>
<td>4</td>
</tr>
<tr>
<td>Feedback Control (EE 160)</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Mechanics of Materials (ME 165)</td>
<td>4</td>
</tr>
<tr>
<td>Dimensional Analysis and Similitude (CE 260)</td>
<td>4</td>
</tr>
</tbody>
</table>

Manufacturing Engineering Courses

50. Orientation. Lectures, and films to acquaint the student with the work of the Manufacturing Engineer. (1Sp) Staff

52, 53. Production Processes. Lathe, shaper, milling, and grinding operations. Two lectures, one lab. (3 taught on demand) Staff

56. Machine Lab for Engineers. Acquaints the student with basic machine tool operations. Two lectures, one lab. (3F, W, Sp) Staff


137. Work Simplification and Layout. A study of management techniques with emphasis on methods improvement, time study analysis, plant layout and material handling procedures, particularly adapted to Business Administration majors. (4W) Staff

148. Manufacturing Processes. Fundamentals of manufacturing processes; shows possibilities and limitation of these processes and their application to fabrication of industrial products. (9F, Sp) Child


151. Tooling Systems—Operations. Develops an understanding of the capacity and versatile usefulness of the fundamental machines and equipment used in manufacturing engineering. Prerequisite: Mfg E 56. Three lectures, two labs. (3F) Somers

152. Tooling Systems—Planning. Deals with the analysis of the product design, planning procedures, routing methods, and the organization of the operational sequence. Prerequisite: Mfg E 151. Three lectures, two labs. (5W) Shaw

153. Tooling Systems—Standards. Studies the utilization of standard production equipment, standard tooling and standard gaging methods adapted to the engineering of manufacturing process. Prerequisite: Mfg E 152. Three lectures, two labs. (5Sp) Child

157. Quality Control. Non-destructive and destructive tests. Total inspection by sampling, frequency distributions, statistical analysis and control charts. Prerequisite: Mfg E 57. (3Sp) Somers

158. Manufacturing Analysis. Economics of tooling operations: the productivity of machines, tool maintenance, tool costs, and job estimating. Prerequisites: Mfg E 56, 148. (3F) Shaw

168. Manufacturing Processes and Materials. Emphasis is placed on materials composition and structures, and their adaptability to manufacturing processes and maximum production. Prerequisites: Mfg E 150, 158. (3Sp) Shaw

189. Motion and Time Study. An analysis of motion and time study as applied to manufac-
turing procedures, with emphasis given on work simplification, motion economy, time standards, and performance ratings. (3W, Sp) Child

181. Tool Design. The study and design of production tools such as gages, jigs, and fixtures. Includes tool design standards, tolerance, springs, cam layout, and techniques of preparing tools for production. Three lectures, two labs. Prerequisites: Mfg E 158, CE 103. (5W) Somers

182. Die Design. Emphasizes design and application of tooling to materials and products fabricated by press working production methods. Prerequisite: Mfg E 181. Three lectures, two labs. (5Sp) Somers

183. Plant Layout. A study of the utilization of space, machines, materials handling methods and equipment for economical production. Laboratory consists of organization and planning details for layout of production facilities. Prerequisites: Mfg E 148, 180. Two lectures, one lab. (3Sp) Shaw


187. 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. (2W, Sp) Staff

189. Honors Studies. Advanced work for qualified students. Work is initiated by a student and may consist of a special independent project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: A satisfactory grade point average, recommendation of instructor and approval of the College of Engineering Honors Committee. 1-3 credits arranged. (F, W, Sp)

258. Advanced Production Engineering. Techniques of value analysis and application to production planning. Includes techniques of cost estimating and the preparation of manufacturing proposals. Prerequisite: Mfg E 158. Three lectures. (3F) Shaw

280. Methods Engineering. Work measurements methods: the application of work simplification methods in industrial organizations. Prerequisite: Mfg E 180. Two lectures, one lab. (3W) Child

287. Manufacturing Seminar. Students prepare technical papers on suitable topics and present to Mfg E staff and graduate students. Two lectures. (2F) Somers

288. Special Problems. Special studies in Manufacturing Engineering. Preparations of technical reports based on individual research on special problems. Credit arranged. (F, W, Sp, Su) Staff

290. Automation Systems. Design of automated production systems; special emphasis on electronic, hydraulic and pneumatic controls as applied to numerically controlled and other automated production equipment. Prerequisites: EE 124, CE 144, Mfg E 181. Three lectures. (3Sp) Staff

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

Department of

Mechanical Engineering
(Mechanical Engineering, Chemical Engineering)

Head: Professor Reynold K. Watkins
Office in Engineering 180

Professor Richard A. Mayer; Associate Professors Izydor Eisenstein, A. R. McKay, Owen K. Shupe; Assistant Professors J. Clair Batty, Russell M. Holdredge, Alma P. Moser, Albert B. Smith, Dan H. Svenson, Edward W. Vendell1; Instructors Ross A. Nyman, Byard D. Wood.

The Department of Mechanical Engineering offers curricula leading to the Bachelor of Science, Master of Science and Doctor of Philosophy degrees.

Mechanical Engineering is the development of energy and the application of energy through ma-
chines and systems to the tasks of mankind. A machine may be anything from a crowbar to an aerospaceplane. The technical staffs of most industries, utilities, government agencies, and research foundations require mechanical engineers who specialize in various areas, such as: Aeronautics, Automotive Engineering, Nuclear Engineering, Petroleum Engineering, Industrial Engineering, Space Engineering, Thermodynamics, Heat Transfer, Machine Design, Power Production, Systems Engineering, Management, Equipment Sales, Refrigeration, 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 undergraduate 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 available.

Mechanical Engineering Curriculum

The following curriculum leading to the Bachelor of Science degree in Mechanical Engineering is accredited by Engineers Council for Professional Development. Freshman and Sophomore common Engineering curriculum are listed under “College of Engineering.”

The Junior and Senior curricula are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>Sp</th>
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</thead>
<tbody>
<tr>
<td>ME 111, 112, 116</td>
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<td>CE 103</td>
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<tr>
<td>EE 105, 124</td>
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<tr>
<td>CE 140, 141</td>
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</tr>
<tr>
<td>ME 143</td>
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<td>ME 130</td>
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<td>ME 160</td>
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<td>ME 161</td>
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<td></td>
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<td>Mfg E 148</td>
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<tr>
<td>Humanities</td>
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<td><strong>Total</strong></td>
<td>18</td>
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</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>Sp</th>
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</thead>
<tbody>
<tr>
<td>ME 131, 132, 133</td>
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<td>ME 117, 119</td>
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<td>ME 198</td>
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<tr>
<td>ME 150, 151</td>
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<tr>
<td>Technical Electives</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>17</td>
<td>17</td>
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</tbody>
</table>

Chemical Engineering Curriculum

A two-year pre-Chemical Engineering curriculum is offered with the same required courses as the two-year core curriculum in Engineering except for the substitution of Chemistry 3, 4, and 5 for Chemistry 10, 11 and Economics 51.

Graduate Study

This Department offers a graduate program leading to the MS and PhD degrees in Mechanical Engineering. The program is designed for specialization in Applied Mechanics, Materials, Fluid Mechanics, Nuclear Engineering, and Propulsion and Energy Conversion. It is understood that: (1) an acceptable course of study will be worked out by the student with a

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

2Credits for MS I and II are (2F, 2W, 2S) and credits for AS I are (1F, 1W, 2S) and for AS II are (2F, 2W, 1S).

3Technical electives may be selected from the following sequences: Math 140, 141, 142; ME 190, 191, 192; or from the following courses after consultation with your adviser: ME 106, 135, 162, 165, 166, 172, 183, 185, 187; Physics 122, and others.
supervisory committee which will be appointed by the Dean of the School of Graduate Studies; (2) the study and research program will satisfy all of the requirements listed in this catalog under the School of Graduate Studies. In addition to the prescribed requirements, a minimum of 9 credit hours of mathematics beyond that required for the BS is required. Thesis may be replaced by approved courses by graduate practicing engineers who have had project experience.

Following is a typical course of study leading to the degree of Master of Science in Mechanical Engineering:

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>Sp</th>
<th>Su</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 130, 131, 132</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<tr>
<td>ME 214, 201, 210</td>
<td>5</td>
<td>3</td>
<td>5</td>
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<tr>
<td>ME 240, 241, 242</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ME 261</td>
<td>5</td>
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<td>ME 280</td>
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<tr>
<td>CE 280</td>
<td>4</td>
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<tr>
<td>ME 298</td>
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<td>9</td>
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</tbody>
</table>

Total 15 14 14 9

Depending on the student’s specialization some of the above courses may be replaced by such courses as: ME 202, 203; CE 201, 202, 203; CE 270, 271, 272, and CE 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. One lab. (1W) Nyman, Smith


111, 112, 113. Engineering Thermodynamics. Basic concepts and laws are covered from both macroscopic and microscopic viewpoints. Also included are an introduction to heat transfer, available energy, combustion, and application. Prerequisites: Math 110 and Physics 22. Three lectures. (3F, 3W, 3Sp) Batty

116, 117. Engineering Heat Transfer. One and two-dimensional steady state conduction, laminar and turbulent flow, convective heat transfer, natural convection, radiation, transient and periodic heat transfer, applications and laboratory tests. Prerequisites: ME 160 and CE 141. Classes must be taken in sequence. Three lectures. (3F, 3Sp) Batty

119. Thermodynamic Systems. Application of the laws, concepts, and procedures of thermodynamics, and gas dynamics to turbo-machinery, propulsion, gas and vapor turbine cycles, expanders and compressors, and other apparatus. Both analytical and experimental approaches. Prerequisites: ME 117 and 143 concurrently. Three lectures and one lab. (3W) Batty

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 40 and 99. Three lectures, one lab. (4W, Sp, Su) Watkins

130. Kinematics. 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: CE 92. Two lectures, two labs. (4F, 4Sp) Eisenstein

131. Mechanical 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: CE 108, ME 130. Three lectures, one lab. (4F) Eisenstein

132. Mechanical Design. Application of the method of stress analysis to the design of machine components. Analysis of static and dynamic forces and stresses in machine elements. Design of machine part by rationalization and empiricism. The main topics are: fastenings, power screws, pressure vessels, springs, shafting, coupling, clutches and brakes, bearings with sliding and rolling contact, lubrication, etc. Prerequisite: ME 181. Two lectures, two labs. (4W) Eisenstein
133. Mechanical 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: ME 132. Two lectures, two labs. (4Sp) 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. Prerequisites: ME 130 and CE 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. (8Sp) 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: ME 112, CE 92 and CE 141. Three lectures, one lab. (4Sp) Staff

150, 151. Science of Materials. The basic principles of solid state physics are used to explain the engineering properties of materials including metals, alloys, ceramics, plastics, etc., with temperature range from ultra-high to cryogenics. Prerequisite: Physics 22. MB 150 is prerequisite to ME 151. Three lectures. (3W, 8Sp) 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) Staff

161. Introduction to Advanced Dynamics. Motion of a particle, motion of a system of particles, moving reference frames, motion of a rigid body, conservation of linear and angular momentum, conservative and non-conservative force fields, Euler's equations, Hamilton’s principle, Lagrange's equations for holonomic and non-holonomic systems. Free, damped, and forced vibration of a linear one-degree of freedom system. Prerequisite: ME 160. Four lectures. (4W) Staff

162. Mechanical Vibrations. Free, damped, and forced vibration of systems within degrees of freedom, matrix iteration technique, the method of Holzer, vibration of elastic bodies. Prerequisite: ME 161. Four lectures. (4Sp) Staff

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 CE 103. Four lectures (4Sp) Watkins

166. Introduction to Continuum Mechanics. Introduction and application of tensors as applied to the mechanics of solid or fluid continua. Tensor properties of stress, strain, and strain rate. General discussion of Cartesian tensors. Equations of motion and compatibility. Relations between stress, strain, and strain rate; for anisotropic and isotropic elastic, plastic, and viscous solids; and for compressible viscous fluids. Beltrami-Michell equations and Navier-Stokes equations. Prerequisites: CE 103. Recommended ME 165. (Three lectures) (3F) Staff


185. Rocket Engines. Basic principles of rocket engines including control mechanisms for both solid and liquid propellant engines. Prerequisites: Chemistry 12, and ME 160 or concurrent registration for ME 160. ME 149 and ME 116. Three lectures, one lab. (4F) 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; reac-
tor fuels and fuel processing; thermal aspects of reactors; type of reactors. Three lectures. (3W, 3Sp, 3F) Shupe

193, 194, 195. Nuclear Reactor Laboratory. May be taken concurrently with ME 190, 191, 192. One Lab. (1F, 1W, 1Sp) Shupe

197. Honors Studies. Advanced work for qualified students. Work is initiated by a student and may consist of a special individual project under the direction of a faculty member, or of advanced study in connection with an established departmental course. Prerequisite: A satisfactory grade point average, recommendation of instructor and approval of the College of Engineering Honors Committee. (F, W, Sp) 1-3 credits, arranged. Staff

198. Mechanical Engineering Seminar. Selected topics of interest to Mechanical Engineers are presented and discussed by members of the class and specially qualified visitors. Prerequisite: Senior standing in Mechanical Engineering. Two lectures. (1F, W, Sp) 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, W, Sp) 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. Prerequisite: ME 166. Three lectures. (3W) Staff

202. Theory of Plasticity. The analysis of stresses, deformation, and collapse in devices constructed of plastic material. Prerequisites: ME 166. Three lectures. (3Sp) Staff

210. 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. Prerequisites: ME 117, 214. Five lectures. (5Sp) Staff

214. Intermediate Thermodynamics. Advanced First and Second Law Topics. Complex Equations of State, Property Determination, featuring an approach using information, theory and statistics. Prerequisites: ME 143 and ME 117. (Note: may be taken as undergraduate elective with instructor's approval.) Five lectures. (5F) McKay

230. Advanced Kinematics. Review of vector analysis; Analytical methods; complex numbers and their application in kinematic analysis and synthesis; geometry of constrained motion; The Euler-Savary equation; Hartmann's Construction; Bloch Synthesis; Freudenstein's Theorem; The Hrones-Nelson synthesis of the four-bar linkage; the analysis of space mechanism. Prerequisite: ME 130. Three lectures. (3Sp) Eisenstein


251. Propellants. The physical chemistry of propellants and propellant combustion with special emphasis on the performance of solid and liquid propellants in rocket engines. Three lectures. (3F) Staff


290, 291, 292. Nuclear Reactor Engineering Principles. Transport theory and neutron diffusion; homogeneous reactors with and without reflector; heterogenous reactors; reactor materials; design, operation, and control of nuclear reactors; reactor kinetics. Three lectures. (3F, 3W, 3Sp) Shupe

293, 294, 295. Nuclear Reactor Laboratory. One laboratory. (1F, 1W, 1Sp) Shupe

298. Graduate Thesis. Credit arranged. (F, W, Sp) Staff
COLLEGE OF FAMILY LIFE
College of
Family Life

Department of Clothing and Textiles, 184
Department of Family and Child Development, 188
Department of Food and Nutrition, 191
Department of Homemaking Education, 194
Department of Household Economics and Management, 196
Combination Major in Family Life and Office Administration, 198

Degrees Offered:
- Bachelor of Arts
- Bachelor of Science
- Master of Science
- Doctor of Philosophy
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 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 work with children in nursery schools, day-care centers, and hospitals.

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

Bachelor's and Master's degrees are offered in each of these programs. Courses may be arranged so that an MS degree can be obtained through Summer Quarter work, providing that the research project is done on the job during the winter months. The PhD degree is offered in the Clothing and Textiles and the Food and Nutrition Departments only.

Curricula for the College of Family Life are 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:

197. Honor Studies. Advanced work for students approved by the College of Family Life Honors Committee. Special projects initiated by the student may be conducted under the direction of a faculty member or advanced study may be pursued in connection with an established departmental course. (3F, W, Sp) Staff

198. Honors Seminar. For qualified students approved by the College of Family Life Honors Committee. Exploration of concepts and problems of an interdisciplinary nature which have a common core within the various fields of Family Life, such as creativity, consumership, and problems of people at various stages of the family life cycle. Emphasis is placed on the dynamic interrelations between all processes in the behavior and development of the individual within a family setting. (2W) Staff

293. Research Methods. Research methodology for case studies, surveys, and experiments; design and style for theses and research reports; application of measurements and statistical techniques to professional problems in Family Life. A research report presenting and analyzing findings of a study in the student's major field is required. (3P) Compton Staff

Men and women in all colleges and departments of the University may take courses in the College of Family Life provided they have the prerequisite courses where these are required. Students may select courses most appropriate to their personal needs and interests.
184 College of Family Life

Department of

Clothing and Textiles

Head: Professor Norma H. Compton
Office in Family Life 303

Associate Professor Theta Johnson, Extension Specialist; Assistant Professors Virginia Lewis, Haruko Moriyasu; Instructor Ruth V. Clayton.

Undergraduate Study

The Department of Clothing and Textiles offers work leading to the Bachelor of Science and Bachelor of Arts Degrees with the following specializations:

1) General Clothing and Textiles
2) Fashion Merchandising
3) Fashion Design
4) Textile Technology and Research

Clothing and Textiles Major

The major in General Clothing and Textiles leads to opportunities in many areas such as work with commercial companies as consultant or educational director; teaching in stores, extension or trade schools; and custom dressmaking. The curriculum includes the following courses:

CT 10 Pattern Designing and Clothing Construction
CT 24 Introduction to Textiles
CT 105 Clothing Selection and Consumption
CT 106 Behavioral Science Aspects of Clothing
CT 115 Fashion Design
CT 120 Comparative Construction Techniques
CT 124 Weaving
CT 134 History of Textiles
CT 136 History of Costume
CT 140 Draping
CT 170 Flat Pattern Designing
CT 174 Advanced Textile Problems
CT 180 Tailoring
CT 186 Fashion Analysis
CT 191 Seminar
CT 195 Couturier Design

An additional ten credits should be selected from Anthropology 90, 92; Visual Arts 135; Psychology 161; Sociology 140, 144, 161; Economics 107, 171; Philosophy 50; and Political Science and History. It is recommended that majors also take courses in other departments within the College of Family Life.

Fashion Merchandising Major

The major in Fashion Merchandising prepares students for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion market reporter, fashion promotion work, owner-manager of small store. The curriculum includes the following courses:

CT 5 Design in Everyday Living
CT 10 Pattern Designing and Clothing Construction
CT 24 Introduction to Textiles
CT 105 Clothing Selection and Consumption
CT 106 Behavioral Science Aspects of Clothing
CT 115 Fashion Design
CT 120 Comparative Construction Techniques
CT 140 Draping
CT 174 Advanced Textile Problems
CT 186 Fashion Analysis
CT 191 Seminar
CT 190 Independent Study. Supervised work experience arranged.
FA-A70 Fashion Illustration
BA 100 Survey of Accounting Principles
BA 63 Salesmanship
BA 133 Management Concepts
BA 151 Marketing
BA 156 Principles of Advertising
An additional ten credits should be selected from Anthropology 90, 92; Visual arts 185; Psychology 161; Sociology 140, 144, 161; Economics 107, 171.

Fashion Design Major

The major in Fashion Design is planned for students interested in apparel designing. The curriculum includes the following courses and may lead to the Bachelor of Arts or Bachelor of Fine Arts degree:

CT 5 Design in Everyday Living
CT 10 Pattern Designing and Clothing Construction
CT 24 Introduction to Textiles
CT 105 Clothing Selection and Consumption
CT 106 Behavioral Science Aspects of Clothing
CT 115 Fashion Design
CT 120 Comparative Construction Techniques
CT 134 History of Textiles
CT 136 History of Costume
CT 140 Draping
CT 170 Flat Pattern Design
CT 180 Tailoring
CT 186 Fashion Analysis
CT 191 Seminar
CT 195 Couturier Design
FA-A 5 Beginning Design
FA-A15 Water Coloring
FA-A16 Figure Drawing
FA-A70 Fashion Illustration
FA-A115 Fabric Design
BA 151 Marketing Principles
BA 156 Advertising
L-FR 1, 2 Elementary French
3 or Two years High School French
L-FR 4a, 5a, 6a Intermediate French Readings
Recommended: FA-Th 152 and 153

Clothing and Textiles Minor

Students wishing a minor in Clothing and Textiles should take Clothing and Textiles 5, 10, 24, 105, 106, and six credits selected from other courses included in the Clothing and Textiles major.

Graduate Study

Master of Science Degree. The Clothing and Textiles Department offers the Master of Science Degree with research in the fields of Clothing or Textiles.

Doctor of Philosophy Degree. The Clothing and Textiles Department offers advanced study and research leading to the degree of Doctor of Philosophy in the Behavioral Science Aspects of Clothing and Textiles. To fulfill the requirements for the degree, the student must (a) Demonstrate a reading comprehension of either French or
German. (b) Pass a comprehensive examination in the field of specialization and in the minor field of Psychology or Sociology and Anthropology. (c) Successfully complete a research problem and a satisfactory dissertation. The student should consult the Graduate Catalog or the Head of the Department concerning other requirements.

**Clothing and Textiles Courses**

5. Design in Everyday Living. A study of the principles of design and color as related to the individual, the home, and family living. Recommended for all students in the University. (3F, W, Sp) **Staff**

10. Pattern Designing and Clothing Construction. Application of construction, fitting, and alteration principles with commercial patterns. Introduction to principles of flat pattern design and pattern making. (3F, W, Sp) **Lewis**

15. Clothing Selection for Men. Men's apparel as related to the wearer. Consideration is given to fundamentals of fabric and garment selection. Organized to meet the needs of students in all colleges of the University. (2W) **Staff**

24. Introduction to Textiles. A study of fibers, yarns, fabric construction and finishes as related to the appreciation, selection, use and care of current textiles. (3F, W) **Staff**

105. Clothing Selection and Consumption. Analysis of clothing needs of men, women, and children at various stages of the life cycle. Factors affecting clothing expenditures; production and distribution of textile products for the consumer market. Emphasis is placed upon clothing selection in relation to aesthetic and economic influences. (2W) **Staff**

106. Behavioral Science Aspects of Clothing. Clothing as a reflection of culture and personality. Analysis of clothing within selected primitive and contemporary cultures in relation to societal value structures. Study of the effects of clothing on the development, and adjustment of the individual self. (2F) **Compton**

**115. Fashion Design.** Fashion designing for reproduction, considering the wearer, the fabric, and the ensemble. Sources of inspiration for fashion designing. Individual experimentation through sketching with application directly to fabrics. (3Sp) **Lewis**

120. Comparative Construction Techniques. Development of judgment, originality, and skill in clothing construction with emphasis on alternative techniques and intricate construction detail. (3F, W, Sp) **Lewis**

124. Weaving. Fundamental principles of weaving. Emphasis is placed on the understanding of fabric construction and finishing through the weaving and finishing of yardage for place mats, napkins, aprons, and skirt or blouse fabrics. Prerequisite: Clothing and Textiles 24. (3W) **Clayton**

**134. History of Textiles.** A study of textile development from ancient times to the present as related to the socio-economic and political influence of the time. Emphasis is placed on fabric construction and motifs typical of each period. (3F) **Clayton**

**136. History of Costume.** A study of costume for men and women from ancient times to the present as related to the social, economic, and political influences of the times and their importance in the evolution and inspiration of modern dress. (3F) **Clayton**

140. Draping. Creative experiences in dress design by draping fabric on the dress form. Emphasis is placed on fitting and the effect of pattern, grain, and textures on design and dress. Problems consist of making a French lining and draping two garments. Prerequisite: Clothing and Textiles 120. (3W) **Staff**

170. Flat Pattern Designing. Application of the principles of design by flat pattern method. Emphasis is placed on the development and use of a basic sloper, and on the interpretation of a design in relation to clothing construction principles and in designing patterns. Prerequisite: Clothing and Textiles 120. Recommended: Clothing and Textiles 40. (3Sp) **Staff**

**174. Advanced Textile Problems.** Emphasis is placed on recent textile advances and research techniques. Consideration is given to physical and chemical testing and use of the microscope in identification of fibers. Prerequisite: Clothing and Textiles 24. Recommended: Chem 10, 11, 12. (3Sp) **Staff**

180. Tailoring. Application of tailoring techniques in the construction of suits and coats. Emphasis is placed on developing judgment and skill in the use of alternative techniques. Prerequisite: Clothing and Textiles 120. Recommended: Clothing and Textiles 170. (3F) **Staff**

radio and television; merchandise displays and fashion show production. Prerequisite: Clothing and Textiles 115 or consent of department. Recommended: Journalism 164, Speech 181, Business Administration 156. (3Sp) Lewis, Compton

190. Independent Study. Directed research and/or field experience in some areas of clothing and textiles. (F, W, Sp, Su) Staff

191. Seminar. Reports and discussions on newer developments in the Clothing and Textiles field. (2Sp) Compton

195. Couturier Design. A comprehensive analysis of the synthesis of knowledge and skill in clothing construction and design, required of all senior clothing and textiles majors. Prerequisites: Clothing and Textiles 120, 140, 170. (1Sp) Staff

197. Honors Studies. See Family Life

198. Honors Seminar. See Family Life

204. Economics of Clothing and Textiles. Study of current theories and research on consumer clothing-oriented behavior; factors affecting the production, distribution, and consumption of clothing and textile products; the role of the clothing and textile industries in the national economy. (3Sp) Staff

206. Consumer Problems in Clothing and Textiles. A study of the problems encountered by consumers in the purchase and care of clothing and textiles. Emphasis is placed on current developments in textile legislation and in labeling, fitting of ready-to-wear, and advances in textiles technology relative to product utilization. (3F) Staff

208. Cultural Bases of Clothing. Study of clothing as a communicative device with respect to technological advancement, societal values, and social role enactment. Analysis includes detailed consideration of the concepts of beauty, acculturation, symbolism, modesty, social stratification, and reference group theory applied to clothing-oriented behavior. Prerequisite: CT 206. (3Sp) Compton

210. Personality Projection Through Clothing. A developmental approach to the study of clothing. Emphasis is placed upon the inter-relationships among the self, the body, and clothing at each stage of the life cycle. Detailed consideration will be given to the processes of differentiation-integration, identification, self structure, self valuation, and self adjustment in relation to clothing-oriented behavior. Prerequisite: CT 206. (3Sp) Compton

220. Research and Thesis. Credit arranged. (F, W, Sp, Su) Staff

290. Independent Study. Credit arranged. (F, W, Sp, Su) Staff

291. Graduate Seminar. Open to graduate students. (2Sp) Staff

293. Research Methods. See Family Life

295. Research and Thesis. Credit arranged. (F, W, Sp, Su) Staff

*Taught 1965-66
**Taught 1966-67
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) Composite major in Child Development and Elementary Education
2) Child Development
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 parent or future parent.

Undergraduate Study

The 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:

Required: FCD 108, 174 and 175.
Electives: 18 hours selected from the following courses, to be approved by adviser. Family and Child Development 77, 115, 120, 125, 140, 150, 164, 185, 187; English 112; Education 116; Fine Arts-A 50 or 151, Fine Arts-M 150, or Fine Arts-Th 54, 56; Food and Nutrition 22; Physical Education 81, 84, 84, 111; Psychology 112, 123, 127, 135, 145, 161; Speech 118, 122, 167; Sociology 92, 160, 171, SW165, SW170; Zoology 102.

Child Development Major. The curriculum for a major in Child Development includes:

Required: Family and Child Development 108 (3), 174 and 175 (9). Electives: 18 hours selected from the following courses, to be approved by adviser. Family and Child Development 67, 68, 77, 100, 115, 120, 125, 140, 150, 164, 180, 185, 187; Clothing and Textiles 5, 106; English 122; Food and Nutrition 22; Fine Arts-A 50, 151; Fine Arts-M 150; Household Economics and Management 149, 155; Industrial Education 168; Physical Education 81, 83, 84; Psychology 112, 123, 135, 145; Sociology 90, 130, 156, 160, 171, 172; Zoology 102.

Child Development Minor. To minor in Child Development one should take Family and Child Development 67, 68, 108, 174, 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 the setting of a child development laboratory.

Marriage and Family Relations Major. The curriculum for a major
in Marriage and Family Relations includes: Family and Child Development 67 or 100, 120, 140, 150, 180, 187; Household Economics and Management 149, 155; Sociology 160 or Social Work 165; Psychology 112; Zoology 102; plus 9 hours selected from supporting courses in related fields.

**Marriage and Family Relations Minor.** The curriculum for a minor includes: Family and Child Development 67 or 100, 120, 140, 180, 187; Household Economics and Management 149, 155; Sociology 160 or Social Work 165; Psychology 112; Zoology 102; plus 9 hours selected from the other courses included in the Marriage and Family Relations 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. Majors in Marriage and Family Relations should take a teaching minor in some subject required to be taught in high school.

**Counseling Service.** The Department of Family and Child Development provides premarital, marriage, and family counseling for students as part of a university-wide counseling program under the direction of the Coordinator of Counseling Services. Application for counseling on such problems as mate selection, husband-wife relationships, and parent-child relationships may be made to the department, or to the Coordinator of Counseling Services.

**Graduate Study**

At the graduate level, programs are offered leading to the MS degree in either Child Development or Marriage and Family Relations. Individualization of emphasis may be provided by the selection of courses in such departments as Education, Psychology, and Sociology as well as the other departments in the College of Family Life.

**Family and Child Development Courses**

20. **Marriage and the American Family.** Marriage and family living in a dynamic society. Influence of social change on patterns of courtship, marriage and family living. (3F, W, Sp) Skidmore, Staff


68. **Preschool Laboratory.** Directed observation in the Child Development Laboratory. Recommended to parallel or follow FCD 67. (3F, W, Sp) Cahoon, Sims

77. **The Child from Six to Twelve.** Growth and development of the normal child from six to twelve years. Guidance principles implicit in the normal behavior of children at these age levels. Laboratory experience and observation. Prerequisite: FCD 67. (3F) Lewis

100. **Human Growth and Development.** Growth and development from birth to maturity. General behavior patterns characteristic of different levels of maturity; individual differences and needs. Prerequisites: Psychology 53 and FCD 67. (3F, W, Sp) Carter

108. **Guidance of the Young Child.** Review of development principles with emphasis on social and emotional growth; guidance philosophy, principles and techniques. Two lectures. Two hour lab weekly. Prerequisites: Family and Child Development 67, 68. (3F, W, Sp) Lewis, Sims

109. **Play-School Education.** Methods and materials for play-school in high school home economics programs. Laboratory experience in working with preschool children in play-school situations. Prerequisites: FCD 67 and 68. FCD 108 to be a prerequisite or parallel course. (2F, Sp) Lewis

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

120. **Marriage.** Engagement; marriage relationships; understanding of self. For men and women. (3F, W, Sp) 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. (3Sp) Skidmore

127. Family Life Workshop. Designed for teachers and leaders to study the needs of parent, teacher, and community 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. (3Sp) Skidmore


150. Seminar. Study of topics in current literature plus independent reading selected according to interest. (2Sp) Carter

164. Nursery School Planning and Administration. Development of the nursery school movement. Problems of physical plant, equipment, public relations, staff and budgeting of the child care center. (3Sp) Lewis


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 Family and Child Development 168 and 164. Arrangements must be made for practice teaching well in advance of registration. (6F, W, Sp, Su) Lambert

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

185. The Family in the Middle and Later Years. Family development, and problems of grown children and their parents; parents on their own; understanding older family members. (3Sp) 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) Staff

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


206. Seminar in Child Guidance. Study and analysis of theories and philosophies of central importance in defining the nature, process, and structure of child guidance. (3Su) Staff

235. Theory and Practice of Play Therapy. See Psychology 235. (3F) Hofmann

238. Practice in Play Therapy. See Psychology 238. (2Sp) Hofmann

251. Seminar in Family Relations. Analysis of selected topics in family relations. (2W) Carter

252. Seminar in Child Development. Analysis of selected topics dealing with growth, behavior, and development of the child. (2Sp) 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, Sp, Su) Lambert

278. Practicum in Agencies Serving Children. Experience in working in agencies serving children. Limited to advanced students who have completed Family and Child Development 174 and 175. Time and credit arranged. (F, W, Sp) Lambert

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

295. Research for Master's Thesis. Credit arranged. (F, W, Sp, Su) Staff
Department of

Food and Nutrition

Head: Professor Ethelwyn B. Wilcox
Office in Family Life 111

Professor Phyllis R. Snow; Associate Professor Flora Bardwell, Extension Specialist, Amy R. Kearsley, Associate Extension State 4-H Club Leader, Margaret Merkley, Extension Program Leader in Home Economics; Assistant Professor Elveda Smith; Instructors Georgia Lauritzen, Grace Smith.

Undergraduate

This Department offers three undergraduate programs leading to a Bachelor of Science degree in Food and Nutrition: Foods, Nutrition and Dietetics, and Research in Food and Nutrition. These programs are planned to meet the demands for professional staff in hospital dietetics, public health, and welfare organizations; food service in commercial and educational facilities; home economics in business; extension; and food marketing agencies. The Research major provides the basic science background required for advanced study in either foods or nutrition.

Students may select the program in which they are most interested. It is recommended that majors also take courses in other departments of the College of Family Life.

Food and Nutrition Minor

Students from all other colleges, as well as students from other departments of the College of Family Life, may select a minor in Food and Nutrition. A minimum of 18 hours is required.

Foods

The Foods program prepares the student for professional opportunities in food laboratories and equipment manufacturing companies; also for magazine and newspaper writing and in advertising and public relations provided an extended sequence of courses in communication arts is elected.

The following courses are required in addition to those listed under University requirements for all undergraduate programs:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 35</td>
<td>College Algebra</td>
<td>5</td>
</tr>
<tr>
<td>Math 46</td>
<td>Trigonometry</td>
<td>5</td>
</tr>
<tr>
<td>Chem 3</td>
<td>Chemical Principles and Qualitative Analysis</td>
<td>16</td>
</tr>
<tr>
<td>Chem 121</td>
<td>Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Hist 75</td>
<td>General Bacteriology</td>
<td>5</td>
</tr>
<tr>
<td>FN 22</td>
<td>Principles of Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>FN 23</td>
<td>Principles of Food Preparation</td>
<td>3</td>
</tr>
<tr>
<td>FN 25</td>
<td>Meal Management for the Family</td>
<td>3</td>
</tr>
<tr>
<td>FN 107</td>
<td>Science in Relation to Food</td>
<td>6</td>
</tr>
<tr>
<td>FN 108</td>
<td>Preparation</td>
<td></td>
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<tr>
<td>FN 109</td>
<td>Experimental Foods</td>
<td>3</td>
</tr>
<tr>
<td>FN 140</td>
<td>Nutrition</td>
<td>4</td>
</tr>
<tr>
<td>FN 146</td>
<td>Food Technology and Economics</td>
<td>3</td>
</tr>
<tr>
<td>FN 150</td>
<td>Seminar-Foods</td>
<td>1</td>
</tr>
<tr>
<td>FN 180</td>
<td>Quantity Food Preparation</td>
<td>5</td>
</tr>
</tbody>
</table>

Recommended electives to be selected after consultation with the adviser:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 122</td>
<td>Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Chem 180</td>
<td>Elementary Biochemistry</td>
<td>5</td>
</tr>
<tr>
<td>HEM 100</td>
<td>Equipment</td>
<td>3</td>
</tr>
<tr>
<td>HEM 149</td>
<td>Home Management</td>
<td>3</td>
</tr>
<tr>
<td>CT 5</td>
<td>Design in Everyday Living</td>
<td>3</td>
</tr>
<tr>
<td>An Hus 185</td>
<td>Meats</td>
<td>3</td>
</tr>
<tr>
<td>BA 100</td>
<td>Survey of Accounting Principles</td>
<td>4</td>
</tr>
<tr>
<td>BA 151</td>
<td>Marketing Principles</td>
<td>5</td>
</tr>
<tr>
<td>Econ 51</td>
<td>General Economics</td>
<td>5</td>
</tr>
</tbody>
</table>
Minors in Food Marketing and Economics, Journalism, Chemistry, or Physics are recommended for this major.

Nutrition and Dietetics

This program prepares the student for work in dietetics in a hospital, clinic, school lunch program, or large food service unit. Basic courses in foods, nutrition, chemistry, and physiology are required for the professional rank of dietitian. The following courses are required in addition to those listed under University requirements for all undergraduate programs:

Math 35 College Algebra 5
Math 46 Trigonometry 5
Chem 3, 4, 5 Chemical Principles and Qualitative Analysis 16
Chem 121 Organic Chemistry 5
Chem 180 Elementary Biochemistry 5
Bact 70 General Bacteriology 4
Bact 71 General Bacteriology Laboratory 2

Physiol 4 Human Physiology 5
Psych 53 Elementary General Psychology 5
Psych 102 Educational Psychology for Secondary Teachers 3
Psych 155 Psychology for Business and Industry 3

BA 100 Survey of Accounting Principles 4
FN 22 Principles of Nutrition 3
FN 23 Principles of Food Preparation 3
FN 26 Meal Management 5
FN 197, 198 Science in Relation to Food Preparation 6
FN 140 Nutrition 4
FN 145 Diet Therapy 5
FN 146 Food Technology and Econ 3
FN 150 Seminar-Nutrition 1
FN 180 Quantity Foods Preparation 5
FN 182 Institution Organizations Management and Cost Control 5

Recommended Electives:
FN 109 Experimental Foods 3
OT 5 Design in Everyday Living 3

Research in Food and Nutrition

The research program prepares for graduate work in the field of Food and Nutrition or for technical laboratory positions. Basic courses in foods, nutrition, chemistry, mathematics, physics, and physiology are required of all students in this specialization. Students electing this approach should take chemistry and mathematics their Freshman year. The following courses are required in addition to those listed under University requirements for all undergraduate programs:

Chem 3, 4 Chemical Principles and Qualitative Analysis 15
Chem 115 Quantitative Analysis 5
Chem 121 Organic Chemistry 10
Chem 180 Elementary Biochemistry 5
Bact 70, 71 General Bacteriology 6
Physio 4 Human Physiology 5
Math 35 College Algebra 5
Math 46 Trigonometry 5
FN 22 Principles of Nutrition 3
FN 23 Principles of Food Preparation 3
FN 107, 108 Science in Relation to Food Preparation 6

Recommended electives to be selected after consultation with the adviser include:
Food and Nutrition Courses

22. Principles of Nutrition. The relation of food to health; factors influencing nutritive requirements; problems applicable to individual interests and needs. (3F, W, Sp) Lauritzen

23. Principles of Food Preparation. The influence of such factors as kind and proportion of ingredients, manipulation, and method of cooking on nutritive value and acceptability of foods. One lecture and two laboratories. Prerequisite or parallel: Food and Nutrition 22. (3F, W, Sp) Lauritzen

25. Meal Management for the Family. Planning, preparing and serving family meals with consideration of the nutritional needs and time, energy, and money resources of the family. Prerequisite: Food and Nutrition 22, 23. (3F, W, Sp) G. Smith, Snow

90. Numbers and Units for Food Science. This course is designed to teach a variety of topics common to basic courses in food chemistry and nutrition: use of the metric system; use of units and dimensions in the labeling of physical quantities; molecular basis of heat and use of different scales of temperature; use of numbers expressed in exponent form; and use of slide rule. Laboratory experiments are designed to illustrate and emphasize the use of these concepts in food preparation and nutrition calculations. One lecture and one laboratory (2F) Wilcox

107. Science in Relation to Food Preparation. Scientific principles underlying modern food theory and practice. The relation to food preparation of the physical and chemical properties of proteins, starches, sugars, leavening agents, and pigments; the properties of true solutions and principles of crystallization; colloidal systems—gels, soaps, foams, and emulsions. Laboratory experiments designed to illustrate the effect of varying ingredients and preparation procedures on the quality of food products. Prerequisite: Organic Chemistry, FN 23. (3F, W) Staff

108. Science in Relation to Food Preparation. Continuation of FN 107. (3W, Sp) Staff

109. Experimental Foods. Objective tests in food research. Development, execution, written and oral interpretations of individual problems. Prerequisite: FN 108. (3Sp) Staff

140. Nutrition. Fundamental principles of human nutrition and their application to the individual and family group. Laboratory problems include a dietary study, animal experimentation, and certain chemical analyses. Three lectures and one laboratory. Prerequisites: FN 22, 23, Organic Chemistry, and Physics 4. (4F, Sp) G. Smith

145. Diet Therapy. Application of dietetic principles to health maintenance including dietary modifications necessary in pathological conditions, pregnancy, and childhood. Four lectures and one laboratory. Prerequisites: Food and Nutrition 140. (5Sp) Lauritzen

**146. Food Technology and Economics. Manufacture and preservation of food products and the influence of these products on physical, chemical, and nutritive value of foods; legal requirements and specifications; labeling; implications for the consumer in shopping for food. Prerequisite: FN 108. (3W) E. Smith

150. Seminar. Reports and discussion on current literature. Prerequisites: Chemistry 150; Food and Nutrition 108, 140. (1Sp) Staff

**180. Quantity Foods Preparation. Principles of food preparation applied to large quantity production; standardization of food quality; menu planning and study of production costs. The course is planned particularly for juniors and seniors majoring in dietetics and institutional management. Prerequisite: FN 108 and 140. (5W) Lauritzen

**182. Institutional Organization, Management and Cost Control. Principles of scientific management applied to large service units. Emphasis on organization of large food service units, on personnel management and human **Taught 1966-67
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. Prerequisite: FN 108 and 140. (5W)

Lauritzen

196. Independent Study. Credit arranged. (F, W, Sp, Su) Staff

197. Honors Studies. See Family Life 197. Credit arranged. (F, W, Sp, Su) Staff

198. Honors Seminar. See Family Life 198. (2W) Staff

201. Laboratory Methods in Nutrition. Nitrogen balance study; mineral, and vitamin determinations. Prerequisites: FN 140 and Biochemistry (2Sp) Wilcox

203. Nutrition Research; Micro-Chemical Analysis. Micro-chemical determinations of vitamin and other constituents in small amounts of blood. Prerequisites: Organic and Biochemistry. Taught as needed. E. Smith

207. Laboratory Methods in Foods Research. Application of the experimental method to advanced problems in food research. Prerequisite: FN 109, Organic Chemistry. Taught as needed. Staff

Human Nutrition. Metabolism of carbohydrates and minerals as applied to nutritional requirements and food supplies of people. Prerequisites: FN 140 and Biochemistry. (3F) G. Smith

231. Human Nutrition. Metabolism of lipids and proteins as applied to nutritional requirements and food supplies of people. Prerequisite FN 140 and Biochemistry. (3W) Wilcox

232. Human Nutrition. Metabolism of vitamins; critical analyses of methods used in assessing human nutrition status; evaluation of nutritional problems of current interest. Prerequisites: Food and Nutrition 140 and Biochemistry. (3Sp) E. Smith

233. Readings in Foods. A critical review of scientific literature in the field of foods. Prerequisite: Food and Nutrition 109. Taught as needed. Staff

243. Nutrition and Growth. Relation of nutrition to growth from the prenatal period to old age. Prerequisite: Food Nutrition 140. Taught as needed. E. Smith

270. Nutrition and Biochemistry Seminar. See Animal Husbandry 270. Staff

290. Independent Study. Credit arranged. (F, W, Sp, Su) Staff

291. Graduate Seminar. Reports and discussions on current literature. (1F, W, Sp) Staff

295. Research and Thesis. Credit arranged. (F, W, Sp, Su) Staff

Department of Homemaking Education

Head: Assistant Professor Virginia H. Harder
Office in Family Life 318

Homemaking Education provides professional training for teaching homemaking in the secondary schools. In addition it provides valuable experiences for personal and family living. A Bachelor of Science or a Bachelor of Arts may be earned in Homemaking Education. A Master of Science degree may be earned in Home Economics Education.

Undergraduate Study

Composite major for Secondary School Teaching. The composite major requirements include:

1) Subject matter areas: Clothing and Textiles 10, 24, 105, 106, 120 and 5 or FA-A 5; Family and Child Development 67, 68, 108, 109, 120, and one class selected from FCD 140, 150, 180, 185, 187, Psy 202, Soc 160, 171; Food and Nutrition 22, 23, 25, 107, 108, and 140; Household Economics and Management 65, 75, 100, 149, 150, or 151, 155; Family Health 152.

In addition to filling University group requirements students should keep in mind Homemaking Education prerequisites: Psychology 53 and Chemistry 10, 11, 12.

Students may gain depth in de-
partment areas by electing classes beyond the requirements.

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

2) State Certification: Thirty-three credits in professional education are needed to meet requirements for the General Secondary Certificate: Family and Child Development 100 or Psychology 100; Psychology 106, Public Health 155; Education 126 and 150; Homemaking Education 120, 121, 122, and 124.

3) Requirements for State Vocational Homemaking include those for Vocational Homemaking in Secondary Schools.

Services available to teachers are:

1. Guidance and help in meeting requirements for renewing certificates.
2. Opportunity to meet certification requirements.
3. Advanced study leading to the Master of Science degree in Homemaking Education.
4. In-service education.

Recommendation concerning competency in the Clothing and Textiles area. This is placed in the student's file for professional employment purposes.

Extension Service Curriculum. Courses required for entering the USU Extension Service as a County Home Agent are as outlined in the Homemaking Education Curriculum. Other recommended courses are: Extension Methods 151; Journalism 12 or 112; Speech 21; and Sociology 141. A three-month supervised training period in a county is advised for prospective Home Agents. Plans for this training are made with the Director of Extension Services.

Graduate Study

The Department offers two programs for the Master of Science degree. Plan I gives emphasis to general Home Economics subject matter and Plan II gives a major emphasis to the supervisory functions of homemaking teachers in the student teaching experience.

Plan I. This program is flexible to meet individual needs and is particularly applicable for extension specialists, those who need subject matter strength. The basic plan requires 45 credit hours and may be completed in any three quarters on campus within a five-year period. Included is research and thesis or Plan B reports.

Plan II. This program has been designed especially for those who wish to supervise the student teaching experience or take other home economics supervisory positions. The basic plan requires 45 credit hours and may be spread over 5 summers. Research and thesis or the Plan B reports may be conducted during the school year in on-going classroom situations. Evidence of a minimum of two years of successful teaching on the secondary level must be presented before the degree is granted.

See the Graduate Catalog for a more detailed accounting of the two plans.

Homemaking Education Courses

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. (6F, W) Staff

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

124. Curriculum Problems. Independent or group study of problems developed in terms of curriculum units for student teaching assignments and within the scope and sequence of the Utah State Curriculum Guide for Homemaking. (2F, W) Staff

190. Independent Study. Credit arranged. (F, W, Sp, Su) Staff

217. Current Developments in Homemaking Education. Newer developments in home economies education at the secondary level. Offered as needed. (3) Harder

237. Seminar. Opportunity for investigations and reporting on individual problems. Credit arranged. (F, W, Sp, Su) Staff

290. Independent Study. Credit arranged. (F, W, Sp, Su) Staff

295. Research for Master's Thesis. Credit arranged. (F, W, Sp, Su) Staff

Department of

Household Economics
and Management

Head: Associate Professor Edith Nyman
Office in Family Life 314

Associate Professor Rhea H. Gardner, Extension Specialist; Assistant Professors Lavina Harper, Virginia Lewis.

Courses in this Department help students to understand the theory of management and decision-making in terms of personal values and goals. The management theory is applied to specific aspects of management in the home: housing, family finance, and selection of household furnishings and household equipment. Course content gives meaning to the relationship between general economic conditions and economic problems of families.

A major in this Department contributes to professional preparation in Consumer Economics, Family Financial Counseling, Extension Service, Home Service and other Home Economics positions in business.

Household Economics and Management

MAJOR:
Housing HEM 65 .................... 3
Home Furnishings HEM 75 .......... 3
Household Equipment HEM 100 .... 3
Home Management HEM 149 ......... 3
Home Mgt House HEM 150 or Home Mgt Problems HEM 161 ................. 4
Family Finance HEM 155 ........... 3
Seminar HEM 160 .................................................. 3
Early Childhood FCD 67 ......................................... 3
Marriage FCD 120 .................................................. 3

Plus an additional 16 hours selected from the following:
General Physics Phy 6 ........................................... 4
General Chemistry 10, 11, 12 ................................. 15
Elements of Math Math 30 ...................................... 5
Demonstration Techniques HECED 123 .................... 2
General Economics Econ 51 .................................... 3
Economic Problems Econ 62 .................................... 3
Social Psychology Psy 161 ..................................... 3
The Family in Various Cultures Soc 160 .................... 3
Motion and Time Study TME 180 ............................. 3
Philosophy 45 ..................................................... 3
Beginning Logic Phil 50 ......................................... 3
Marketing Principles BA 161 .................................. 5
Principles of Advertising BA 166 ............................ 5
History of Economic Thought Econ 106 .................. 3
Accounting BA 100 ............................................... 4
Industrial Education 68 ........................................... 3

MINOR:
Housing HEM 65 .................................................. 3
Household Equipment HEM 100 ................................ 3
Home Management HEM 149 .................................. 3
Family Finance HEM 155 ....................................... 3

Plus an additional 6 credits in the Department or related supporting course work approved by the Department Head.

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

Graduate Study

The Department of Household Economics and Management offers work leading to the Master of Science degree, emphasizing the areas of Housing, Household Equipment, Home Management, or Family Finance. Flexibility in program planning provides opportunity for developing individual strengths and interests. Course work is arranged in cooperation with other departments of the University, including: Economics, Sociology, Psychology, Philosophy, Business Administration, Physics, Statistics, Chemistry, Family and Child Development, Food and Nutrition, and Clothing and Textiles. A Master's Degree prepares students for University teaching.

Household Economics and Management Courses

65. Housing. A consideration of factors involved in housing the family; financing, population increase, location, site planning and orientation; criteria for evaluating homes; housing trends; renting vs. buying and building vs. buying a used home; kitchen planning. (3F, W, Sp) Nyman

75. Home Furnishings. Characteristics of home furnishings in relation to their classification, design, respective quality, use and care. Local field trips. (3F, W, Sp) Lewis


149. Home Management. The theory of effective home management; concerns values and goals as reflected in decision-making about family resources. (3F, W, Sp) Nyman


151. Home Management Problems. Substitution for HEM 150 for married students only. The application of the theory of management as applied in students' homes. Prerequisites: Foods and Nutrition 22, 23, 25 or its equivalent; Household Economics and Management 149. (4F) Nyman

155. Family Finance. Consideration of major financial alternatives available to families and some factors that determine financial decisions. (5F, W, Sp) Nyman

160. Seminar. Reports and discussions on current readings in Household Economics and Management. (1Sp) Staff

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

260. Graduate Seminar. Review of current literature in Household Economics and Management. (1W) Staff

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

295. Research for Master’s Thesis. Credit arranged. (F, W, Sp, 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's degree with this combination major, students complete the Family Life and Secretarial courses here listed, plus the University group requirements listed in the Catalog.

Family Life Courses

42 hours with not less than 9 in any department.

CLOTHING AND TEXTILES

CT 10 Pattern Designing and Clothing Construction .......... 3
CT 24 Introduction to Textiles .......... 3
CT 106 Clothing Selection and Consumption ................. 2
CT 120 Comparative Construction Techniques ............... 5
CT 134 History of Textiles .......... 3
CT 136 History of Costume .......... 3
CT 140 Draping .......... 3
CT 170 Flat Pattern Designing .......... 3
CT 180 Tailoring .......... 3

FAMILY AND CHILD DEVELOPMENT

FCD 20 Preparation for Marriage and Family Relations .......... 3
FCD 120 Marriage .......... 3
FCD 67 Early Childhood .......... 3
FCD 68 Preschool Laboratory .......... 3
FCD 77 Child from 6-12 .......... 3
FCD 100 Human Growth and Development .......... 3
FCD 108 Guidance of the Young Child .......... 3
FCD 109 Play-School Education .......... 2
FCD 116 Growth of the Infant .......... 3
FCD 140 The Family in Its Social Setting .......... 3
FCD 150 Seminar .......... 2
FCD 185 Family in Middle and Later Years .......... 3

FOOD AND NUTRITION

FN 22 Principles of Nutrition .......... 3
FN 23 Laboratory of Nutrition and Food Preparation .......... 3
FN 25 Meal Preparation for the Family .......... 3
FN 107 Science in Relation to Food Preparation .......... 3
FN 108 Science in Relation to Food Preparation .......... 3
FN 109 Experimental Foods .......... 3
FN 138 Weight Control .......... 3
FN 140 Nutrition .......... 4
FN 146 Food Technology .......... 2
FN 150 Seminar .......... 1

HOUSEHOLD ECONOMICS AND MANAGEMENT

HEM 65 Housing .......... 3
HEM 75 Home Furnishings .......... 3
HEM 100 Household Equipment .......... 3
HEM 149 Home Management .......... 3
HEM 150 Home Management House .......... 4
or
HEM 151 Home Management Problems .......... 4
HEM 155 Family Finances .......... 3
HEM 160 Seminar .......... 1

Office Administration Courses

OA 42 Intermediate Type .......... 2
OA 43 Advanced Type .......... 2
OA 65 Records Administration .......... 3
OA 85 Office Data Systems .......... 3
OA 92 Business Machines .......... 2
OA 141 Dictation and Transcription I .......... 5
OA 142 Dictation and Transcription II .......... 5
OA 167 Office Practice .......... 2
OA 175 Office Management .......... 3
OA 186 Secretarial Procedures .......... 3
BA 1 Introduction to Accounting .......... 3
BA 4 Business Law .......... 2
BA 5 Business Law .......... 2
BA 20 Introduction to Business .......... 3
BA 143 Business Communications .......... 3

Total .......... 43 hours

It is recommended that BA 2 also be completed—3 hours.
College of

Forest, Range and
Wildlife Management

Department of Forest Management, 203
  Forest Recreation, 204
  Forest-Watershed Management, 205

Department of Range Management, 208
  General Range Management, 209
  Forest-Range Management, 209
  Watershed Management, 209

Department of Wildlife Resources, 212
  Game Management, 212
  Fishery Management, 213

Degrees Offered:
  Bachelor of Science
  Master of Forestry
  Master of Science
  Doctor of Philosophy
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 Management work as typified by the demand of public land management agencies, one in Forest Recreation, and one in Forest-Watershed Management. As a Range Management student you may specialize in general 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 Of-
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 Quarter fees, a $5 fee is charged for each of the four courses. Board is provided on a cost basis; lodging is without cost. Before attending camp one should be inoculated against Rocky Mountain spotted fever.

As a transfer to this College from another school a student should note that (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. 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) Fulfillment of the General Education requirement of the University. (4) Proficiency in written and spoken English. If deficient in English, a student is required to pass certain supplementary or corrective courses in addition to regular requirements. (5) At least one summer of department-approved practical and qualifying work experience. In certain instances Summer Camp attendance may fulfill this requirement. (6) Beginning with 1966 graduating class, Seniors in the College must have a grade
average in their professional course of 2.2. A deficiency in grade point may be remedied by taking additional professional courses or by repeating professional courses for which a low grade was received.

**Department of Forest Management**

**Head:** Professor J. Whitney Floyd
**Office in Forestry and Zoology 106**

Professors T. W. Daniel, Raymond R. Moore; Associate Professor S. Ross Tocher; Assistant Professors John D. Hunt, Walter H. Johnson, J. D. Schultz, J. Alan Wagar, Ross S. Whaley; Instructor Carl M. Johnson; Collaborators Norbert V. DeBylle, Robert S. Johnston, Richard G Krebill, Roger S. Peterson, Bland Z. Richardson.

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 Forest Management provides general training for a basic background in Forestry for the student who plans to go into administrative work on forest lands, or for basic training for Forestry research.

2. The second option, Forest Recreation, is designed to train a person for employment with the National Park Service, the U.S. Bureau of Outdoor Recreation, 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.

3. The third option, Forest-Watershed Management, is designed to provide a basic background in forestry with some selected courses in watershed management for the student who wishes to go into administrative work in forestry with an improved background for the understanding of watershed problems preparatory to pursuing a graduate program in watershed research.

A Forest Recreation Research Unit was established in the College of Forest, Range and Wildlife Management in 1962. This provides additional strength to the teaching and research program in Forest Recreation.

**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.
# 204 College of Forestry

## Required Basic Courses

In addition to the 14 Social Science and Humanities units listed below, a student must complete an additional 11 credits in the Social Sciences and Humanities, making a total of 25 credits, with at least 10 units in each field.

### Forest Management

#### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
<th>Quar taught &amp; Cr</th>
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<tbody>
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<td>English (BC) 1, 2, 3</td>
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<td>3 3 3</td>
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<tr>
<td>Chemistry 10, 11, 12</td>
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<td>5 5 5</td>
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<tr>
<td>Botany 24, 25, 30</td>
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<td>5 5 5</td>
</tr>
<tr>
<td>Forest Management 1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Range Management 1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Wildlife Management 1</td>
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<td>1</td>
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<tr>
<td>Gen Ed (Grp Req)</td>
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<tr>
<td>Physical Education (Activity or Military Science)</td>
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1Total: 16 18 15

#### SOPHOMORE YEAR

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<tr>
<td>Math 35, 44</td>
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<td>5 3</td>
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<td>Physics 6</td>
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<td>Geology 3</td>
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<tr>
<td>Agronomy 58</td>
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<td>Economics 51</td>
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<tr>
<td>Speech 105</td>
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Total: 16 19 17

#### Summer Camp

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<td>Forest Management 96</td>
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<td>Forest Management 97</td>
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<tr>
<td>Range Management 98</td>
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<td>Wildlife Resources 99</td>
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Total: 9

#### Options—Forest Management

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
<th>Quar taught &amp; Cr</th>
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<tr>
<td>Forestry 106</td>
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<td>Forestry 107</td>
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<td>Forestry 114</td>
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<td>Forestry 115</td>
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</tbody>
</table>

1Students not qualified (Successfully completed 1½ units of High School Algebra) for Math 35 should take necessary prerequisites (Math 30 or 34) which must be taken in the freshman year.

### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
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<tbody>
<tr>
<td>Forestry 119</td>
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<td>Forestry 126</td>
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<td>Range 126</td>
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<tr>
<td>English 24</td>
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<td>General Education</td>
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Total: 14 18 11

#### 13 Hours Restricted Electives

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<td>Forestry 125</td>
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<td>F</td>
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<tr>
<td>Forestry 129</td>
<td>(2)</td>
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<tr>
<td>Forestry 131</td>
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<td>Sp</td>
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<td>Forestry 141</td>
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<td>Sp</td>
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<td>Range 131</td>
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<td>Sp</td>
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<td>Bus Admin or Economics</td>
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<td>W</td>
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<tr>
<td>Statistics 51 or 131</td>
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### Forest Recreation

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
<th>Quar taught &amp; Cr</th>
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<tbody>
<tr>
<td>Forestry 106</td>
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<td>Forestry 115</td>
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<td>Forestry 118</td>
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<td>Forestry 130</td>
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<td>Forestry 138</td>
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<td>Range 126</td>
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<td>Range 180</td>
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<td>Landscape Arch 130</td>
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<td>Wildlife 160</td>
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</tbody>
</table>

Total: 16 14 12

1Students not qualified (Successfully completed 1½ units of High School Algebra) for Math 35 should take necessary prerequisites (Math 30 or 34) which must be taken in the freshman year.

### Notes

- Wildlife 160 may be substituted for Wildlife 150.
- Botany 140 and Entomology 105 may be substituted for Forestry 119.
- Forestry 119 may be substituted for Forestry 118.
- Wildlife 150 may be substituted for Wildlife 160.
### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
<th>Quar taught &amp; Cr</th>
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<tbody>
<tr>
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<tr>
<td><strong>Total</strong></td>
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#### 12 Hours Restricted Electives

Recreation students are required to take at least 12 quarter hours of courses selected from the following list. Social Science courses are particularly recommended.

- **Psychology 53** (5)
- **Psychology 161** (3) F,W,Sp
- **Sociology 70** (6) F,W,Sp
- **Sociology 90** (3) F
- **Sociology 140** (3) F
- **Poli Sci 124** (3) Sp
- **Poli Sci 151** (3) F
- **Economics 106** (3) F
- **Economics 171** (5) F,W,Sp
- **Forestry 107** (3) Sp
- **Forestry 126** (3) F
- **Forestry 126** (3) F
- **Wildlife 145** (3) W
- **App Stat 51 or 131** (4) F

**Total** 11 10 16

#### 15 Hours Restricted Electives

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<th>Course</th>
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<tr>
<td>Range 131</td>
<td>(4) F</td>
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<tr>
<td>Range 163</td>
<td>(3) W</td>
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<tr>
<td>Geology 115</td>
<td>(5) F</td>
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<tr>
<td>Geology 117</td>
<td>(4) W</td>
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<tr>
<td>Botany 121</td>
<td>(3) W</td>
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<tr>
<td>Agronomy 114</td>
<td>(6) Sp</td>
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<tr>
<td>Statistics 51 or 131</td>
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**Total** 17 7 15

### Forest Management

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>F W Sp</th>
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<tbody>
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<tr>
<td>Forestry 119</td>
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<tr>
<td>Forestry 150</td>
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<tr>
<td>Forestry 157</td>
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</tr>
<tr>
<td>Forestry 146</td>
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</tr>
<tr>
<td>Range 126</td>
<td>5</td>
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</tr>
<tr>
<td>Range 180</td>
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</tr>
<tr>
<td>1Wildlife 160</td>
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<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

1Wildlife 150 may be substituted for Wildlife 160.

### 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. 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 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 undergraduate 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


96. Forest Surveying. Practical field problems in surveying methods commonly employed in Forest, Range, and Wildlife Management. Lab Fee $5. (Summer camp 3 credits) Moore

97. Forest Practice. Field studies in inventories, successional stages, and growth of stands of trees. Study of forest soils and related land use. Lab fee $5. (Summer camp 4 credits) C. Johnson, Moore

103. Silviculture and Dendrology. Basic Silviculture: 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. (4W) C. Johnson

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. (3Sp) 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. (3Sp) Moore

110. Principles of Conservation. An introduction to conservation problems designed to acquaint one with the nature and extent of the renewable resources of the United States and the methods of conservatively using them. Open to all students except those registered in the College of Forest, Range, and Wildlife Management. (3F,Sp) C. Johnson

112. Dendrology I. Hardwoods. Identification, distribution and silvics of the more important forest trees in the United States. (3F) C. Johnson

113. Dendrology II. Conifers. Identification, distribution, and silvics of the more important forest trees of the United States. (2Sp) C. Johnson

114. Silviculture I. Characteristics of the tree species which influence silvicultural practice in the United States. Prerequisites: Summer Camp, Range 126, Forestry 112, Botany 120. (3W) Daniel

115. Silviculture II. Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: Forestry 114. (3Sp) Daniel

116. Seeding and Planting. Seed collection, extraction and cleaning methods; germination testing; storage of forest tree seeds; practical experience in field planting and nursery work. Prerequisite: Forestry 115. (2Sp) Daniel

118. Forest Protection I. Prevention, suppression and suppression of forest and range fires, including economic and physical effect; fire behavior. Field trips. (3W) C. Johnson

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

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 rota-
tion; compilation of data for management plans. Prerequisite: Forestry 107, 115. (4F)

122. Forest Valuation. Determination of monetary values in forest growing stock and land. Analysis of alternate management methods by use of standard valuation techniques. Prerequisite: Forestry 121. (4W)

123. Forest Economics. Economic problems involved in the utilization of forest land and timber, and in the distribution of forest products. Prerequisite: Forestry 122. (3Sp)

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)


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

130. Milling and Products. Manufacturing, grading, seasoning and preserving lumber, including study of the wood-using industries and their products. (3Sp) W. Johnson

131. Forest Products Marketing. Principles of marketing applied to lumber and other forest products. (3Sp) W. Johnson

132. Forest Administration and Policy. A study of forest administration, organization, policy formation and personnel management. The development of forest and conservation policy and its effects on current forestry practices. (3F)

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)

137. Recreational Use of Wildland. Consideration of the factors responsible for recreational use, legislative programs, philosophical concepts, and descriptions of recreation agencies involved in wildland recreation management. (3F)

138. Recreational Land Classification. Land classification and economics of various forms of forest recreational use. (2Sp)

139. Interpretive Planning. The analysis and development of interpretive programs for recreational areas. Techniques of natural history interpretation. Evaluation and planning of visitor information programs. (3W)

140. Forest Recreation Management. Factors influencing the management of forest recreation sites. Consideration of land management objectives, alternative methods of development, regulations, and user satisfaction. (3Sp)

141. Forest & Range Hydrology. The role of forest and range vegetation in determining the hydrologic function of a watershed; natural storage phenomena of the forest land surface and methods of modifying this. Prerequisites: Range 126, 180, For. 115. (4Sp)

145. Forest Problems. Individual study and research upon a selected forestry problem approved by the instructor. (1-3F, W, Sp)

146. Junior Field Problems. Study of forest operations. Junior year. Fee $40. (1Sp)

201. Forest Management Seminar. Review and discussion of current literature and developments in Forest Management. (1F)


203. Forest Recreation Seminar. Review and discussion of current literature and developments in Forest Recreation. (1Sp)

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)

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. (2F, W, Sp)

206. Forest Management. Individual study projects within the fields of forest measurements, valuation, regulation, organization, and development of forest properties. (2F, W, Sp)

207. Forest Protection. Advanced study in specialized fields of forest protection. (2W)

208. Forest Watershed Management. Individual study projects within the field of forest watershed management. (2F, W, Sp)

209. Forest Economics. Study of the interaction of markets on the demand for lumber and forest products. (2F)

210. Forest Recreation. Individual study projects within the field of forest recreation. (2F, W, Sp)


212. Forest Utilization. Individual study projects within the field of forest utilization. (2F, W, Sp)
Department of

Range Management

Head: Professor L. A. Stoddart
Office in Forestry and Zoology 161

Professors C. Wayne Cook, Karl G. Parker, Extension Specialist, Arthur D. Smith; Assistant Professors James E. Bowns, George B. Coltharp, J. B. Grumbles, Neil E. West; Collaborators Alvin T. Bleak, Dean Doell, P. E. Packer.

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 Courses

All students in the Department of Range Management must complete the coursework listed below during the Freshman and Sophomore years. In addition, University group requirements and coursework under one of the three options must be completed. These three fields of specialization include:

1. General Range Management under which the student is trained for management of range lands including public range administration and private ranch operation.
2. Forest-Range Management which trains the student for work in the U.S. Forest Service.
3. Watershed Management which involves training in wildland hydrology, soil conservation, and administration of watersheds.

In consultation with his major professor, the student is advised to secure approval of a complete study plan for his college career, including electives to meet his personal objectives. Certain substitutions may be made in required coursework to meet special education objectives upon approval of the department.

FRESHMAN YEAR

<table>
<thead>
<tr>
<th>Dept Course No—Course Name</th>
<th>F W Sp</th>
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<tbody>
<tr>
<td>Botany 24, 25, 30—Botany, Taxonomy</td>
<td>5 5 5</td>
</tr>
<tr>
<td>English 1, 2, 3—Basic Communications</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Mathematics 34, 35, 44—Algebra, Trigonometry</td>
<td>3 5 3</td>
</tr>
<tr>
<td>Forest Management 1—Survey and Orientation</td>
<td>2</td>
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</tbody>
</table>

1Students 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.
Range Management 1 — Elements of Range Management ............................ 1
Wildlife Management 1 — Elements of Wildlife Management .......................... 1
Animal Husbandry 2—Judging, Laboratory ............................................. 2
Physical Education—Physical Education .................................................. 1
Group Requirements .............................................................................. 3 5
Total ........................................................................................................ 16 17 17

SOPHOMORE YEAR
Chemistry 10, 11, 12—Chemistry ................................................................ 5 5 5
Agronomy 58—Forest and Range Soils ...................................................... 5
Economics 51—General Economics .......................................................... 5
Geology 3—Physical Geology .................................................................. 5
Physical Education—Physical Education .................................................. 1 1
Mathematics 97, 98, 99—Analytic Geom and Calculus ................................ 5 5 5
Group Requirements .............................................................................. 5 3 5
Zoology 4 Vertebrate Zoology .................................................................. 5
Total ........................................................................................................ 16 18 16

Required for Graduation in General Range Management Option

JUNIOR YEAR

Quar taught & Cr

<table>
<thead>
<tr>
<th>Dept Course No—Course Name</th>
<th>F W Sp</th>
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<tbody>
<tr>
<td>Physics 6—General Physics</td>
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<tr>
<td>Range Mgt 160—Prin of Managing</td>
<td>5</td>
</tr>
<tr>
<td>Range Lands ...........................</td>
<td>5</td>
</tr>
<tr>
<td>Range Mgt 161—Range Analysis Techniques</td>
<td>1</td>
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<tr>
<td>Range Mgt 126—Plant Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Botany 120—Plant Physiology</td>
<td>5</td>
</tr>
<tr>
<td>Range Mgt 131, 130, 132—Range Plant Communities</td>
<td>4 3 3</td>
</tr>
<tr>
<td>Range Mgt 163—Range Improvement</td>
<td>3</td>
</tr>
<tr>
<td>English 112—Advanced Expository Writing</td>
<td>3</td>
</tr>
<tr>
<td>Animal Husbandry 150, 151, 152—Animal Nutrition</td>
<td>3 3 3</td>
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<tr>
<td>Total ...................................</td>
<td>18 14 14</td>
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</table>

SENIOR YEAR

Wildlife 160—Animal Ecology ................................................................. 5
Range Mgt 180—Watershed Management .................................................... 4
Range Mgt 196—Field Problems .............................................................. 3
Range Mgt 193 or 194—Range Seminar ..................................................... 2or2
Animal Husbandry 110—Beef Cattle Production ......................................... 3
Animal Husbandry 125—Sheep Production ................................................ 3
Range Mgt 181—Range Economics ............................................................ 3
Range Mgt 164—Technical Prob in Range Mgt .......................................... 3
Botany 106—Agrostology ......................................................................... 4
Total ........................................................................................................ 14 13 5

Required for Graduation in Forest-Range Option

JUNIOR YEAR

Quar taught & Cr

<table>
<thead>
<tr>
<th>Dept Course No—Course Name</th>
<th>F W Sp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 6—General Physics</td>
<td>5</td>
</tr>
<tr>
<td>Range Mgt 160—Prin of Managing</td>
<td>5</td>
</tr>
<tr>
<td>Range Lands ...........................</td>
<td>5</td>
</tr>
<tr>
<td>Range Mgt 126—Plant Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Botany 120—Plant Physiology</td>
<td>5</td>
</tr>
<tr>
<td>Range Mgt 131, 130, 132—Range Plant Communities</td>
<td>4 3 3</td>
</tr>
<tr>
<td>Range Mgt 163—Range Improvement</td>
<td>3</td>
</tr>
<tr>
<td>English 112—Advanced Expository Writing</td>
<td>3</td>
</tr>
<tr>
<td>Forest Mgt 118—Forest Protection</td>
<td>3</td>
</tr>
<tr>
<td>Forest Mgt 130—Milling and Products</td>
<td>4</td>
</tr>
<tr>
<td>Total ...................................</td>
<td>17 14 12</td>
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</tbody>
</table>

SENIOR YEAR

Wildlife 160—Animal Ecology ................................................................. 5
Range Mgt 180—Watershed Management .................................................... 4
Range Mgt 196—Field Problems .............................................................. 3
Range Mgt 193 or 194—Range Seminar ..................................................... 2or2
Range Mgt 164—Technical Prob in Range Mgt .......................................... 3
Forest Mgt 106—Forest Measurements .................................................... 4
Forest Mgt 134—Aerial Photo Interpretation .......................................... 3
Forest Mgt 103—Silviculture and Dendrology ........................................ 4
Forest Mgt 104—Forest Mgt and Economics .......................................... 3
Total ........................................................................................................ 11 17 5

Required for Graduation in Watershed-Management Option

JUNIOR YEAR

<table>
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<tr>
<th>Dept Course No—Course Name</th>
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</tr>
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<tbody>
<tr>
<td>Forestry Summer Camp (9 credits) must precede Junior year.</td>
<td>9</td>
</tr>
<tr>
<td>Physics 6—General Physics</td>
<td>5</td>
</tr>
</tbody>
</table>
The following courses in Range Management are suggested for students who wish to minor in this field (requirements subject to approval by the Range Department): Range 126, Plant Ecology, 5 credits; Range 160, Principles of Managing Range Lands, 5 credits; Range 161, Range Analysis Techniques, 1 credit; Range 130, 131, 132, Range Plant Communities, 10 credits; Range 181, Range Economics, 3 credits.

Graduate Study

The degree of Master of Science in Range Management is granted upon completion of an arranged course of study. Adequate facilities are available to allow emphasis upon such related fields as Forestry, Soil Conservation, Animal Husbandry, Botany, Wildlife, Economics, or Soils. A Bachelor's degree in Range Management or a related subject is prerequisite to advanced study.

To a selected few students, a program of instruction and research leading to the degree of Doctor of Philosophy is also 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. 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 Summer Camp) Grumbles

126. Plant Ecology. Role of heredity and environment in plant behavior; plant succession, competition and indicators; analysis of habitat factors influencing plant growth and distribution. Prerequisites: Plant taxonomy and general soils. Lab fee $1. (6F, 6P) Stoddart

130. Grassland Communities. Composition, distribution, successional patterns, and management of grassland ranges. Prerequisite: Plant taxonomy and Range 131. Two lectures, one lab. (3W) Stoddart

131. Forest Range Communities. Composition, distribution, successional patterns, and management of forested ranges. Prerequisite: Plant taxonomy. Two lectures, two labs. (4F) Grumbles

132. Desert Plant Communities. Composition, distribution, successional patterns and management of desert ranges. Prerequisite: Plant taxonomy and Range 131. Lab fee $4. Two
lectures, one lab. Saturday field trips may be scheduled. (3Sp) West


161. Range Analysis Techniques. Theory, application and limitations of vegetation analysis methods and techniques. Field practice in vegetation sampling and range analysis. Credit not allowed those with credit in Range 98. Lab fee $3. Field trips to be arranged. (1F) Grumbles

162. Range Management. A terminal course for non-range majors dealing with management of native range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisite: summer camp or permission from instructor. (6Sp) Grumbles

163. Range Improvement. Methods and problems involved in seeding range lands, removing brush, improving stock watering facilities, and fencing ranges. Terracing, water spreading and use of dams on range lands. Prerequisite: Range 160 or 162. (3W) Parker

154. Technical Problems in Range Management. Specialized problems in range administration and management encountered by the technician. Prerequisite: Range 160 or 162. (3W) Stoddart

160. Watershed Management. Principles and methods involved in managing range and forest lands for optimum production and regulation of water yields and for maintaining soil stability. Three lectures, one lab. Lab fee $4. Saturday field trips may be scheduled. Prerequisite: Range 126. (4W) Coltharp

181. Range Economics. Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 160 or 162. (3F) Grumbles

193. Range Seminar. Supervised discussion and review of range animal literature. Prerequisite: Senior classification. (2W) Grumbles

194. Range Seminar. Supervised discussion and review of range plant literature. Prerequisite: Senior classification. (2Sp) West

195. Range Problems. Individual study and research upon a selected range problem. Prerequisite: Faculty approval. (1-3F, W, Sp, Su) Staff

196, 197. Range Field Problems. Field study of range management operations and research. Courses 196 and 197 are given alternate years. Lab fee $35. Prerequisite: Plant Ecology and Plant Communities. (3W) West


204. Land Use Seminar. Current problems and practices in wildland management with special emphasis on the western range. (2F) Smith

205. Seminar in Range Nutrition. Problems in management and research in the field of plant and animal nutrition on rangeland. Prerequisite: Animal Nutrition. (3W) Cook


207. Graduate Seminar. Review of current research in range management by graduate students and faculty. (1Sp) Coltharp


280. Watershed Analysis. Advanced study of principles, technical problems, and procedure encountered in watershed management. Prerequisite: Range 180. (2F) Coltharp

281. Advanced Range Economics. Advanced study of economic factors affecting land management practices with special consideration to range lands and range operations. Prerequisite: Range Economics. (2Sp) Smith

*Taught 1965-66
**Taught 1966-67
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 Game option prepares students particularly for management of wildlife; the Fisheries option for positions in fishery management, both freshwater and marine.

The Department participates in a Cooperative Wildlife Research Unit, a Cooperative Fishery Unit, and a program in wildlife extension.

Program of Studies

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

During the Freshman and Sophomore years a student should complete the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>English 1, 2, 3</td>
<td>9</td>
</tr>
<tr>
<td>College algebra and trigonometry</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry, including organic botany</td>
<td>15</td>
</tr>
<tr>
<td>Botany, including taxonomy</td>
<td>15</td>
</tr>
<tr>
<td>Zoology: invertebrate, vertebrate and entomology</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>Survey courses in forest, range, and wildlife management</td>
<td>4</td>
</tr>
<tr>
<td>MS, AS, or PE</td>
<td>3</td>
</tr>
<tr>
<td>Electives from associated departments are chosen with approval of the major professor. Recommended electives include: all courses in Wildlife, Range, or Forestry; Applied Statistics 131, 132, 141; Botany 112; Chemistry: organic, physical, or biochemistry; Civil Engineering 81, 173; Animal Husbandry 150; Geology 3; Photography 51; Physical Education 36; Physiology 4, 121, 122, 131; Zoology 101, 112, 116, 118, 119, 121, 122, 128, 129.</td>
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Required for Graduation of All Wildlife Students

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Wildlife 146, Principles of Wildlife Management</td>
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</tr>
<tr>
<td>Wildlife 157, 158, 159, Seminar (Senior Year)</td>
<td>3</td>
</tr>
<tr>
<td>Wildlife 160, Animal Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Range 126, Plant Ecology</td>
<td>5</td>
</tr>
<tr>
<td>Applied Statistics 51 or 131, Statistical Methods</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Writing, English 111, 112, 117, Journalism 112</td>
<td>6</td>
</tr>
<tr>
<td>Speech 105, Technical Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences and Humanities (including above required courses), 25 hours with at least 10 in each group. In addition to these courses, one of the following options may be chosen.</td>
<td></td>
</tr>
</tbody>
</table>

Option A. Game Management

Any two of the following three

Wildlife 146, Management of Upland Game...3
Wildlife Resources 213

Wildlife Resources Courses

1. Elements of Wildlife Management. Introduction to the problems and methods of wildlife management. (1Sp) 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 Furbearer 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. (4Sp) Stokes

150. General Wildlife Management. Principles of animal ecology and wildlife management; life histories, economics, and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife management majors. Five lectures; field trips arranged. (5F, Sp) Kelker

153. Management of Big Game. Life histories, distribution, numerical variation, enemies, and management activities for big game animals. Prerequisite: Wildlife 145 or 150. Three lectures, two labs, including field trips. (4W) 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. (3W) Kelker

156. 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, 1Sp) 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) Wagner

161. Limnology. A study of the physical, chemical and biological interactions in lakes

Option B. Fishery Management

Wildlife 151, Limnology 4
Wildlife 165, Fishery Management 3
Wildlife 169, Techniques of Fishery Management 5
Zoology 155, Ichthyology 3
Zoology 156, Ichthyology Lab 2

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 and the Utah Cooperative Fishery Unit provide 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 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 Head of the Department.
and other fresh waters. Prerequisite: Entomology 13. Three lectures, one lab. (4F)  
**Sigler**

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. (3Sp)  
**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. (3Sp)  
**Helm**

**Neuhold**

170. Wildlife Problems. Individual study and research upon a selected wildlife problem. (1 to 5F, W, Sp, Su)  
**Staff**

172. Problem Orientation. A discussion of the needs of an approach to wildlife investigations, presenting data, analyzing the problem, and drawing conclusions relative to research in wildlife management. (8W)  
**Kelker**

**Sigler**

210. Advanced Field Problems. Field training in techniques not covered in undergraduate courses. (1 to 5F, W, Sp)  
**Staff**

248. Animal Behavior. Cause, function and development of behavior among animals. Three lectures, one lab. (4F)  
**Stokes**

253. Advanced Big Game Management. Population dynamics, census methods, hunting regulations, and management plans. Prerequisite: Wildlife 158 or equivalent. Two lectures, one lab. (3W)  
**Wagner**

257. Graduate Seminar. Discussion of current investigation and management programs by class and staff members and by representatives of state and federal agencies. (1F, W, Sp)  
**Helm, Low, Neuhold**

**Wagner**

261. Advanced Limnology. Advanced study of factors affecting productivity of fresh water. Prerequisite: Wildlife 161 or equivalent. Two lectures, two labs. (4F)  
**Sigler**

262. Fish Population Theory. Study and discussion of the mathematical models which are in use in the field of fisheries. Four lectures, one discussion period. (6W)  
**Franklin**

270. Research and Thesis. Credit for field or laboratory research, library work, and thesis writing. (1 to 15F, W, Sp, Su)  
**Staff**
College of

Humanities and Arts

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Degrees Offered:
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  Bachelor of Fine Arts
  Bachelor of Science
  Master of Arts
  Master of Fine Arts
  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, Journalism), 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.

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. (6F, W, Sp, 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 6. 4 credits.

**Humanities (Languages, Arts)**

Liberal Studies

T. Y. Booth, Coordinator
Office in Main 132D

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 unwise may transfer to the Liberal Studies program upon receiving permission 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;

Two years of foreign language are also recommended as an option for satisfaction of the Languages and Arts, or Humanities, group requirements.

Social Science

History 4, 5, 6—History of Civilization.
Political Science 1—Government and the Individual.
History 13, 14—United States History.
fourteen credits in Philosophy¹; 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; and 30 hours in History, chiefly upper division, chosen in consultation with a member of the History faculty. (2) For the 15-credit requirement: History 4, 5, 20.

(C) Philosophy. Fourteen credits from the following: Philosophy 45, 50, 140, 141, 142, 160, 161; Political Science 145, 146, 147.

(D) Mathematics and Science. Complete one of the following series: (1) Biological science: Zoology 3 or Botany 24 or Bacteriology 10; Zoology 13 and 107; Public Health 50. (2) Chemistry: Chemistry 3-4-5 or 10-11-12. (3) Mathematics: Mathematics 35, 46, 97. (4) Physics: Physics 17-18-19, or 20-21-22. If students select the series in physics they should fill the exact science group requirement with Mathematics 35 and 46, and are advised to complete Mathematics 97 also.

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; 153-154-155, 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, or 134.

(B) Biological Sciences. Zoology 3, 4, 101, 107, 112, and 131; Botany 24, 25, 30, 118; Bacteriology 10, 160; Public Health 50, 155; Physiology 104. Students selecting this series 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, 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 de-

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

²Ten of these credits may be applied toward the group requirement in the field.
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.

**Department of**

**English and Journalism**

*(English, American Studies and Journalism)*

**Head: Professor King Hendricks**

**Office in Library 320**

**Professors** T. Y. Booth, Carlton F. Culmsee, Dean, College of Humanities and Arts, Moyle Q. Rice, Hubert W. Smith, J. Golden Taylor; **Associate Professors** John S. Bullen, A. H. Frietzsche, J. Lynn Mortensen, Veneta Nielsen, John M. Patrick, John J. Stewart; **Assistant Professors** Del Rae Christiansen, Z. B. Crockett, Kenneth B. Hunsaker, Cleon Kotter, Extension Information Specialist, Marlan D. Nelson, Dean O. Skabelund, Robert C. Steensma, Reed C. Stock; **Instructors** J. R. Allred, Kenneth Anderton, Patricia Gardner, Janet Harward, Thomas Lyon, Glenn Selander, Roberta L. Sorensen.

**English**

The English and Journalism program is designed to meet the ever-increasing demand for English-trained personnel in mass communications, in industrial writing and editing, in graduate schools, in public relations work, and in teaching. The need for teachers of English grows more critical each year at all levels.

There are four 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 General Journalism 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, 50, 60, 61.
(2) Early English (minimum five 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, 142, 147, 148, 149.
(6) Types (maximum twelve hours): 132, 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 advisor 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 Major. Students who do not intend to go beyond the Bachelor's degree in English, but who plan to teach at the secondary level, should complete the Standard English major except for the Language requirement and at the same time meet the requirements for teacher certification. Students who take this major will not qualify for entrance into graduate school.

The 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, 50, 58, 60, 61, 142, 147, 150, 151, 152, 153, 154, 155, 157, 158, 159.
(2) A minimum of sixteen hours in History, including 120 and 155. Additional History courses may be selected from other upper division American History courses.
(3) A minimum of eleven hours in Political Science, preferably 10, 101, 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. J. Golden Taylor to have his course approved.

Curriculum for Journalism Major

A program of study leading to a Bachelor of Arts or Bachelor of Science degree in Journalism is offered in the Department of English and Journalism. The program is designed to equip the student with an adequate set of professional values; to provide a broad background in
humanities and social sciences; and to provide adequate training in
skills and techniques that will prepare the student for a career in
journalistic work.

A student who majors in Journalism must complete 45 hours in
journalism courses, 37 of which are required, 8 electives.

Requirements for the News-Editorial Journalism major follow:
Journalism 12, 13, 14, 91, 106, 112, 113a, 114, 125, 126, 164, 199; Fine Arts-A 57 or 157; Political
Science 15.

Majors in Journalism must complete two advanced courses, selected
from those listed below, in any two of the following departments:
History: 128, 158, 159, 171.
Political Science: 101, 125, 127, 128, 140, 147, 170, 178.
Psychology: 140, 155, 161.

Two years of a foreign language are suggested for Journalism majors
but are not required. Journalism majors should consult Professor
Marlan Nelson, who has charge of Journalism, Main 132F.

Journalism Minor
Journalism 12
Journalism 13
plus 10 hours selected from
Journalism 14
Journalism 112
Journalism 164
Journalism 166
Journalism 184
Journalism 199

Graduate Study

Master of Art Degree. The candidate for a Master of Art 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 Grad­
uate Record Examination given by the School of Graduate Studies;
(2) pass the English Departmental Examination; (3) students sub­mitting a thesis will be expected to
perform acceptably in courses totaling at least 20 graduate (“200”) hours in addition to the hours credited to the thesis; these 20 hours must include at least 3 seminar classes. Students not submitting a thesis will be expected to perform acceptably in courses totaling at least 30 graduate (“200”) hours; these 30 hours must include at least 4 seminars. Exceptions will be
made only by action of the Committee; (4) present from the Lan­
guage Department, a statement of proficiency in reading of one
foreign language; (5) present an acceptable thesis; (6) pass successfully a test on 15 books recom­
recommended by the English Department; (7) pass successfully the
final oral examination under the auspices of the Graduate School.

Master of Art in American Studies. Candidates for the Mas­
ter’s degree in American Studies are required to present a Bachelor’s
degree with American Studies, English, History, or Political Sci­
ence as a major. The course of study will be arranged in consulta­
tion with any member of the American Studies committee and is sub­
ject to approval by the chairman of the committee, Dr. J. Golden
Taylor. 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 re­
requirements are in general the same
as those for the Master’s degree in
English. However, the depart­
mental 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 sat­
isfying requirements for the Mas­
ter’s degree in American Studies:
English 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 201, 252, and 253; History 143, 144, 152, 153, 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 30 must be in courses numbered above 200. 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.

English Courses

1, 2, 3. Basic Communications. Required of all freshmen. Designed to increase the skills of students in writing, reading, speaking, listening. (3F, 3W, 3Sp) Staff

4. Elements of Grammar. For students who wish training in grammar beyond that given in Basic Communications. (3F, W, Sp) Staff

5. Vocabulary. A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (3F, W, Sp) Staff

12 a, 12 b. Practice in Composition. For students who wish to practice in composition beyond that given in Basic Communications. (2F, W, Sp) Staff

14, 15, 16. English for Foreign Students. Required of all foreign students who fail to pass the English Entrance test. The courses are designed to assist the student in mastering the written and spoken forms of the English language. (3F, W, Sp) Staff

24. Introduction to Literature. Introduces the student to an understanding of the methods of the literary artist and the meaning of his work through the study of poetry, prose, and drama. Provides a foundation both for additional courses in literature and for individual reading. (3F, W, Sp) Staff

31. Floating Poetry. Poetry that has lived in oral tradition since medieval time. (3Sp) Hendricks

33. Readings in Short Story. (3F, W, Sp) Rice

34. Great Books and Ideas. Man’s ideas about himself, the universe, and the divine. (3F) Rice, Nielsen, Skabelund

35. Great Books and Ideas. Man’s ideas about social relationships. (3W) Rice, Nielsen, Skabelund

36. Great Books and Ideas. Man’s ideas about the modern world. (3Sp) Rice, Nielsen, Skabelund

(Courses 34, 35, 36 are related but they are taught as independent units and need not be taken as a series.)

37. Reading in the Novel. (3F, W, Sp) Bullen

40. World Literature Before 1650. (5F, W, Sp) Nielsen

41. World Literature from 1660 to the Present. (5F, W, Sp) Nielsen

42. Readings in Mythology. (3Sp) Stock

48. Modern European Literature. (3F) Staff

53. American Literature, Early Period (5F, W, Sp) Smith, Taylor, Hunsaker

54. American Literature, Late Period. (5F, W, Sp) Smith, Taylor, Hunsaker

58. Modern American Literature. (3W) Hunsaker

60. English Literature, Early Period. (5F, W, Sp) Staff

61. English Literature, Late Period. (5F, W, Sp) Staff

68. Modern English Literature. (3Sp) Bullen

104. Grammar. Designed for teachers. (3Sp) Mortensen

111. Technical Writing. Effective communication of ideas via the technical report and the scientific article. For junior and senior students of forestry and the natural sciences. Others admitted only with consent of instructor. (Needs of students majoring in arts, letters, education, business, or the social sciences are met by English 112. Students of engineering are directed to English 113.) (3F, W, Sp) Staff

112. Advanced Expository Writing. Concerned with theory, examples, and practice of general expository writing. Emphasizes organization, paragraph development, diction, and revision. Open to all upper division students, and others by permission of instructor. (3F, W, Sp) Staff

113. Engineering Reporting. Instruction in style, forms, and techniques of engineering reporting. Open only to students registered in College of Engineering. (Students majoring in physical sciences may be admitted with
consent of instructor. Students in other majors are not admitted.) (9F, W, Sp)

117. Creative Writing
   (a) Short Stories. (3Sp)
   Rice
   (b) Essays. (3F)
   Rice, Culmsee
   (c) Poetry. (3W)
   Nielsen

122. Children's Literature. Prose and poetry of children to the junior high school age. (3F, W)

134. Comparative Literature. The Romantic Period in England and Germany. (3F)

140. Greek Literature. An introduction to the major poets, dramatists, historians, and philosophers of Greece from Homer to Aristotle. All readings in English translations. (6F)

146. Comparative Literature. The Eighteenth Century in France and England. (3W)

150. American Fiction. Nineteenth and early Twentieth Century fiction writers. (3W)

151. American Fiction. Nineteenth and early Twentieth Century fiction writers. (3W)

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. (2)

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. (3W)


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. (3F)

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)

159. Critical Studies of Individual American Authors. Each course is an intensive study of the major works of one author with special concern given to matters of text, bibliography, and significant critical writings about the author's work. Open only to upper division and graduate English majors and to others by consent of the instructor. (a) Emerson, (b) Hawthorne, (c) Melville, (d) James. (2)

162. Chaucer. (5F)

163. Shakespeare. Comedies and History Plays. (5W)

164. Shakespeare. The Tragedies. (5Sp)

165. Readings in Individual English Authors. No prerequisite. (a) Wordsworth, (b) Byron, (c) Shelley, (d) Tennyson, (e) Browning, (f) Hardy. (2)

166. Middle English Literature in Translation. A study of English literature from the 12th century to the Renaissance. (3Sp)

167. Critical Studies of Individual English Authors. Each course is an intensive study of the major works of one author with special concern given to matters of text, bibliography,
and significant critical writings about the author's work. Open only to upper-division and graduate English majors and to others by consent of the instructor. (a) Donne, (b) Dryden, (c) Swift, (d) Arnold. (2) Staff

168. Readings in World Drama. Aeschylus to Ibsen. (5W) Booth

169. Readings in World Drama. Ibsen to the present. (5Sp) Booth

170. Milton. (3W) Rice, Stock

175. Literature of the English Renaissance. (5F) Frieszche

180. Restoration and Eighteenth Century. (5Sp) Steensma

190. The Romantic Period. (5F) Patrick

191. The Victorian Period. (5W) Frieszche

199. Readings and Conference. Credit arranged. Any quarter. Students must have the approval of the Head of the department. (3F, W, Sp) Staff

200. Thesis. Credit arranged. (F, W, Sp) Staff

201. Bibliography and Methods. Required of all candidates for the Master's degree in English. (3F, Sp) Bullen

202. A, B, C. Problems in Teaching Freshman English. A course designed to help the graduate assistants meet the actual classroom problems in Basic Communications. Required of all teaching assistants. (1F, 1W, 1Sp) Staff

205. History of the English Language. (3Sp) Hendricks

209. 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, Sp) Frieszche

234. Seminar in Modern Criticism. (3) Patrick

251. Seminar: Early American Literature. (a) The Puritan Mind, b) The Impact of Deism, (c) Democracy and Religious Diversity. (3) Staff

252. Seminar: 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) Marliowe and Jonson. (3) Staff

275. Seminar in English Literature 1580-1685. (3) Frieszche

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280. Seminar in Eighteenth Century Literature. (3) Steensma

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, Sp) Staff

Journalism Courses

1. 2. 3. College Journalism. For members of Student Life Staff. Discussion of newspapers and responsibilities of journalism. May be repeated once for credit. (Student Life editors may register for English 199). (1F, 1W, 1Sp) Nelson

10. Critical Analysis of the Newspaper. Study of significant current news practices and their relation to society. Emphasis upon examination of techniques used by editorial writers and columnists; attention given to methods of news analysis and comment. (2Sp) Nelson

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) Nelson

13. Reporting. Continuation of 12 with emphasis on newspaper style, social responsibilities, and problems of reporting. Practical experience writing for newspapers. (5W) Nelson

14. Editing and Copy Reading. An introduction to news editing and copy reading. Basic elements of newspaper style; newspaper usage, improvement of news presentation. Lecture and laboratory work. (3Sp) Staff

84. Writing for Radio. Taken concurrently with Speech 83. (3Sp) Stewart

91. Weekly Newspaper. Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly. (3W) Nelson

92. Weekly Newspaper Internship. Six or more week's work in the summer on a weekly newspaper. Prerequisite: Journalism 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 mass media. (5Sp) Stewart

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. Prerequisite: Journalism 13, 14. (3W) Staff

113a. Reporting Public Affairs. Coverage of local, state, federal courts; municipal, state and federal government administration
in the local community. Laboratory work included. Prerequisite: Journalism 14. (Offered alternate years beginning 1964-65). (3W)

Nelson 113b. Reporting Sports. Techniques and principles of reporting and writing sports; attention also given to sports coverage by other media. (3W) (Offered alternate years beginning 1964-65.)

Nelson 114. Advanced Copyediting. Continuation of Journalism 14. Study of advanced principles of editing, makeup and editorial policies involved in the editing process. Laboratory work included. (8F)

Nelson 125. Editorial Responsibility. Editorials and other elements of the modern editorial page, writing of editorials; essentials of press law and ethics. (3F)

Nelson 126. Law of the Press. Introduction to law of the press; attention given to basic principles of the law of libel, privacy, copyright, press freedom and responsibility as they specifically apply to the news media. (2W)

Nelson 164. Publicity Methods. Media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: Journalism 13, 14 or permission of instructor. (3S)

Allred 166. Journalism Practices. Laboratory work in publications, radio, or television. (2F, 2W, 2Sp)

Staff 184. TV Writing. Writing and editing news, drama and other television material. To be studied concurrently with Speech 181. (3F)

Barnes 185, 186, 187. Special Problems in Journalism. (1 to 2F, 1 to 2W, 1 to 2Sp)

Nelson 191. School Publications. For the prospective teacher. Problems of advising staffs of school newspapers, yearbooks, and magazines. (3Sp)

Nelson 199. Senior Seminar. Investigation of current problems in Journalism; introduction to elementary research methods in Journalism; study of selected group of books on journalism taken from the “Essential List of Readings” compiled by Frank Luther Mott. Prerequisite: Senior standing. Required of all Journalism Seniors. (2Sp)

(Please consult departmental office for dates, times, and instructors.)

Department of

Landscape Architecture
and Environmental Planning

Head: Professor Burton Taylor
Office in Main 1

Professor LaVal S. Morris, Emeritus; Assistant Professor Jon Anderson; Instructors G. L. Baron, Donald Ensign, Fred Von Niederhausern; Visiting Critics Burtch Beall, AIA, Owen Burnham, AIP, Leon Frehner, ASLA, Karsten Hansen, ASLA, Morris Johnson, ASLA, John O. Simonds, ASLA.

Landscape Architecture and Environmental Planning is concerned with the performance of arranging land and the objects upon it for human utilization. The curriculum is arranged so as to provide the student with a broad but well-disciplined background, so that upon graduating, he may perform in numerous capacities including land planning, recreation, industrial, and facilities planning; site selection, as well as in the traditional aspects of landscape architecture. Emphasis is placed on creating for man an environment commensurate with his needs. Class projects range from residential planning problems through institutional and complete community, recreational, and ecological development plans.
Bachelor’s 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 in related fields such as civil engineering, visual arts, physical sciences, and communications; (3) courses required for a liberal education. The student may take a Bachelor of Fine Arts or a Bachelor of Arts degree or a Bachelor of Science degree by adjusting his curriculum to fulfill the specific requirements for each type of degree.

Candidacy. In order to become a candidate for entrance to upper division and graduation in LAEP, a student must have successfully completed all lower division courses (LA 3, 20, 30, 35, 40, 41, 42, 60, 61, 62).

Minoring Degree. Students majoring in other departments can obtain a minor in Landscape Architecture by successfully completing with a B or better LA 35, 60, 61, 62, 140, 141, 142 or in special cases arranging with the department to take LA 190, special problems, which would be adapted to the specific student’s needs.

### FRESHMAN YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Elem of Land Planning, LA 3</td>
<td>3</td>
</tr>
<tr>
<td>Graphics, LA 20</td>
<td>3</td>
</tr>
<tr>
<td>Theory of Design, LA 35</td>
<td>3</td>
</tr>
<tr>
<td>History and Lit of LA, LA 30</td>
<td>5</td>
</tr>
<tr>
<td>Algebra, Math 34, 35</td>
<td>8</td>
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<tr>
<td>Trigonometry, Math 46</td>
<td>5</td>
</tr>
<tr>
<td>General Botany, Botany 24, 30</td>
<td>10</td>
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<tr>
<td>English 1, 2, 3</td>
<td>9</td>
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<tr>
<td>Descriptive Geometry</td>
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### SOPHOMORE YEAR

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Plant Materials, LA 40, 41, 42</td>
<td>9</td>
</tr>
<tr>
<td>Architectural Design 60, 61, 62</td>
<td>9</td>
</tr>
<tr>
<td>Physical Science 31, 32, 33</td>
<td>9</td>
</tr>
<tr>
<td>Plane Surveying, CE 81, 80</td>
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Visual Arts, 5, 6, 85 ........................................ 9
Sociology 70 .................................................. 5
Soils, Agronomy 56 .............................. 4

### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Course</td>
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<tr>
<td>Design LA 140, 141, 142</td>
<td>9</td>
</tr>
<tr>
<td>Planting Design, LA 150, 151, 152</td>
<td>9</td>
</tr>
<tr>
<td>City and Regional Planning 170</td>
<td>3</td>
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<tr>
<td>Fundamentals of Speech, Sp 1</td>
<td>5</td>
</tr>
<tr>
<td>Arts 14, 111, 181</td>
<td>9</td>
</tr>
<tr>
<td>English Composition</td>
<td>4</td>
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<tr>
<td>Economics 51, or Ag Econ 53</td>
<td>5</td>
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<tr>
<td>Cost Est, CE 130</td>
<td>6</td>
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<tr>
<td>Electives</td>
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### SENIOR YEAR

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<th>Course</th>
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<tbody>
<tr>
<td>Course</td>
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<tr>
<td>Constr, LA 160, 161, 162</td>
<td>9</td>
</tr>
<tr>
<td>Advanced Planning and Design, LA 180, 181, 182</td>
<td>12</td>
</tr>
<tr>
<td>Architectural Rendering 185</td>
<td>3</td>
</tr>
<tr>
<td>Rec Planning 130</td>
<td>3</td>
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<tr>
<td>Seminar, LA 195</td>
<td>1</td>
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<tr>
<td>Writing Feature Articles, Journalism</td>
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<tr>
<td>112</td>
<td>3</td>
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<tr>
<td>Roads and Pavements, CE 120</td>
<td>4</td>
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<tr>
<td>Technical Writing, English 111</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>11</td>
</tr>
</tbody>
</table>

Students interested in City Planning may take additional courses in Political Science, Sociology, and Economics. Consult with staff.

### Graduate Study

**Master’s Degree.** A Master’s Degree, MA, MS, MFA, will be given to students who successfully meet the requirements established by the curriculum committee. Special problems in the LAEP 200 series will be assigned to students on an individual basis.

Landscape Architecture and Environmental Planning Courses

3. Elements of Land Planning and Design. Relation of people to land regions and smaller areas. Principles of design and composition applied to various types of land planning. Planning the home environment and its relationship to the community is emphasized. (3F, W, Sp) **Staff**

20. Graphics. Methods of utilizing various graphic techniques for design presentation. Including perspective, light and shade studies,
lettering, and symbolic graphics necessary for professional practice. (3F, W) Taylor

30. History and Literature of Landscape Architecture. The history of physical plans as related to the community and its components. Design and planning in relation to land utilization during the past 5,000 years is studied. Emphasis on human dynamics with implications for the future. (5W) Staff

35. Theory of Design. Form and spatial relationships analyzed, defined, and applied in relation to vertical mass and horizontal. Abstract design is studied and the resultant forms transposed into spatial and mass relationships. The chief purpose is to provide the students with an awareness of design as early as possible in his training. (3Sp) Staff

40, 41, 42. Plant Materials. The ecological, functional and aesthetic uses of native and cultivated wood and herbaceous plants for use on the land. (3F, 3W, 3Sp) Ensign

60, 61, 62. Architectural Design. The design, construction, and orientation of structures as related to land areas and architectural functions. Prerequisites: LA 20, 35. (3F, 3W, 3Sp) Von Niederhausern

100. Professional Experience. Prior to graduation all landscape architectural students must have completed three months experience in landscape architectural or planning position with a government or private organization. Evidence of work done and an oral or written report at the discretion of the department are required. No credit. (Su) Staff

130. Park and Recreational Planning. Analysis and development procedures in national, state and urban parks, forest lands, and private lands in terms of recreational and aesthetic values and uses. (3Sp) 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 once during their training. Credit arranged. (Su) Staff

140, 141, 142. Landscape Design. Introduction to the analysis and writing of design criteria and the design procedure for private and public land planning projects. Theoretical and actual site problems are used. Prerequisites: LA 62 and CE 82. (3F, W, Sp) Ensign

150, 151, 152. Planting Design. Pictorial compositions and planting plans developed together. Designed to develop ability in visualizing the completed landscape development. (3F, W, Sp) Ensign

160, 161, 162. Landscape Construction. Master construction plans, grading, drainage, structure, cost estimates, and specifications. (3F, W, Sp) Baron

170. City and Regional Planning. An introduction to the procedures and methods of city and regional planning. Legislative, administrative, and effectuation of the general comprehensive plan. The physical design aspects of town and city are analyzed. (3W) Taylor

180, 181, 182. Advanced Planning and Design. Urban design, subdivisions, housing projects, public grounds, parks, cemeteries, building groups, recreational areas, and communities on various types of topography. (4F, W, Sp) Taylor

190. Special Problems. Selected problems to meet individual needs in completing the professional training. Registration by permission only. Credit arranged. (F, W, Sp) Staff

195. Seminar. Readings and reports on current topics and trends in Landscape Architecture and Environmental Planning. Required of senior students. (1W) Staff

210, 211, 212. Advanced Problems in Design and Planning. Problems or program are outlined in a collaborative effort with the staff and candidates for the Master's degree. Credit to be arranged. (F, W, Sp) Taylor

220. Thesis. Subject matter of Thesis will be determined by the student in consultation with the staff. The actual accomplishment of the Thesis will be a matter of making plans and supplementary drawings necessary for the actual accomplishment of a major problem in Land Design and Development. Written material will be required in the form of a statement of the problem; a basis of design consisting of justification, specification and any other supplementary material required. Staff
Department of

Languages

Head: Professor Austin E. Fife
Office in Main 210

Professors Thelma Fogelberg, Ira N. Hayward, Emeritus, George A. Meyer, Emeritus; Associate Professors L. Grant Reese, Kristina Trendota; Assistant Professors John M. Beyers, Gordon E. Porter, Alice Marian Robertson; Lecturers Yvette Kepinski, Vera M. Spoerry, Valentine Suprunowicz; Instructors Anne S. Johnson, Ruth Lehenbauer; Assistants Wilfredo Figueroa, Klara Ingold.

Courses are offered leading to the Bachelor's degree with a major in French, German or Spanish. Each of these major programs is specialized further to provide either for admission to graduate school or certification for high school teaching.

Language Major

(A) Candidacy. To become a candidate for a major in a modern language the student must have completed two years of lower division work in the language of his choice or the equivalent thereof through high school study or foreign residence. Proficiency tests (see following) will be used as deemed necessary by the Department of Languages to establish this equivalence.

(B) Major. 34 upper division credits in either French, German, or Spanish plus Language 100, distributed as follows:

Language 100 (required of all majors) advanced composition, conversation or linguistics. Literature courses. Other upper division courses in the language of the major.

Candidates for a secondary teaching credential must take French 113, German 112 or Spanish 112. They must also take Language 101, Laboratory Practice, for two of the seven credits listed above under "other upper division courses." They must also complete thirty hours of courses in professional education including the following specific courses: Psychology 100 and 102, Public Health 154 or 155 and Education 127, 129 and 130.

(C) Related Fields (45 Units). 1. One year in a second modern language, Latin or Greek.
2. Groups:
   Either 15 units each in two of the three areas listed below or 10 units in each; specific courses to be approved by the candidate's faculty adviser.
   a. Literature courses in English or in a language other than the major, Philosophy.
   b. History, Sociology, Economics, Political Science or Anthropology.
   c. Fine Arts: speech, theatre arts, art, music, landscape architecture.

(D) The Minor. 1. Students majoring in a modern language will be considered to have completed their minor requirements on completion of C, above. However, under certain conditions to be ascertained by the adviser, waiver of all or part of these requirements may be granted in favor of a minor in another area.

   2. For a teaching minor in a foreign language with the recom
mendation of the Department of Languages a student must complete 15 units of approved upper division work in one language: 24 units in a single language constitute a non-recommended minor for certification in the state of Utah.

Foreign Language Proficiency Tests

In September and in May proficiency tests will be administered to USU students who wish either to continue foreign language study begun in high school or to receive credit by examination for skills acquired through foreign travel or study. All entering students who have one or more years of study of a foreign language in senior high school and who wish to continue the study of that language at USU must take these tests. Tests will be given only in languages which are offered regularly at USU.

Language Laboratory

Laboratory listening sessions are required for all lower division language classes and for some upper division classes: a fee of $2.00 per quarter is charged for this service.

Summer Quarter Programs

For five successive years USU has conducted a National Defense Education Act Institute for teachers of French and Spanish. In the summer of 1965 we shall hold a Spanish Institute at Oaxaca, Mexico.

Steps have also been taken to offer the equivalent of a full year in a beginning language in the two summer sessions, making it possible, thus, for successful students to enter intermediate language courses in the fall of the same year. (Consult the USU Summer Quarter catalog for specific offerings.)

Spring Quarter at The University of the Americas

USU offers properly qualified students the opportunity to spend Spring quarter in residence at the University of the Americas. To qualify, students will normally be enrolled in 2nd-year college Spanish and be recommended for this program by their advisers. It should be particularly attractive to students interested in Spanish, Sociology-Anthropology, Fine Arts, Political Science, International Relations or History.

The University of the Americas courses approved under this program by the Department of Languages are listed below:


For a description of these courses see catalog of The University of the Americas. A list of other courses approved under this program is available on request.

French

Lower Division

1, 2, 3. Elementary French. (6F, 5W, 6Sp) Staff

4, 5, 6. Intermediate French. Aural-oral approach with knowledge of structure development through pattern drills, conversation and composition. Prerequisite: French 3 or equivalent. (3F, 3W, 3Sp) Staff

4a, 5a, 6a. Intermediate French Readings. Cultural and Literary readings with appropriate conversational drills and composition. Prerequisite: French 3 or equivalent. (2F, 2W, 2Sp) Staff

Upper Division

103. Readings in Prose Fiction. Reading and discussion of significant novels and short
104. Advanced Grammar and Composition. (SF) foegelberg
111. Readings in the Theatre. Reading and discussion of selected modern plays designed to develop vocabulary and rapid reading skills. Prerequisite: French 6 or 6a. (2W) robertson
114. Readings in Biography, Criticism, and Poetry. Reading and discussion of modern biographical, critical or poetic works designed to prepare the student for more advanced literature courses. Prerequisite: French 6 or 6a. (2Sp) robertson

*118. Contemporary French Civilization. Lectures and discussion in French of the culture of France in this century. Social, political, economic and religious life and institutions. Literature, the arts, science and technology. The role of France in the modern world. prerequisite: French 6 or 6a. (3W) staff

**132. French Literature, 1850-1900. Realism, naturalism, the Parnassians and symbolism. Readings, lectures and discussion of representative novelists, dramatists, poets and critics. Prerequisite: French 103, 111 or 114. (3W) fiefe

133. Romanticism in France. Chateaubriand, Hugo, Vigny, Musset, Lamartine. Prerequisite: French 103, 111 or 114. (2Sp) staff

*134. 18th Century Philosophers and Moralists. Montesquieu, Voltaire, Diderot, Rousseau, Bernardin de Saint-Pierre, Prevost. Prerequisite: French 103, 111 or 114. (2W) fiefe

**135. The 18th Century Theatre. Comedies of Beaumarchais and Marivaux. Prerequisite: French 103, 111 or 114. (3F) robertson

*139. The Comedies of Moliere. Prerequisite: French 103, 111 or 114. (3W) fiefe

*140. The Classical Tragedy: Corneille. Prerequisite: French 103, 111 or 114. (2Sp) robertson

*141. Philosophers, Moralists and Critics of the Classical Age. Descartes, Pascal, Boileau, La Fontaine. Prerequisite: French 103, 111 or 114. (2Sp) fiefe

*142. French Literature of the 16th Century. Humanism and the Reformation. The Pléiade, Rabelais, Montaigne and Ronsard. Prerequisite: French 103, 111 or 114. (2W) fiefe

*143. French Literature in the Middle Ages. Lyric, epic and didactic literature; the theatre and romances; introduction to Old French. Prerequisite: French 103, 111 or 114. (2Sp)

**144. The Classical Tragedy: Racine. Prerequisite: French 103, 111 or 114. (2F) fiefe

**150. French Literature of the 19th Century. Readings, lectures and discussion of representative novelists, dramatists, poets and critics. Prerequisite: French 103, 111 or 114. (3Sp) fiefe

196, 197, 198. Intensive Basic French. A beginning course designed to give advanced degree candidates minimal reading skills. Prerequisite: Graduate standing or previous mastery of a related second language. (3F, 3W, 3Sp) staff

199. Readings and Conference. Readings in scientific, technical or literary French. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, Sp) staff

German

Lower Division

1, 2, 3. Elementary German. Progressive and intensive development of the basic language skills: listening comprehension, speaking, reading and writing. Maximum emphasis on audio-lingual pattern drills and exercises in the classroom and language laboratory. (SF, 5W, 6Sp) staff

4, 5, 6. Intermediate German. Intensive review of grammar. Cultural and literary readings. Prerequisite: German 3 or two years of high school German. (3F, 3W, 3Sp) staff

4a, 5a, 6a. Second-Year Conversation. Accompanies German 4, 5, and 6. Required of German majors; recommended for all students in second-year German. Prerequisite: same as for Intermediate German. (2F, 2W, 2Sp) staff

4s, 5s, 6s. Scientific German. Intensive review of grammar. An introduction to the reading of technical German in various scientific fields. Primarily for science majors. Prerequisite: German 3. (3F, 3W, 3Sp) staff

Upper Division

100, 101, 102. Introduction to German Literature. Offered mainly for third-year students to bridge the gap between intermediate readings and more advanced upper division literature courses. Extensive reading of selected German authors, using annotated texts. Strongly recommended for German majors. Prerequisite: German 6. (2F, 2W, 2Sp)


105. Advanced Grammar and Composition. Rapid review of grammar. Application of grammatical rules and principles to the writing of original compositions in German. Prerequisite: German 6. (3F) Trendota, Staff

112. Applied Linguistics: German. Principles of language learning as applied to German. Theory and development of the concept of pattern drill. Analysis of linguistic problems encountered by teachers and students of German. Required of all teacher candidates. Prerequisite: German 105. (3Sp) Staff

115. Introduction to Poetic Forms and Theories. A study of German literary types; elements of versification; theory and practice from 1624 to the present. Reading of illustrative works. Prerequisite: German 6. (2W) Trendota

**120. Nineteenth Century Novelle.** Reading and discussion of representative stories by Hauff, Storm, Stifter, Keller, Meyer and others. Prerequisite: German 102 or equivalent. (3W) Trendota, Beyers

**121. Lessing, Plays and Biography.** Prerequisite: German 115. (3Sp) Trendota, Staff

**122. Schiller, Plays, Poetry and Biography.** Prerequisite: German 115. (3Sp) Beyers, Staff

**123. Twentieth Century German Literature.** Exclusive of lyric poetry. Reading and discussion of representative stories by Schnitzler, Mann, Hesse, Kafka, Fallada and others. Prerequisite: German 100. (3S) Beyers

**125. The Middle Ages.** A survey of the outstanding literary works and authors of the Middle Ages. Prerequisite: German 100. (3F) Trendota

**126. Survey of German Literature.** The 18th Century. (3W) Trendota

**127. The Romantic Movement.** A survey of the chief literary groups, personalities, trends, and ideas of the Romantic Movement and a study of the characteristics of Romantic Literature. Prerequisite: German 116. (3F) Trendota, Beyers

**129. Goethe’s Dramas.** Goethe’s dramas other than Faust I and II. Gots von Berlichingen, Urfaust, Iphigenie, Tasso, Egmont. The influence of Goethe’s life upon these works. Prerequisite: German 116. (3F) Trendota, Beyers

**130. Goethe’s Faust—Part 1.** Prerequisite: German 115 and 129. (3Sp) Trendota, Beyers

131. Goethe’s Prose. Werther, Dichtung and Wahrheit and selections from Wilhelm Meister. Reading of a biography of Goethe. Prerequisite: German 115. (3W) Beyers, Trendota

**133. German Drama of the Nineteenth Century.** Rapid reading and discussion of representative plays from Kleist to Hauptmann. Prerequisite: German 102 or equivalent and German 115. (3W) Beyers

**134. German Lyrics and Ballads.** A study of the great German poets of the 19th and 20th centuries including the analysis of individual poems. Goethe, Schiller, Uhland, Eichendorff, Heine, Platen, Lenau, Morike, Hebbel, Liliencron, Dehmel, Rilke, and others. Prerequisite: German 115. (3F) Trendota, Staff

196. 197, 198. Intensive Basic German. A beginning course designed to give advanced degree candidates minimal reading skills. Prerequisite: Graduate standing or previous mastery of a related second language. (3F, 3W, 3Sp) Staff

199. Readings and Conference. Readings in technical, scientific, and literary German. Credit arranged. Not more than 5 units total may be earned by any student. (F, W, Sp) Staff

Greek

1. 2. 3. Elementary Greek. (5F, 5W, 5Sp) (Taught only on sufficient demand.) Staff

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 (6F, 5W, 5Sp) (Taught only on sufficient demand.) Staff

4. 5. 6. Intermediate Latin. Readings from the orations of Cicero and Virgil’s Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3Sp) (Taught only on sufficient demand.) Staff

199. Readings and Conference. Readings in scientific, technical, or literary Latin. Not more than 2 units per quarter nor more than 6 units total may be earned by any student. Staff

Language (Linguistics and Teaching Methods)


101. Language Laboratory Practice. A course designed to give prospective teachers skill in the use of electronic, acoustical and audio-visual devices and systems as tools for learning a modern language. Prerequisite: Completion of 2 years study in any modern, foreign language. (3Sp) Staff

Portuguese
1. 2. 3. Elementary Portuguese. Grammar, dictation, conversation and reading. (5F, 5W, 3Sp) (Taught only on sufficient demand.) 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, Sp) Porter

Russian
1. 2. 3. Elementary Russian. (6F, 5W, 6Sp) Sperry

4. 5. 6. Intermediate Russian. Second-year readings and grammar review. (3F, 3W, 3Sp) 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, 2Sp) 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, Sp) Suprunowicz

Spanish
Lower Division
1. 2. 3. Elementary Spanish. (5F, 5W, 5Sp) Staff

4. 5. 6. Intermediate Spanish. Two years of high school Spanish or Spanish 3. (3F, 3W, 3Sp) Staff

4a, 5a, 6a. Second-Year Conversation. Accompanies Spanish 4, 5, and 6. Required of all Spanish majors and strongly advised for all teaching minors. Prerequisite: Two years of high school Spanish or Spanish 3. (2F, 2W, 2Sp) Staff

Upper Division
105. Advanced Grammar. Prerequisite: Spanish 6 or equivalent. (3W) Fogelberg

112. Applied Linguistics: Spanish. Attention is paid to the structure of the Spanish language, its phonemic and morphemic make-up. A study is made of how this knowledge can be applied to the teaching of Spanish; practice is given in making pattern drills for use in the laboratory and in the classroom. Prerequisite: Spanish 105. (3W) Staff

116. Readings in the Short Story. Prerequisite: Spanish 6 or equivalent. (2F) Staff

117. Readings in the Novel. Prerequisite: Spanish 6 or equivalent. (2W) Staff

118. Readings in the Theatre and Poetry. Prerequisite: Spanish 6 or equivalent. (2Sp) Staff

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. Prerequisite: Spanish 116, 117 or 118. (3F, 3W, 3Sp) Porter, Reese

125. Survey of Spanish Literature. The early literature and the writers of the Siglo de Oro. Prerequisite: Spanish 118. (3F) Fogelberg, Reese

126. Survey of Spanish Literature. From the Siglo de Oro to the later 19th Century. Prerequisite: Spanish 116, 117 or 118. (3W) Fogelberg, Reese

127. Survey of Spanish Literature. The later 19th Century and the 20th Century. Prerequisite: Spanish 116, 117 or 118. (3Sp) Fogelberg, Reese

128. 19th Century Spanish Poetry. A study of Spanish poetry of the 19th Century. Prerequisite: Spanish 118 or Spanish 126 or 127. (3Sp) Fogelberg

129. Cervantes. Reading and analysis of Don Quixote and other works of Cervantes. Prerequisite: Spanish 117 or 125. (3W) Reese

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 Calderón de la Baca. Prerequisite: Spanish 118 or 125. (3F) Reese, Porter

135. Modern Hispanic Culture. A study of the present-day social political and economic conditions of Spain, and of the various Latin American countries. Prerequisite: Spanish 6 or 6a. (3F) Porter


145. The Development of the Spanish-American Novel. Representative novels from various Spanish-American countries and from various literary periods. Prerequisite: Spanish 116, 117 or 118. (3W) Porter
234 College of Humanities and Arts

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, Sp) Staff

English for Foreign Students

14, 15, 16. English for Foreign Students. Structure of the language, with exercises and drills, for increasing comprehension and ability to write accurately. Required of all foreign students who have failed to make required scores on English proficiency examinations on entering college. It may be used as an elective by others. (3F, W, Sp) Johnson

30. English Phonetics for Foreign Students. To train in the sounds of English, and to increase ability to speak with the rhythm and intonation of American English. May be taken in conjunction with Language 14, 15, 16. (3F, W, Sp) Meyer

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. (5Sp) 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) Meyer

140. History of Ancient Philosophy. The development of philosophical thought in the ancient Greek world. Emphasizes reading from the Pre-Socratics, Plato, Aristotle, the Stoics, and Epicureans. (3F) Beyers

*141. History of Early Modern Philosophy. European thought from the Renaissance through the 18th Century, indicating the relationship of philosophic ideas to science, religion, and society. Readings in the metaphysics, logic, value theory, and theory of knowledge of Descartes, Hobbes, Spinoza, Leibnitz, Locke, Berkeley, Hume, and Kant. (5W) Beyers

142. History of Nineteenth Century Philosophy. European thought from Kant to Nietzsche, indicating the relationship of philosophic ideas to science, religion, and society. Readings in the metaphysics, value philosophy, logic, and theory of knowledge of such thinkers as Bentham, Mill, Comte, Hegel, Schopenhauer, Marx, and Nietzsche. (5Sp) Beyers

160. Philosophy of Science. Assumptions and implications of scientific methods and findings: law, convention, determination, causality, truth, and value in the physical, biological and social sciences. (3Sp) Beyers

161. Symbolic Logic. Deductive systems, valid and invalid arguments; logical paradoxes; sentential calculus and introduction to predicate calculus. (5Sp) K. Suprunowicz

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 classes as non-sectarian yield University credit.
Philosophical Literature Courses

English 34, 35, 36. Great Books and Ideas. (See English Department.)


English 48. Modern European Literature. (See English Department.)

English 58. Modern American Literature. (See English Department.)

English 68. Modern English Literature. (See English Department.)

Zoology 107. History and Literature of Biology. The more important men and ideas in the historical development of biology. (4F) Gardner


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 many register for one, two or three quarters. (2F, 2W, 2Sp) Harmon

Zoology 131. Mechanics of Evolution. Critical study of the facts and theories pertaining to the biological principles of evolution with emphasis on how it occurs. Prerequisites: Zoology 112, 4 or Botany 24, 25. Three lectures. (3W) Staff

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, 3Sp) Harmon

Enelilh 147, 148, 149. Comparative Literature. (See English Department.)

Department of Music

Head: Associate Professor Max F. Dalby
Office in Music Building

Professors Alma Dittmer, Irving Wasserman; Assistant Professors M. E. Puffer, Richard Strawn, Alvin Wardle.

The Department of Music serves three functions: (1) Provides courses which meet lower division or general education requirements in Humanities and Arts; (2) Provides courses to 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. A placement examination in music theory will be administered to each Freshman student. This examination will determine whether the first course in music theory should be preceded by a course in music fundamentals. In this case, the music theory sequence will be taken in the Sophomore year.

Every student is expected to meet minimum standards of performance on his major instrument. He will be required to take at least 6 quarters of private instruction at Utah State University. His specific individual instruction requirement will be determined by the major professor. Transfer and re-entering students must submit to an examination and evaluation during their first quarter of study in the department.

Graduating Seniors will be required to appear in recital. Group instruction requirements
may be waived by examination. The following course sequence is recommended for respective specialization.

Music Education Major

FRESHMAN YEAR

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<tr>
<th>Course</th>
<th>Credit</th>
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<tr>
<td>Theory</td>
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<td>Theory</td>
<td>5</td>
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<td>80 Group Piano</td>
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<td>Private Instruction</td>
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<tr>
<td>Band/Orchestra/Choir</td>
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SOPHOMORE YEAR

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<td>Theory</td>
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<tr>
<td>Theory</td>
<td>5</td>
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<tr>
<td>81 Group Vocal</td>
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<tr>
<td>82 Group Woodwind</td>
<td>3</td>
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<tr>
<td>85 Group Percussion</td>
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<tr>
<td>Private Instruction</td>
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<td>Band/Orchestra/Choir</td>
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JUNIOR YEAR

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>101 Music History and Literature</td>
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<td>102 Music History and Literature</td>
<td>3</td>
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<tr>
<td>103 Music History and Literature</td>
<td>3</td>
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<tr>
<td>140 Choral Conducting</td>
<td>3</td>
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<tr>
<td>141 Instrumental Conducting</td>
<td>3</td>
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<tr>
<td>150 Music for Elementary Schools</td>
<td>3</td>
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<tr>
<td>107 Scoring and Arranging</td>
<td>3</td>
</tr>
<tr>
<td>83 Group Brass</td>
<td>3</td>
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<tr>
<td>84 Group Strings</td>
<td>3</td>
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<tr>
<td>Private Instruction</td>
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<tr>
<td>Band/Orchestra/Choir</td>
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<tr>
<td>Certification Requirements</td>
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SENIOR YEAR

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<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>151 Secondary School Methods</td>
<td>3</td>
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<tr>
<td>152 Secondary School Methods</td>
<td>3</td>
</tr>
<tr>
<td>153 Secondary School Methods</td>
<td>3</td>
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<tr>
<td>Band/Orchestra/Choir</td>
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<tr>
<td>Private Ensemble</td>
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<tr>
<td>Minor Instrument</td>
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<tr>
<td>Certification Requirements</td>
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</table>

Music Education Minor

For a minor in Music Education a student must take at least 18 hours in music, which shall include the following courses or their equivalent:

Applied Music Majors

Those selecting this program should have demonstrated outstanding competence vocally or instrumentally during their Freshman and Sophomore years and give indications of a promising talent beyond the average music student.

Students are required to complete a basic core of studies in theory, music history, music literature, and conducting. Studies beyond these prerequisites will be in private instruction and ensemble performance.

Major in Strings

Students majoring in Violin, Viola, or Cello must pass a minimum proficiency examination in piano in order to satisfy the requirements for a major in Strings. The ability to sight read simple piano accompaniments will satisfy this piano proficiency requirement. The successful completion of 1 hour of Group Piano Instruction and 2 hours of Individual Piano Instruction will also satisfy the piano proficiency requirement.

All Applied Music Majors in Strings must register for private instruction on their major instrument and participate in the University Orchestra every quarter during each quarter of study at Utah State University. Violin, Viola, and Cello majors are required to take weekly one-half hour private lessons during their Freshman and Sophomore
years, and one hour lessons during their Junior and Senior years. Each major shall give an individual graduation recital in his Senior year.

Course Requirements

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>4 Beginning Theory</td>
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<td>5 Beginning Theory</td>
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<td>6 Beginning Theory</td>
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<tr>
<td>104 Advanced Theory</td>
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<td>105 Advanced Theory</td>
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<tr>
<td>101 Music History and Literature</td>
<td>3</td>
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<tr>
<td>102 Music History and Literature</td>
<td>3</td>
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<tr>
<td>103 Music History and Literature</td>
<td>3</td>
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<tr>
<td>104 Scoring and Arranging</td>
<td>3</td>
</tr>
<tr>
<td>111 Composition, Junior Year</td>
<td>3</td>
</tr>
<tr>
<td>74 Individual Violin Inst</td>
<td>6</td>
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<tr>
<td>174 Individual Violin Inst</td>
<td>12</td>
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<tr>
<td>61 Individual Viola Inst</td>
<td>6</td>
</tr>
<tr>
<td>161 Individual Viola Inst</td>
<td>12</td>
</tr>
<tr>
<td>75 Individual Cello Inst</td>
<td>6</td>
</tr>
<tr>
<td>175 Individual Cello Inst</td>
<td>12</td>
</tr>
<tr>
<td>141 Instrumental Conducting</td>
<td>3</td>
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<tr>
<td>143 String Ensemble</td>
<td>3</td>
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Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>43 String Ensemble</td>
<td>3</td>
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<tr>
<td>143 String Ensemble</td>
<td>3</td>
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</tbody>
</table>

Recommended Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>112 20th Century Music, Sen Year</td>
<td>3</td>
</tr>
<tr>
<td>183 Enjoying Opera, Senior Year</td>
<td>2</td>
</tr>
</tbody>
</table>

Major in Piano

Prospective Piano majors must be auditioned by the major professor to determine their present level of pianistic development. All Piano majors are required to take weekly one-half hour private piano lessons during their Freshman and Sophomore years, and one hour lesson during their Junior and Senior years. Each major shall give an individual graduation piano recital during his Senior year.

Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>4 Beginning Theory</td>
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<tr>
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<td>5</td>
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<tr>
<td>104 Advanced Theory</td>
<td>5</td>
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<tr>
<td>105 Advanced Theory</td>
<td>5</td>
</tr>
<tr>
<td>101 Music History and Literature</td>
<td>3</td>
</tr>
<tr>
<td>102 Music History and Literature</td>
<td>3</td>
</tr>
</tbody>
</table>

Major in Voice

All Vocal majors must be auditioned by Professor Dittmer or Professor Puffer to determine their present vocal abilities and receive placement with the various vocal coaches. All Vocal majors are required to develop grade 4 level of piano proficiency. This may be fulfilled by one quarter of Group Piano, FA-M 80 and 2 or more quarters of Individual Piano Instruction, FA-M 64 or 164. Students with extensive backgrounds in piano performance may choose to pass this requirement by special examination in lieu of taking courses. Voice majors may be advised to fulfill the language requirement leading to the BA degree.

Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
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<td>101 Music History and Literature</td>
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<td>102 Music History and Literature</td>
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<td>103 Music History and Literature</td>
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<tr>
<td>104 Scoring and Arranging</td>
<td>3</td>
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<tr>
<td>111 Composition, Junior year</td>
<td>3</td>
</tr>
<tr>
<td>56 Vocal Repertory</td>
<td>1</td>
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<tr>
<td>57 Vocal Repertory</td>
<td>1</td>
</tr>
<tr>
<td>58 Vocal Repertory</td>
<td>1</td>
</tr>
<tr>
<td>156 Advanced Vocal Repertory</td>
<td>1</td>
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<tr>
<td>157 Advanced Vocal Repertory</td>
<td>1</td>
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<tr>
<td>158 Advanced Vocal Repertory</td>
<td>1</td>
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<tr>
<td>135 Opera Workshop</td>
<td>6</td>
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<tr>
<td>140 Choral Conducting</td>
<td>3</td>
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<tr>
<td>183 Enjoying Opera</td>
<td>2</td>
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<tr>
<td>64 Individual Instruction</td>
<td>6</td>
</tr>
<tr>
<td>164 Individual Instruction</td>
<td>12</td>
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</tbody>
</table>

Music Minor

The performance and theory requirements of the degrees in Music
and Music Education do not apply to the Music minor. Participation in one major performing ensemble will be expected as well as attendance at most concerts presented during the student’s musical studies. The program of study will be adjusted to the particular needs of each student. The student who wants a minor in Music must consult with the music faculty member with whom he will do most of his work.

Fine Arts Tours

All Music majors and minors should plan to participate in some of the excellent Fine Arts Tours available. These include annual Fall tours to San Francisco to visit the art galleries, museums and attend operas, Broadway plays, and musicals. The annual Fine Arts Tours to Europe, Mexico, and Hawaii are conducted during Summer Quarter. Students can attend plays in New York City and London. These tours are planned for a maximum learning experience and are possible at minimum cost. Up to nine hours of University credit may be earned on these summer tours. Detailed information is available in the Fine Arts Department office.

Graduate Study

Qualified graduates from accredited degree-granting institutions in Music may be admitted as candidates for graduate degrees in Music.

Three different degrees are offered: Master of Science, Master of Arts and Master of Fine Arts. The Master of Arts degree requires two years of foreign language study; the Master of Fine Arts degree requires specialized background performance or highly artistic creativity in music. For each degree, the student may select courses of study leading to a) Major in Music Education, or b) Major in 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 are required to take the Graduate Record Examination.

Twenty-five hours of music credit beyond the bachelor's degree will be recommended by the adviser. 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 courses recommended by the adviser.

Students may elect a thesis project, or a lecture-recital. All work is to be completed under supervision of the graduate committee.

To receive a Master's degree in Applied Music, one must: (1) be able to play simple accompaniments at the piano; (2) participate in large and small ensemble performance at USU on an instrument or vocally; (3) satisfy his graduate committee as to competence in vocal or instrumental specialization. (Additional private instruction may be required by the committee.); (4) prepare either a lecture recital or concert recital; (5) take the graduate record examination.

The candidate, in collaboration with his committee will select a course of study from the basic core:

1. M 202, 203, 204

Music Literature

9
Music Courses

1. Enjoying Music. Designed to increase understanding and enjoyment of music through studying and hearing selected compositions in all musical forms. (3F, W, Sp) Staff


4. Orchestra. Provides training and practical experience in a wide range of orchestral works, including symphonies and major choral works. Credit arranged. (F, W, Sp) Strawn

5. 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, W, Sp) Dalby

6. Varsity Band. A training band for students who wish to qualify for membership in the University Concert Band. A band practice 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. (1W, Sp) Dalby


8. Group Vocal Instruction. (1F, W, Sp) Staff

9. Opera Workshop. Musico-dramatic techniques for the beginning singer and coach. Study of easy scenes, one act operas and comprimarie roles in larger productions. Opportunity to participate in major productions. Admission by audition. (1-3 Su) Staff

10. Piano Ensemble. Works for two pianos and for piano, four-hands, training in sight reading, developing ability to ensemble playing. Audition required. Four students per section. (1F, W, Sp) Wassermann

11. String Ensemble. Offers opportunities for capable string players and pianists to form trios, quartets, and other small units. (1F, W, Sp) Staff


14. Individual Piano Instruction. Wassermann and Staff

15. Individual Viola Instruction. Strawn

16. Individual Organ Instruction. Staff

17. Individual Vocal Instruction. Dittmer, Puffer

18. Individual Woodwind Instruction. Dalby

19. Individual Brass Instruction. Hanson, Wardle

20. Individual Percussion Instruction. Staff

21. Individual Violin Instruction. Staff

22. Individual Cello Instruction. Robertson

23. Piano Literature. A listening course designed to present piano music for the general student as well as the trained musician. These courses are accepted for the Humanities and Arts group requirement. It is not necessary to read music nor play the piano to benefit from this course. Fall quarter: Piano music to the time of Beethoven; Winter quarter: to the early romanticists; Spring quarter: Up to the Contemporary Composers. During all quarters, representative piano literature is analyzed and performed by the instructor. (2F, 2W, 2Sp) Staff

24. Conducting and playing minor instruments.

25. Sight Singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony.

26. Sight singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony.

27. Sight singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony.

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89. Sight singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony.

90. Sight singing, ear training, rhythmic reading, melody and harmonic writing and keyboard harmony.
81. Group Vocal Instruction. (1F, W, Sp) 
    Dittmer, Puffer
82. Group Woodwind Instruction. (1F, W, Sp) 
    Dalby
83. Group Brass Instruction. (1F, W, Sp) 
    Hanson, Wardle
84. Group String Instruction. (1F, W, Sp) 
    Strawn
85. Group Percussion. (1F) 
    Dalby
86. Group Percussion. (1F) 
    Dalby
87. Group Percussion. (1F) 
    Dalby
88. Group Percussion. (1F) 
    Dalby
89. Group Percussion. (1F) 
    Dalby
90. Group Percussion. (1F) 
    Dalby
91. 92. 93. Music Arts. Several approved 
    concerts, musical recitals, plays and motion 
    pictures are scheduled each quarter with 
    attendance required at a specific number of 
    these events. Passing grades will be awarded 
    for those attending the programs and meeting 
    minimum requirements. (1F, 1/2W, 1/2Sp) 
    Tippett
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. (3F, 3W, 
    3Sp) Wassermann
104. 105. 106. Advanced Theory. 
    Continuation of Beginning Theory. Includes advanced 
    sight singing, keyboard modulation and intro­ductory 
    counterpoint (5F, 5W, 6Sp) Dittmer
107. Scoring and Arranging. Study of each 
    of the standard instruments in use today, 
    their employment in small ensembles and 
    large groups. Scoring and arranging for 
    band and orchestra. (8W) Dalby
108. Counterpoint. Writing music in 16th 
    century contrapuntal style. (3Sp) Dalby
111. Composition. Projects in creative com­ 
    position for more advanced students. Pre­
    requisites 106 and 107. (3Sp) Dittmer
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. (3Sp) 
    Wassermann, Staff
124. Chamber Orchestra. The preparation 
    and performance of music for chamber or­
    chestra and theatre. To serve regularly in 
    conjunction with the spring musical, operas, and 
    programs devoted to the 18th century reper­
    toire. Strawn
135. Opera Workshop. Musical and theatrical 
    techniques for the singing actor, pianist-coach, 
    and music-theatre director. Performances of 
    scenes, one act operas and at least one major 
    production during year. Audition required for 
    singers and pianists. (3Su, arr. 1-4, F, W, Sp) 
    Puffer
136. University Chorale. A select mixed con­
   cert chorus performing a wide range of 
    chorale literature. Attendance required at all 
    public performances. Admission by audition. 
    Auditions are conducted at first and second 
    rehearsals, or by appointment with the di­
    rector. Open to lower and upper division 
    students. (2F, W, Sp) Puffer
137. Madrigal Singers. Study and perform­
    ance of madrigals, motets, and distinctive 
    choral literature. Membership by audition. 
    Auditions are conducted at first and second 
    rehearsals or by appointment with the direc­
    tor. (2F, W, Sp) Dittmer
138. Men’s Chorus. A selected group of men 
    singers. Admission by audition. Auditions are 
    conducted at first and second rehearsals or by 
    appointment with the director. (1F, W, Sp) 
    Puffer
140. Choral Conducting. Basic routines of 
    organizing and training choruses. Assigned 
    projects in conducting small and large vocal 
    ensembles. (3F) Puffer
141. Instrumental Conducting. Basic routines 
    in dealing with instruments in ensembles, 
    band, and orchestra. (3W) Dalby
    plication of music to the elementary school class­
    room. Problems, methods, and materials in 
    singing, rhythms, creative music, reading and 
    listening. (3W, Sp) 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 (3Sp) Staff
155. Piano Teaching Methods. Designed to 
    prepare qualified pianists to teach piano ac­
    cording to the latest methods, and acquaint 
    them with the newest music materials and 
    techniques. Problems common to piano teach­
    ing analyzed, and teacher-student relationships 
    emphasized. (1Sp) Wassermann
156, 157, 158. Advanced Vocal Repertory. The 
    German Lied and contemporary song literature. 
    Prerequisite: M 46. (1F, 1W, 1Sp) Puffer
163. Piano Workshop. An intensive course 
    for advanced piano students and piano teach­
    ers. Includes lectures on basic harmony, piano 
    techniques, memorization, building repertoire 
    and teaching materials. (1Su) Wassermann
183. Enjoying Opera. History and traditions 
    of music theatre through lecture and record­
    ings. (2W) Puffer
184. Sacred Music. Evolution of cantata and 
    oratorio and consideration of modern hymns 
    and sacred music. (3W) Staff
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. (3Sp) Staff

202, 203, 204. Music Literature. An advanced course, primarily for graduate students; designed to study the development of Western Music from Monody to the present through analysis of its form and structure and through an exhaustive investigation of all available literature about music. Fall quarter covers the period to and including the Renaissance and Baroque. Winter quarter covers Classicism and Romanticism; Spring quarter, 20th Century and American music. Recommended prerequisites: M 6, 101, 192, 105. (3F, 3W, 3Sp) Staff

205. Special Problems in Music. An advanced course designed to meet specific problems of the music educator. (1 to 3Sp) Staff

221a. Woodwind Clinic. An intensive study of the woodwind instruments, with recommended methods of teaching. Daily, June 14-24. (1Su) Staff

221b. Brass Clinic. An intensive study of the brass instruments with recommended methods of teaching. Daily June 14-24 (1Su) Staff

221d. Percussion Clinic. An intensive study of the percussion instruments with recommended methods of teaching. Daily, June 14-24 (1Su) Staff

235. Opera Workshop (Advanced). Designed for the advanced singer, conductor-coach and director. Directors will be assigned scenes and one-act operas to direct. Conductor-coaches will prepare and perform scenes and assist with the major productions. Advanced singers will perform leading roles in major productions. Admission by audition. (Arr. 1-3, Su) Puffer

243. 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. (1Su) Staff

251. Advanced Choral Methods. Rehearsal techniques and materials to use with the secondary school choir. The study of phonetics and its relation to good choral sound. Teachers registering for this class are expected to sing in clinic choir. Daily June 14-24 (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 14-24 (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 14-24 (1Su) Staff

258. Seminar in Music Education. Teaching and administration of various phases of the music program. Special projects. (3Su) Dalby

259. Seminar in Music Theory. A study of the practical aspects of musical theory as related to analysis, pedagogy and composition. (3Su) Dittmer

260. Seminar in Music Literature. A graduate course designed to give a survey of important musical literature and vital source material for its study. (3Su) Staff


287. 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, 3Sp, 3Su) Staff
Department of Speech

Head: Professor Rex E. Robinson
Office in Main 33

Professors Burrell F. Hansen, Chester J. Myers, Emeritus; Associate Professors Samuel G. Fletcher, Jay R. Jensen, Richard D. Taylor, Gwendella Thornley; Assistant Professor A. Ray Johnson; Instructors Rey L. Barnes, Farrell Black.

Bachelor of Science Degree.
The Department of Speech offers training in Interpretation, Public Address, Radio and Television Broadcasting, and Audiology. The requirements of at least 45 credits for a Departmental major or a teaching major in Speech are as follows: Public Speaking, eight credits (Speech 125 and 109 or 113 required of all majors); Interpretation, eight credits (Speech 124 required of all majors); Theatre Arts, eight credits (Theatre Arts 146, 50, and 24 required of all majors); Audiology, 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.

Students who plan to acquire certification in the field of Speech Pathology and Audiology must meet special requirements and should consult Dr. Samuel G. Fletcher, Director of the Speech and Hearing Center.

If emphasizing Radio-Television, the speech major is required during his Junior and Senior years to obtain one year's broadcast experience at a commercial or educational television or radio station.

A composite Speech-Theatre Arts major requires the following Speech courses: Public Speaking, eight credits; Interpretation, eight credits; Speech Pathology, five credits; Radio-TV, three credits; Teaching of Speech, three 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 Theatre Arts Department in this catalog.

Graduate Study

The Department of Speech offers a Master of Science degree and the Master of Arts degree in the following fields: Interpretation, Public Address, Broadcasting, and Speech Pathology and Audiology. Graduate students taking speech courses in the 100 series, usually taken by upper division students, will be expected to present additional projects at the option of the instructor.

Speech Courses

1. Fundamentals of Speech. Study and training in voice, body, language, meaning and personal adjustment as applied to speaking, reading, group leadership and broadcasting. (5F, W, Sp) Thornley, Black, Johnson

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, Sp) Thornley


12. Individual Problems. Individual attention given in private to needs in an effort to eliminate defects and develop skill in speech. Recommended for anyone needing individual speech instruction and for speech majors. Special fee. May be taken more than one quarter. Credit arranged. (F, W, Sp) Staff

**16. Dialect.** The most prominent dialect works of Burns, Kipling, Drummond, Riley, Dunbar, Harris, Kirk and other writers are studied. (3Sp) Staff

21. Intermediate Public Speaking. Work with types of speaking that are the most interesting and useful and determine the length of speeches and times to speak, within the framework of certain minimum requirements. Emphasizes developing skill in speech presentation. Prerequisite: Speech 1 or English 1, 2 and 3. (3F, W, Sp) Robinson, Black, Johnson, Thornley

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) Staff

67. Fundamentals of Communication Science. An introduction to the basic science of communication. Consideration given to the biological elements of sound production and manipulation, the physics and psycho-physics of sound, and the phonological principles and processes whereby sounds are combined into meaningful patterns. Laboratory demonstrations and applications are included. (5F, Sp) Fletcher

73. Directed Observation: Speech and Hearing Laboratory. Includes observation of diagnostic procedures and speech and hearing therapy. Selected readings required. Enrollment limited. Credit arranged. (W) Staff

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, Sp) Jensen

77. Phonetics. An analysis of the phonetic and phonatory aspects of speech. (3W) Jensen

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) Jensen

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. (3Sp) Hansen

85. Radio-TV Operations. Audio and video control operations for Radio and Television. Includes microphones, audio console operation, record/playback techniques, and camera operations. Two lectures and three hours laboratory per week. (3F) Barnes

101. Parliamentary Procedure. (1F) Robinson

105. Technical and Professional Speaking. Meets speech needs of technically trained and professional people. Speaking experiences such as those encountered in career situations. Prerequisite: Speech 1 or English 1, 2 and 3. (3F, W, Sp) Robinson

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


110. Play Reading. Attention given to cutting and building for public programs. (8Sp) Johnson

**111. Psychology and Semantics of Speech.** Principles of psychology which underlie speech. Personal adjustment through speech. An insight into the process of symbol use. (3F) Johnson

112. Private Instruction. Individual attention given in private to needs in an effort to eliminate defects and develop skill in speech. Recommended for anyone needing individual speech instruction and to speech majors. Special fee. May be taken more than one quarter. Credit arranged. (F, W, Sp) Staff

**113. Argumentation.** Information and practice in techniques of analysis, investigation, evidence, reasoning, briefmaking, refutation and construction and delivery of the argumentative speech. (3F) Robinson

115. Intercollegiate Debating. Members of debating squads may receive not more than three credits in any one year. (3F, W, Sp) Robinson


**Taught 1966-1967._
given stories of western pioneer life. Especially for the student teacher, recreation leader, church activity leader, librarian, and parent. (5F, W, Sp) Thornley

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. Recommended especially for teachers, prospective teachers, librarians and parents. (5Sp) 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. (3Sp) Thornley

124. Advanced Interpretation. The mastering of significant selections from great writers. Reading from manuscript and from memory. (5W) Johnson

125. Speech Composition. Advanced theory and practice of public speaking. Building and delivering several short speeches and reading selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore standing and Speech 1, or English 1, 2, 3. (5Sp) Robinson


168. Fundamental Anatomy of Speech and Hearing. A study of anatomy and physiology of the organs used in speaking and hearing. Emphasis given to developmental considerations and to evaluation techniques and procedures used in speech pathology and audiology. (Fletcher)

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) Jensen

170. Stuttering. Theoretical, clinical and experimental approaches to stuttering and other disorders of speech rhythm. (5Sp) Jensen

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. (5 Sp) Jensen

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) Jensen

173. Clinical Practice. Supervised diagnostic and remedial case work in speech pathology and audiology. Prerequisite: consent of instructor and Speech 172 or 175. May be taken more than one quarter. Credit arranged. (F, W, Sp) Fletcher, Jensen, Taylor

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, Sp) Hansen

190. Problems in Speech. Selected work, individually assigned, handled and directed. Speech problems of mutual interest to student and the instructor are investigated and reported upon. Prerequisite: Instructor's consent. Credit arranged. (F, W, Sp) Staff

193. Fundamentals in Audiology and Hearing Measurement. Formerly 175. Physics of sound, anatomy and physiology of the human ear, the process of hearing and hearing disorders, and survey of the field of clinical audiology. Emphasis is placed on the administration and interpretation of pure tone testing procedures. Supervised laboratory experience. (5F) Taylor

195. Hearing Aids and Residual Hearing. Formerly 210. Principles and techniques of speech audiometry, assessment of the usefulness of residual hearing, principles and
procedures in hearing aid selection, and professional relationships with the hearing aid user. (3W) Taylor

197. Audiological Evaluation. Formerly 212. Advanced theory and practice of audiological evaluation. Laboratory experience given in applying a variety of special audiometric tests. (3Sp) Taylor

201. Thesis. (2-5F, W, Sp) Staff

208. Diagnostic Methods in Speech Pathology. Diagnosis and appraisal of speech disorders, including principles and techniques used in case study interviewing, as a basis for the discriminating use of the various procedures and interpretation of examination findings. Attention also given to principles of referral for audiological, psychological and medical evaluation. (3W) Fletcher, Jensen

224. Seminar in Oral Interpretation. (2F) Johnson

225. Seminar in Rhetorical Theory. Classical backgrounds in rhetorical theory with modifications of more recent rhetoricians. (2W) Robinson

230. Seminar in Radio and Television. The literature and research on the uses of radio and television as media of communication and as instruments of social action. (2F, W, Sp) Hansen

265. Seminar in Communication Science. Consideration of fundamental science topics pertinent to advanced study in Speech Pathology, Audiology, and Speech and Hearing Science. Prerequisite: Instructor's consent. (2F) Fletcher

270. Seminar in Speech Pathology. Consideration of selected topics, pertinent to advanced studies in clinical Speech Pathology. Prerequisite: Speech 171. (3Su) Jensen

272. Public School Clinical Practicum. Supervised diagnostic remedial and case work in public school speech correction. Prerequisite: Speech 173. (4F, W, Sp) Staff

273. Clinical Practicum. Continuation of Speech 173. Emphasis given to supervised laboratory experience in analysis, diagnosis, and habilitation of the more complex communication disorders in a variety of clinical settings. Credit arranged. (F, W, Sp) Staff

274. Speech Reading and Auditory Training. Formerly 174. Principles and techniques pertaining to optimal use of vision and residual hearing by persons with impaired auditory acuity. Prerequisite: Speech 167. (3F) Taylor

275. Seminar in Audiology. Consideration of selected topics, pertinent to advanced studies in clinical audiology. Prerequisite: Speech 175 and 210. (2Sp) Taylor


279. Medical Background in Speech Pathology and Audiology. Speech and hearing specialists and medical specialists participate jointly in a series of lectures with communication disorder and the multidisciplinary approach to treatment as the common core of concern. Prerequisite: Speech 171. (4Su) Staff

Department of

Theatre Arts

Acting Head: Professor Twain Tippetts
Office in Main 303

Professor Floyd T. Morgan; Assistant Professors LeRoy Brandt, Leon I. Brauner, W. Vosco Call.

The undergraduate curriculum and Utah State Theatre productions are planned to help students prepare for teaching careers or for advanced study in Theatre Arts.

Bachelor of Arts Degree

It is strongly recommended that Theatre majors complete all general education group requirements, and the modern language requirement, by the end of the Sophomore year. Fifty credits of course work are required for the teaching and non-teaching Theatre Arts major. If the student desires to complete a composite major in Theatre Arts and another department — Music,
Visual Arts, Speech, English—he should arrange his program of studies with advisers assigned to him by the heads of the departments concerned.

Lists of courses required for majors and minors may be obtained from the Departmental office.

Each year the Utah State Theatre produces a number of plays. Theatre Arts majors are required to participate in all and Theatre Arts minors in at least two of these productions per year.

Fine Arts Tours
Theatre Arts majors and minors should plan to participate in some of the excellent Fine Arts Tours available. These include annual Fall tours to San Francisco to visit the art galleries, museums and attend operas, Broadway plays, and musicals. The annual Fine Arts Tours to Europe, Mexico, and Hawaii are conducted during Summer Quarter. Students can attend plays in New York City and London. These tours are planned for a maximum learning experience and are possible at minimum cost. Up to nine hours of University credit may be earned on these summer tours. Detailed information is available in Department office.

Graduate Study
Theatre Arts offers advanced work leading to the Master of Arts and Master of Fine Arts degrees. The graduate program in Theatre Arts prepares the student for work in educational and nonprofessional theatres. It offers training and experience in playwriting, directing, acting, designing and advanced technical practice.

During the first quarter of residence, and before admission to candidacy for either the Master of Arts or the Master of Fine Arts degree, the candidate is required to take the Graduate Record Examination given by the School of Graduate Studies and the two diagnostic and program planning examinations given by the Theatre Arts staff. The first of these is a comprehensive written examination covering theatre history, literature and criticism, acting, directing, scenery and costume design, lighting, make-up, technical practice, current drama, and theatre. The second examination is an oral skills test in which the student demonstrates before a Departmental committee his competency in voice and diction, extemporaneous speaking, and interpretative reading or acting. The results of these examinations are used to assist the student and his faculty adviser in planning a program of study and in selecting a thesis subject or creative project.

Candidates for the Master of Arts degree are required to present from the Department of Languages a statement of proficiency in reading one foreign language. The language should be one taught regularly at USU.

The candidate for the Master of Arts degree may, with the approval of his supervisory committee, present a thesis or a thesis alternate. The candidate for the Master of Fine Arts degree presents a creative project in playwriting, directing, acting, scene, costume, lighting, design or advanced technical practice. As part of the creative project and in lieu of a thesis this candidate submits an original long play or its equivalent, a production book or a project portfolio.

Theatre Arts Courses

1. Understanding Theatre. A course planned to develop understanding of dramatic art through learning the contributions made to it by playwrights, actors, directors, designers, technicians and theatre builders. (3F, W, Sp) Staff

1May be used to help fill Languages & 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. (SW) Call

10. Drama Appreciation. For the student who wishes to enhance his enjoyment of plays. Study of the major forms and styles of drama and of some noteworthy productions of selected plays. (SW) Morgan


24. Theatre Practice. Application of basic theatre production practices. Supervised rehearsals, performances, crew and staff work. Registration concurrent with FA TH 50, 54 or with permission of Theatre Arts staff. (1F, W, Sp, Su) Staff

44. Intermediate Acting. A continuation of FA TH 44, with emphasis on characterization and the development of the actor’s physical, mental and emotional resources. (SW) Call


52. Makeup. Practice of makeup for the stage. 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, 1Sp) Staff

56. Puppetry. The design, construction, and manipulation of puppets. Recommended particularly for elementary teachers. (3W) Reynolds

100, 102, 104. History of Theatre and Drama. A survey course correlating theatrical history and drama from ancient times to the present. Fall: Classic, Oriental, and Medieval; Winter: Early Renaissance through Eighteenth Century; Spring: Nineteenth Century to the present. (4F, 4W 4Sp) Staff

120. Fundamentals of Design for the Theatre. Basic design principles applied to designing for the theatre. Projects in sketching, rendering, drafting, perspective, model making, scene painting techniques. Prerequisite to FA-TH 150, 153, 154, 192, 194 and to production thesis projects. (2F) Brauner, Morgan

124. Theatre Practice. Application of basic theatre production practices. Supervised rehearsals, performances, crew and staff work. Registration concurrent with FA TH 146, 150, 152, 158, 154, 166, 196, or with permission of Theatre Arts staff. (1F, W, Sp, Su) Staff

144. Advanced Acting. Emphasis on the creative approach to acting, analysis and creation of the role and ensemble playing (3Sp) Call

146. Directing. Theory and practice of the principles of stage directing. (3Sp) Call

148. Private Instruction. Individual tutoring to develop competence in voice, acting, directing, scenic and costume design. Special fee. Credit arranged. (F, W, Sp) Staff

150. Scene Design. Application of basic principles of design to the stage setting. Development of scenic designs through color sketches, plans and models. Practice in scene painting techniques. Survey of the history of stage decoration. (3W) Morgan

151. Historic Costume for the Stage. Historical survey of the development of costume from the Egyptians to the 1900’s, with a practical approach to the reproduction for stage use of each period, as well as a study of the manners of the period. (3F) Brauner

152. Stage Costuming. Fundamentals of pattern drafting, construction of stage costumes and accessories, organization and care of costume wardrobes. (3W) Brauner

153. Costume Design. Theory and practice in the design and selection of costumes for non-realistic, historical and modern plays. Relationship of costume to character and production. Registration by consent of instructor. (3Sp) Brauner

154. Stage Lighting. Study and application of the principles of stage lighting. Lighting design, mounting of instruments and operation of control boards. Prerequisite: FA TH 50 or consent of instructor. (2W) Brandt

156. Theatre Organization and Management. Study of the managerial aspects (organization, promotion, financing) of the educational and community theatres. (2Sp) Call


1One credit hour of FA-TH 124 to be taken concurrently with FA-TH 146, 160, 182, 183, 154, 166, 166, 196.

1May be used to help fill Language & Arts group requirement.
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169. Playwriting. Analysis of dramatic structure. (3W) Morgan

166. Drama Production. Problems of play selection, casting, acting, directing, scenery construction and painting, lighting, costume and makeup. Recommended to drama teachers, MIA drama directors and recreation leaders. Students who register for this course should also register for 1 credit of FA-TH 124. (6Su) Staff

190. Problems in Drama. Selected research problems of merit and of mutual interest to students and instructors are investigated. Credit arranged. (F, W, Sp, Su) Staff

192. Projects in Theatre. Advanced work in playwriting, acting, directing, scene design, costume design, 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, Sp, Su) Staff

194. Problems of Drama Directors. Play selection, organization of the production, drama club activities, simplification of settings, lighting, costumes, financing, auditorium and stage facilities, central staging, audio-visual aids, and bibliography are studied. Recommended for directors and prospective directors of high school, church, and community theatres. (3Sp) Morgan

196. Advanced Directing. Practice in stage direction. The student selects, casts, directs, and presents short plays and scenes. Prerequisite: FA-TH 146. (3W) Staff

200. Seminar in Drama. Intensive study of special problems in drama and theatre. Credit arranged. (F, W, Sp, Su) Staff

201. Dramatic Theory and Criticism. Beginning with Aristotle's Poetics, the course explores the traditional works of critical theory that relate to the theatrical arts. Prerequisites: FA-TH 100, 102, 104. (3Sp) Staff


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

292. Advanced Projects in Theatre. Graduate projects in any branch of theatre art. Credit arranged. (F, W, Sp, Su) Staff

1One credit hour of FA TH 24 to be taken concurrently with FA TH 50, 54 and one credit hour of FA TH 124 to be taken concurrently with FA TH 146, 150, 152, 153, 164, 166, 166, 196.

Department of Visual Arts

Head: Associate Professor Harrison T. Groutage
Office in Main 308


Visual Arts

General Education Requirements. A general education in the visual arts is of lasting value to most university students. Several courses are offered which satisfy the Humanities and Arts group requirements: FA-A 1, 10, 35, 36, 37 and 40.

Bachelor of Arts Degree

It is strongly recommended that Art majors complete all general education group requirements, and the modern language requirement, by the end of the Sophomore year. This will allow students to intensively work in their art studio courses during the Junior and Senior years. Art majors must satisfactorily complete the nine basic visual arts courses: FA-A 1, 5, 6, 7, 8, 10, 14, 35, 36 and/or 37 with at least a grade of "C" or better. The design courses FA-A 5 and 6 are fundamental prerequisites and should be completed before registering for any studio classes.
Art majors may specialize in any one of the eight visual arts areas: Painting and Drawing, Advertising Design and Illustration, Sculpture, Graphics, Interior Design, Photography, Crafts, or Art Education which includes some work in all of these areas. With the permission of the major adviser, and the Head of the Department it is also possible to undertake a composite major program. The detailed outline of course requirements for each of these specializations is available at the Visual Arts Department Office. The major professor may also prescribe other courses to serve the particular needs of different students.

The quality, as well as the quantity of student art work is of great importance. Students must demonstrate their competence in original, creative expression. In the area of specialization, the major professor may require that certain upper division studio courses be repeated several times in order to more fully develop student abilities. With the exception of FA-A 135, 140, 151 and 152, all upper division courses may be repeated for additional credit.

During the final quarter, before graduation, each student will prepare a Senior Exhibition. The best art works created during the Junior and Senior years should be retained for this important exhibition. These may include paintings, drawings, sculpture, crafts, commercial designs, etc. They should be well framed or displayed in such a manner that a student’s understanding of careful selection of quality work and well designed presentation are evident.

Bachelor of Fine Arts Degree

This is a professional art degree requiring above average talent in art, intensive application and the consistent production of creative works of high quality. There is no modern language requirements. General Education requirements must be completed in the Freshman and Sophomore year in order that students can devote their Junior and Senior years to intensive work in studio art courses in the areas of their specialization.

Instead of the usual major and minor requirements, students for this degree are required to satisfactorily complete a composite Art major in closely related visual arts areas. This is a highly individualized program of study, and major advisers will establish the specific requirements of greatest value to each individual student. The nine basic visual arts courses, FA-A 1, 5, 6, 7, 8, 10, 14, 35, 36, and/or 37 must be completed with at least a grade of “C” or better. Design classes FA-A 5 and 6 must be completed before registering for other studio courses.

In order to be accepted into the BFA program, a portfolio of art work completed during the Freshman and Sophomore years must be submitted for review by the art faculty. Only students demonstrating considerable talent will be accepted for this more demanding professional degree. Transferring students must also submit a portfolio and demonstrate the same level of proficiency as Utah State University undergraduates in Art.

A portfolio of student work must be submitted for faculty review at the end of the Junior year, and a Senior Exhibit is required during the final quarter before graduation.

Art Minor Requirements

The requirements for a minor in Art are flexible and can be completed in any of the major areas of specialization. Generally, the mini-
mum requirements include FA-A 1, 5, 8, 14, and some courses in the art history sequence in addition to electives.

Undergraduate Program

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 majors are required to take the following: FA-A 9, 13, 81, 82, 83, 84, 104, 105, 109, 111, 112, 181, 182, 183, 184, 192. Illustration majors are required to have the additional courses: FA-A 191, 193. Additional prescribed classes to be selected on consultation with advisers are: FA-A 27, 28, 29, 57, 58, 59, 85, 185.

Art Education. To teach art in the secondary schools students should major in Art Education. Prospective teachers are encouraged to acquire an extensive background in several art areas. Their own creative work should demonstrate better than average ability. Broad understanding and creative production are great assets to the art teacher who wants to be a motivating example to his students and sensitive to different student possibilities. In addition to the nine basic courses Art Education majors are required to take the following classes: FA-A 81, 191, 192, 27, 30, 40, 60, 111, 115, or 116, 127, 135, 152, plus additional classes prescribed by the adviser.

Minimum requirements for an Art minor for students majoring in Elementary Education: FA-A 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: FA-A 19, 30, 31, 60, 119, 130, 131, 132, 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: FA-A 40, 66, 115, 116, 166 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: FA-A 40, 66, 111, 116, 135, 140, 142, 143, 144; C&T 24. Additional prescribed classes to be selected on consultation with advisers are: FA-A 15, 19, 81, 82, 83, 30, 60, 121, 191, 127, 166; LA 3; Horticulture 118; Household Economics & Management 65; IE 74.

Jewelry and Metalsmithing. Various metals provide exciting possibilities for the creative artist. For centuries molten metal has been used to cast sculpture. Now hammered sheets of metal can be formed into exciting sculptural pieces. Welding techniques can be used to create art of three dimensional design. There are unlimited possibilities for artistic design in creation of modern jewelry. In addition to the basic nine courses, Jewelry and Metalsmithing majors are required to take: FA-A 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: FA-A 9, 13, 104, 105, 109, 111, 112, 127. Additional classes prescribed: Visual Arts 25, 30, 40.

Photography. Photography is one of the most recent art forms. National and international exhibits of photographs in color and black and white have aroused great interest. There are many opportunities for photographers in the commercial world of advertising and illustration. Photography majors should take FA-A 1, 5, 8, 35, 36 and/or 37, and 135 as a basic art minimum. Photography courses should include FA-A 53, 54, 56, 57, 58, 59, 157, 164, 165, and 170. In order to develop professional competence, several of these upper division studio courses can be completed with additional credit.

Students planning on operating their own photography studio as a business, should take BA 100, Survey of Accounting Principles, and BA 147, Managing a Small Business. Social Psychology 161, Sociology 70, and Landscape Architecture 3 are also recommended for all Photography majors.

During the final quarter of the Junior year, students must plan a display of their photography portfolio. The required Senior Exhibition will display the best black and white and color photography prints in a well-designed show given dur-
ing the final quarter before graduation.

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: FA-A 9, 12, 13, 30, 40, 104, 105, 109, 111, 112, 183, 191, 193, 194, 195 plus additional courses prescribed by major professor.

Sculpture is one of the oldest forms of artistic expression and the contemporary sculptor is still utilizing the ancient materials of wood, stone, clay and metal but with new insights. New materials and new techniques have broadened the range of sculptural expression. Proficiency in drawing and modeling and plaster casting are first objectives. At the same time some understanding of the structural nature of the various sculptural media is expected to be developed. In addition to the basic requirements for all Art majors, Sculpture majors are required to complete satisfactorily with a B average the following courses: Visual Arts 9, 13, 19, 30, 31, 104, 105, 60, 160, plus additional courses based on individual needs as recommended by the major professor.

Fine Arts Tours

Visual Arts majors and minors should plan to participate in some of the excellent Fine Arts Tours available. These include annual Fall tours to San Francisco to visit the art galleries, museums and attend operas, Broadway plays, and musicals. The annual Fine Arts Tours to Europe, Mexico, and Hawaii are conducted during Summer Quarter. Students can attend plays in New York City and London. These tours are planned for a maximum learning experience and are possible at minimum cost. Up to nine hours of University credit may be earned on these summer tours. Detailed information is available in Department office.

Graduate Study

Challenging opportunities for graduate study and creative performance are available in many areas of the Visual Arts. Students may choose to qualify for either the general Master of Arts degree or the more specialized Master of Fine Arts degree.

Master of Arts Degree. This is the liberal studies degree at the graduate level and general requirements are listed in Part I of the Graduate Catalog. Additional requirements specified by the Department include: (1) A minimum proficiency in one foreign language must be demonstrated in tests administered by the Department of Modern Languages. All graduate majors in art are encouraged to participate in the annual Fine Arts Tours of Europe and Latin America and further develop their language proficiency while experiencing original masterpieces of art firsthand. (2) A portfolio of art work must be presented to the Visual Arts staff for its consideration. The art faculty will determine whether a student 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) A thesis project should be selected during the first quarter of graduate study with the aid of the graduate committee. No more than three hours of thesis
credit can be carried per quarter. A written and illustrated record must be kept of the progress on this creative thesis project. (4) Before the time of graduation the student must design a comprehensive exhibit of his graduate work which has been approved by the graduate committee as most representative of the best work done under faculty supervision. The thesis project should be an important part of this display. (5) At their discretion, the art faculty may select one finished work for the permanent collection of Utah State University. (6) Prior to the final examination, colored 35mm slides of the “Master’s Exhibit” should be presented to the Visual Arts Department as a permanent visual record of the graduate work.

Master of Fine Arts Degree. This is a specialized professional degree. In 1959 the College Art Association of America approved the MFA, rather than the PhD as the terminal degree in the Studio Arts. Whereas an exceptional student devoting full time might qualify after four quarters, it is generally considered to require an average of two years to produce enough art works of sufficient quality to be recommended for this degree. The accumulation of credit hours and the number of quarters in residence are not major factors in granting the MFA degree. The emphasis is on the productive demonstration of high artistic and technical achievement by students with considerable creative abilities. Only students whose previous art works indicate a promising potential in art will be accepted for admission to the MFA art program.

Because the MFA degree is highly individualized, the student should consult the Department or his graduate committee for more detailed information on requirements.

Visual Arts Courses

1. Exploring Art. Designed to increase enjoyment of living through the sense of sight. Develops understanding of basic principles underlying the visual forms of art in everyday life. (3F, W, Sp) Staff

5. Beginning Design. Introduces the basic art elements and is comprised of projects largely in two dimensions. Required of Visual Arts Majors. (3F, W, Sp) Prerequisite to FA-A 14. 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. (3W) Staff

8. Basic Drawing. An individually creative approach to drawing natural forms from observation and memory. Various media are used. Prerequisite to all painting courses. (3F, W, Sp) Prerequisite to FA-A 5. (3W) Staff

9. Anatomy for Artists. Analysis of bone structure of the body, with emphasis on surface characteristics. Prerequisite to Life Drawing. (3W) Staff

10. Analyzing Contemporary Painting. There are many kinds of “Modern Painting” because artists are highly individual and they strive to achieve different purposes. A text and other illustrative materials are used to help understand contemporary trends in art. (3F, W, Sp) Staff

11. Beginning Watercolor. Experimental approaches with transparent watercolor, casein, gouache. Part of the quarter will be spent out-of-doors sketching directly from nature. Prerequisite: Beginning Drawing. (3F, W) Staff

12. Intermediate Drawing. A continuation of Basic Drawing emphasizing more complex drawing problems and requiring a deeper analysis of the essentials in the subject matter. All drawing media are used. Prerequisite, FA-A 8. (3F, W, Sp) Staff

13. Drawing and Composition. Prerequisite, Basic Drawing and Intermediate Drawing. Intensive drawing in all media emphasizing various approaches to composition. (3W, Sp) Staff

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, W) Prerequisite FA-A 5. Larson, Thorpe

Visual Arts 253
16. **Figure Drawing.** Figure drawing for the student going into the professional field of fashion, book and newspaper illustration—flat diagram and mannikin, figure in action and imagination, block forms, balance and rhythm, variety in pose, and ideal proportion. (3W, Sp)

**Thorpe**

19. **Jewelry and Metal smithing.** Making interesting jewelry and the design and production of objects in nonferrous metals, using the basic techniques of metal smithing. Emphasis on raising and fabricating metal hollowware in conjunction with the various technical means to that end: sawing, filing, soldering, buffing, etc. Prerequisites: FA-A 5, 6, 7. (3F, W)

**Staff**

30. **Introduction to Ceramics.** Beginning course in ceramics. Techniques of throwing, slab and coil building, carving, pinching. Introduction to the complete ceramic process, through the use of films, slides, and lectures. Desirable prerequisites: FA-A 1, 5. (3F, W, Sp)

**Staff**

31. **Ceramics.** Emphasis on the use of the potter’s wheel. Design and experimentation are stressed. Introduction to glazing techniques, kiln stacking and firing. Prerequisite: FA-A 30. (3F, W, Sp)

**Staff**

35, 36, 37. **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, 3Sp)

**Reynolds**

40. **Essentials in Interior Design.** A study in basic philosophy of interior design both domestic and public. Analysis of art elements and principles of design applied to home planning and furnishing. (3F, W, Sp)

**Larson**

41. **Fundamentals of Interior Design.** Practical application of art elements and principles of design applied to home decoration and furnishing. (5F, W, Sp)

**Larson**

50. **Art for Young Children.** For child development majors, mothers, kindergarten and first grade teachers. (3F)

**Larson**

53. **Color Photography.** Actual project assignments teach proper exposure of color transparencies and color negatives for projection, print and reproduction purposes. Various filters are used for color correction and creative effects. Prerequisites: Photo 57, 58, and 54. (3F)

**Clark**

54. **Photo Lighting.** Basic indoor and outdoor lighting methods. Practical projects are assigned which emphasize flood-lighting, flash, strobe and natural lighting. Prerequisites: Photo 57 and 58. (3W)

**Clark**

56. **Basic Photo Portraiture.** Using relatively simple methods students learn to reveal personality and character, not just a likeness. Study of the subject, desirable backgrounds, composition, types of lighting, films, papers, and darkroom techniques are stressed. Prerequisites: Photo 54, 57, 58. (3Sp)

**Clark**

57. **Photo Fundamentals.** Correct camera operation, landscape and simple portrait picture taking, preparation and care of chemical solutions, negative development, contact printing and elementary enlarging. (3F, W, Sp)

**Clark**

58. **Picture Taking.** Students seriously interested in photography will complete many picture taking assignments under a wide variety of conditions emphasizing proper exposure, careful composition and the creation of photographs which convey personal feeling. Recommended prerequisites: FA A 57. (3W, Sp)

**Clark**

59. **Photo Lab Techniques.** Correct darkroom methods are stressed. A variety of problems in developing and printing are investigated; over and under development with necessary compensations in printing, spotting, etching, burning, dodging, retouching and toning are taught. Special negative control methods are introduced, such as: intensification, reduction, solarization and montage. Prerequisites: Photo 57 and 58. (3W, Sp)

**Clark**

60. **Beginning Sculpture.** Study of anatomy in various plastic media; clay, plaster and wax. Analysis of skeletal structure and surface form. Prerequisite: Anatomy for Artists. (3F, W, Sp)

**Elsner**

66. **Creative Handweaving.** Introduction to basic elements and procedures of handweaving, providing a foundation for the creation of original design projects—place mats, rugs, wall hangings, room dividers, etc. (3-5F, W)

**Larson**

70. **Fashion Illustration.** Brush, pencil and wash techniques for the complete statement of various fabrics and textures to the final figure in costume in halftone; line and shadow, for reproduction and professional use. (3W, Sp)

**Thorpe**

81. **Beginning Lettering.** Introduction to basic letter forms such as Roman, Gothic, and Scripts. (3F)

**Anderson**

82. **Beginning Advertising Design.** A class to introduce the student to the many different kinds of advertising media and techniques. An assignment is met in each media, as newspaper, magazine, outdoor advertising, trademarks, letterheads, brochures, and an understanding of lettering and type in advertising design. (3F)

**Anderson**

83. **Beginning Illustration.** Basic technique in illustration. The course trains the student in producing professional advertising and illustrating art which would enable him to find employment in this field. (3F)
84. Postermaking. Techniques and methods of constructing posters. Useful for education majors. (3W) Anderson

85. Beginning Architectural Rendering. To explore different media for architectural and landscape renderings. To do finished renderings and begin to perfect a style of their own. (3W. By special arrangement) Anderson

101. Contemporary European Arts and Crafts. An art appreciation course devoted to an investigation of current European creative efforts in painting, sculpture, and the varied crafts. Taught only on the summer art tour of Europe. (3Su) Tippets

103. High Renaissance Art. A more specialized Art History class studying the works of Leonardo Da Vinci, Michelangelo, and Raphael, master painters of the Italian High Renaissance. Taught only on the summer art tour of Europe. (3Su) Tippets

104. Life drawing. Anatomical and interpretative rendering of the figure in creative composition. Various ages, sexes, body types and races are studied. (3Sp) Groulage

105. Advanced Drawing and Composition. Emphasis is given to both imaginative and outdoor sketching, sketching from life, also composition and design. Prerequisites: FA-A 5, 8, 12. (8Sp) Groulage, Thorpe


110. Modern European Painting. This course will investigate some of the major trends in contemporary European painting. Major attention will be devoted to the "School of Paris" and modern Italian painters. This will be taught only on the summer art tour of Europe. (3Su) Tippets

111. Watercolor and Related Media. Students may use any aqueous medium or combination. Several lab periods will be spent sketching out-of-doors. Prerequisite: FA-A 11. (3F, Sp) Lindstrom

112. Portrait Painting. Problems of portrait painting with emphasis on the literal representation of form. Various ages and racial types are studied. Prerequisites: FA-A 8, 14. (3Sp) Thorpe, Groulage

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 coverings done in creative embroidery. Desirable prerequisite: FA-A 5. (3Sp) Larson

118. Leathertcraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, imposing, etc. (3) Reynolds

*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. (3Sp) Staff

120. Jewelry Casting. Continuation of FA-A 20. Introduction of centrifugal investment casting, using wax as the creative medium. Original design of various types of jewelry: techniques necessary for the completion of the metal product. Prerequisite: FA-A 19. (SF, Sp) Elsner

127. Painting Workshop. Work may be done in representational or non-representational areas in oil or related media. (3W, Sp) Tippetts

128. Photography Workshop. Practical Photography workshop for teachers in elementary, junior high, or high school. The emphasis is on preparation of visual aids by photographic processes, taking newsworthy pictures for publicity and yearbook purposes, and learning fundamental photographic procedures and processes in order to assist students who are interested in photography as a hobby. (3Su) Clark

130. Ceramic Hand Building Techniques. A course devoted to the production of pottery using techniques such as coils, slabs, pinching, etc. Large pieces can be produced quite easily with these techniques and will be encouraged. In addition, glazing and decorating will be an important part of this course. Prerequisites: FA-A 5, 6, 7, 30, 31. (3F, W, Sp) Lindstrom, Elsner


132. Ceramic Workshop. Advanced work in area selected with the aid of the major professor. Prerequisites: FA-A 5, 6, 7, 30, 31, 130, 131. Credit arranged (F, W, Sp) Lindstrom, Elsner

135. Color. Color as a design element in stage lighting, painting, and everyday living. Physical, psychological and artistic aspects are correlated. (3Sp) Reynolds

136. Art Photography. Means of producing fine photographs. (3F) Reynolds

137. Art Photography. Texture, composition, lighting and print quality. (3W) Reynolds

138. Art Photography. Introduction to color, color film, color harmonies, multiple exposures and other techniques necessary to produce fine color work. (3Sp) 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, Sp) 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. Prerequisite: FA-A 40, 140. (3Sp) 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 Visual Arts Staff. (1-5F, W, Sp, Su) 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

153-154. Art Education Workshop. Help will be given on methods of presentation of many materials and techniques of practical value to the elementary and secondary teacher; chart making, posters, murals, dioramas, maps, color theory and harmony, weaving, basketry, gift making, flower and weed arrangements, and many other subjects. The workshop will give art instruction on the grade levels in which the teacher instructs. (3-5 Su) Reynolds

157. Photography for Publications. Photography for newspaper coverage of news events and sports, and for illustration in other media. Designed to meet specific needs of students who will prepare illustrated articles for publication. (3F) Staff

160. Advanced Sculpture. Individual sculptural expression in a variety of plastic media. Emphasizes aesthetic employment of form and the techniques for working in wood, stone, metal, plaster and clay. Prerequisites: Beginning sculpture FA-A 60. (3F, W, Sp) Elsner

162. Sculpture for Landscape Architecture. A study in basic philosophy of interior design both domestic and public. Analysis of art elements and principles of design applied to home planning and furnishing. (3W, Sp) Elsner

164. Photo Illustration. The major uses of photography in commercial advertising are stressed. Typical magazine and newspaper assignments are used on an individual project basis. Imaginative new ideas, novel techniques, and sensitive design layouts are emphasized. This course may be repeated a maximum of three times for credit. Admission only by permission of the instructor. (6F, W, Sp) Clark

165. Advanced Photo Portraiture. Intensive studio work and "on-the-job" portrait assignments are used to develop the insight and photo techniques necessary to produce portraits of consistently high quality for commercial studio, advertising, and editorial purposes. Admission only by permission of instructor. (5F, W, Sp) Clark

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, Sp) Larson

167. Color Printing. Students are taught how to make consistently high quality photographic color prints from their own negatives. Project assignments are given to cover a wide range of subjects under various lighting conditions. Prerequisites: Photo 53, 54, 57, and 58. (3F, W, Sp) Clark

168. Advanced Publications Photography. Actual story assignments require the preparation of detailed shooting scripts, editorial selection of promising prints, cropping and final presentation of photo stories. Projects vary from single to multiple picture coverage. Admission only by permission of instructor. (6F, W, Sp) Clark

169. Spinning and Dyeing. Spinning and dyeing of wool, flax and other fibers in the production of special yarns for creative hand-weaving—artistic rather than commercial application emphasized. Prerequisites: FA-A 66. To be taught simultaneously with FA-A 166. Advanced Fabric Design in Weaving. (3Sp) Larson

170. Photography Laws and Regulations. A lecture course designed to fit the needs of photography and journalism majors and minors, and other students who may use the camera as a reproductive tool, by dealing with laws, regulations, principles, and practices governing photography. Included are copyright regulations, libel, model release, right of privacy statutes, courtroom regulations, photographic etiquette, and others. (1F) Hansen

171 and 271. Special Studio Courses. Individual work in any one or more of following, as approved by the instructor concerned: Design Studio, Painting Studio, Printmaking Studio, Photography Studio, Sculpture Studio, Experimental Media Studio, Metalsmithing Studio, Ceramics Studio. Credit Arranged (F, W, Sp) Staff
180. Portfolio. Prior to graduation BA and BFA candidates must submit a portfolio of not less than six significant examples of their student work in the area of their specialization, properly presented in exhibition form. All such portfolios become the property of the USU Fine Arts Dept. (1Sp) **Staff**

181. Advanced Lettering. Brush letters and scripts. Finished letters for magazine and newspaper advertisements, packaging labels and symbols. Prerequisite: FA-A 81. (3W) **Anderson**

182. Advanced Advertising Design. 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 prerequisites: FA-A 5, 6, 7, 21, 22, 82. (3F, W, Sp) **Anderson**

183. Advanced Illustration. A course to prepare the student for the specialized field of illustration that exists today. To have the student experiment in different techniques and media, and learn which to use for different types of reproduction in newspaper or magazines. To learn to research a problem and meet deadlines. Prerequisite: FA-A 83 (3Sp) **Anderson**

184. Graphic Design Workshop. Advanced graphic design problems with emphasis on designing and executing pages, booklets, posters, and renderings in a variety of media for the portfolio. Prerequisites: FA-A 5, 6, 7. (3Sp) **Anderson**

185. Advanced Architectural Rendering. To perfect architectural renderings in various media to suit the student's own style in preparation for commercial work. Prerequisite: FA-A 85. (3Sp) (By special arrangement) **Anderson**

190. Survey of Mexican Art. A survey course of Mexican Art covering colonial and modern architecture and the great Mexican painters, Rivera, Orozco, and Siquieros. Taught only on the summer art tour of Mexico. (3Su) **Lindstrom**

191. Woodcut. The making of prints from designs cut in the plank grain of wood using from one to many colors. (3F) **Groutage**

192. Serigraphs. The study of various techniques in silk screen printing including glue, tusche glue, cut paper, and lacquer film for the purpose of making multiple original works of art. (3W) **Groutage**

193. Lithography. Producing prints from drawings on limestone. (3F, Sp) **Groutage**

194. Intaglio. Production of prints from metal plates using various etching and engraving techniques. (3W, Sp, Su) **Groutage**

195. Printmaking Workshop. Individual production in prints - any technique. Prerequisites FA-A 191 or 192 or 193 or 194. (3F, Sp, Su) **Groutage**

210. Thesis Photo Problems. A seminar type course designed to aid graduate students in their photographic problems related to their thesis. Discussions will lend themselves mostly to methods of obtaining necessary photographs to supplement the thesis study. Students will be given informationpertaining to the preparation of photos, charts, graphs, etc. for insertion into the final thesis. (1W) **Hansen**

272. Art Research, Seminar and Thesis Problems. Credit arranged. (F, W, Sp) **Staff**
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  Bachelor of Science
  Master of Science
  Doctor of Philosophy
College of Science

Eldon J. Gardner, Dean
Office in Forestry and Zoology 101

Utah State University has always given high place to the sciences. The organization of a College of Science in 1962 was in keeping with the trend in our nation and in the world. 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 College of Science comprises the eight departments of Applied Statistics and Computer Science, Bacteriology and Public Health, Botany, Chemistry, Geology, Mathematics, Physics, and Zoology.

The curricula of the science departments are designed to achieve four purposes:

First, they serve all students, because no college graduate today can be considered educated without a firm grasp of scientific principles. The sciences are truly liberal. They contribute to the general education as surely and as importantly as the humanities and the arts and the social sciences.

The second purpose of the College is to train teachers of science. This is an increasingly significant responsibility. America cannot move forward unless it has competent, well trained teachers of science on every level of education.

Third, the health professions are properly grounded on science. The University has an excellent record in providing pre-dental and pre-medical training. Students in these programs move directly into the professional dental and medical schools of other universities. The basic training of these people will continue to be an important part of the program in the College of Science.

Finally, the College of Science trains research scholars in the various areas of science. To become a competent chemist, physicist, geologist, or scientist in any other area, the student must have a sound undergraduate major in the subject, followed by years of graduate specialization in his field. All of the departments mentioned above offer the Bachelor's and Master's degrees and the majority of them offer the PhD degree. The production of able research scientists is of prime importance and is a major function of the departments in the college.

The opportunities for competent and conscientious students in the various science fields is unlimited. Demands for teachers and researchers are far greater than the supply. Monetary rewards are substantial and the spiritual and intellectual rewards satisfying. Science is challenging. It demands the best from students, but for those who succeed it offers a rich return.

Students planning to enter the sciences are urged to discuss their plans and goals early with their advisors, department heads, and dean. Basic course work in mathematics, chemistry, and physics is essential to most areas of science. Several scholarships are available to science students. Teaching and research assistantships are available through the science departments. General requirements for graduation are the same as those outlined for the entire University.
Department of

Applied Statistics, Computer Science

Head: Professor Rex L. Hurst
Office in Main 14

Associate Professor Lynn Davis; Assistant Professors Bartell C. Jensen, Wendell L. Pope, Donald V. Sisson, David White.

Applied Statistics

Statistics is that branch of science which deals with the development and usage of statistical inference. Statistical inference is the inductive process of generalizing from the particular to the general on the basis of sample evidence. The foundation of statistical inference lies in the theory of probability which provides a measure of reliability of the conclusions drawn from experimental data.

The experimental scientists of many fields of endeavor make extensive use of statistics as a research tool. Statistics provides the methodology for summarizing data, estimation of parameters, testing of hypotheses and formulating mathematical models to stimulate physical and biological situations.

Applied Statistics majors are prepared for further graduate study or for accepting a wide choice of well paid positions. Statisticians find employment as members of research teams in business, industrial concerns, the federal government, state governments, and private research groups. All of these provide outstanding possibilities for professional advancement.

Bachelor of Science Degree. For a major in Applied Statistics students are expected to complete Applied Statistics 131, 132, 141, 176, 177, 178, 215, and 220. They are also expected to take extensive work in Computer Science and in the Mathematics Department. It is advisable that a major in Applied Statistics have a strong minor in one of the fields of application.

Undergraduate Minor. An undergraduate minor in Applied Statistics is expected to complete at least 18 credit hours from the following courses: Applied Statistics 131, 132, 141, 171, 172, 215, 220, 221, 233.

Suggested Four-Year Curriculum

Freshman and Sophomore Years

University group requirements 45
Mathematics (35, 46, 97, 98, 99) 25
Physical Education 3
1Language (Russian, German, French) 16
Basic Communications 9

97

Junior and Senior Years

Physics or Chemistry 15
Applied Statistics (131, 132, 141, 176, 177, 178, 215, 220) 27
Computer Science (111, 145, 167) 11
Philosophy (60, 161) 10
Electives 87

100

1A modern language is recommended for those students who have plans for graduate study. Where a modern language is taken, it will substitute for five hours of the group requirements.
Computer Science

Computer Science deals with the organization and usage of data processing systems. Data processing systems consist of digital or analog computers and the associated data transmission networks.

One phase of Computer Science deals with the development of data processing systems as a part of business or research organization. It treats such problems as data collection, forms design, modernization of accounting and paper work procedures, modernization of reports, selection of computer and data transmission components to build complete systems.

A second phase of Computer Science deals with the methods and theory of programming computers and data transmission equipment to handle all types of numerical and logical information. Programming a computer or data transmission system consists of providing step by step instructions that will produce the desired result.

The Computer Science area is one of the fastest growing parts of our society. Areas such as industrial automation involving numerical and process control, business automation and a wide variety of scientific computations offer a wide range of employment opportunities.

Graduate Study

Master of Science Degree. The Department offers Master of Science degree in Statistics. The area of research includes (i) development of new tools of statistical inference, (ii) refinement of old techniques, (iii) improvement and development of the design of experiments. Students will be encouraged to take a strong minor in Computer Science.

A student seeking an MS degree in Statistics must have either a BS degree in Statistics or a BS degree in Mathematics. Majors in fields of application with a strong background in Mathematics may also be considered.

Financial assistance is available in the form of Graduate Assistantships for outstanding candidates. USU also offers a limited number of Research Fellowships which are open to all majors.

Graduate Minor. A graduate minor must fill University requirements as to total number of credit hours and must include one of the theory sequence courses, Applied Statistics 171, 172 or 176, 177, 178 or 261, 262, 263 and one of the courses, Applied Statistics 281 or 291 or Computer Science 245.

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. (4F) 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) 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. (3W) Sisson
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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. (3Sp) Sisson

176. Introductory Theory of Statistics. Set operations, combinatorial methods, probability, discrete frequency distributions, expectations, moments and moment generating functions. Prerequisite: Calculus and a knowledge of statistical methods. (3F) Hurst

177. Introductory Theory of Statistics. Continuous frequency distributions, expectations, moments and moment generating functions, linear combinations of variables, sampling and sampling distributions, point and interval estimation. Prerequisite: 176. (3W) Hurst

178. Introductory Theory of Statistics. The testing of hypotheses, Type I and Type II errors, power of the test, application of theory to the testing of means and to testing of relationships among variables. Prerequisite: 177. (3Sp) Hurst

198. Special Problems. Conferences, reading, and laboratory investigations. (Arranged F. W. Sp) Staff

199. Seminar. Review of current literature and developments in the field of statistics. (1F, 3W, Sp) 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: Applied Statistics 131 and 132 or equivalent. Three lectures, one lab. (4Sp) 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 (3Sp) 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, 263. (3 Su) Taught on demand Staff


241. Stochastic Processes. An introduction to stochastic processes and their properties. The probability law of a stochastic process. Conditional probability and conditional expectation. Fundamental properties of specific stochastic processes; the Normal process, the Wiener process, the Poisson process and its generalizations. Counting and renewal counting processes. Markov chains. Specific applications to physics, communication theory, biology, economics, etc. Prerequisite: Probability Theory. (Taught on demand) Staff

261. Intermediate Theory of Statistics. Probability theory; basic notion of sets, sample description space, events, algebra of events, probability of an event, probability theorems, combinational analysis, conditional probability, Bayes' Theorem, independent events, independence of several events, random variable, probability functions, distribution functions, discrete distributions; Bernoulli trials, Binomial, Multinomial, Hypergeometric, Poisson, negative binomial distributions, limiting theorems, continuous distributions, probability functions for continuous variate, multivariate distributions, transformations, expectation of a random variable; expectation, moment, moment generating functions, moments of multivariate distributions. Prerequisite or corequisite: Mathematics 130, 131 or 140. 141. (3F) White

262. Intermediate Theory of Statistics. Important continuous distribution, uniform, normal, gamma, beta distribution and others, inductive inference; populations and samples, Chebyshev's inequality; law of large numbers; the central limit theorem; point estimation; optimum properties of estimators; principle of maximum likelihood; multivariate normal distribution; bivariate normal, multivariate normal marginal and conditional distributions; the moment generating functions; derived distributions; distributions of functions of random variables, chi-square, student's F distributions; large sample theory; asymptotic distributions of maximum likelihood estimators. Prerequisite: 261. (3W) White

263. Intermediate Theory of Statistics. Interval estimation, confidence limits, fiducial limits, confidence interval and regions for parameters of well known distributions, test of hypotheses; regression and linear hypotheses; analysis of variance; sequential tests of hypotheses and distribution-free methods. Prerequisite: 262. (3Sp) White

281. Sampling Design. Principle steps in sample surveys; simple random sampling; properties of the estimators; sampling for proportions and percentages; estimation of sample size; two stage sampling; stratified random sampling; optimum allocation; stratified random sampling for percentages. Prerequisite: 172 or 263. (3F) (Taught on Demand) Sisson

282. Sampling Design. Ratio estimates; regression estimates; systematic sampling; sub-
sampling with units of equal and unequal size; double sampling; source of error in sample surveys. Prerequisite: 281. (3W) (Taught on demand) Sisson

291. Experimental Design. Principles of statistical design for experimental investigations in biological and industrial research; introduction 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 263. (3F) White

292. 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. (3W) White


Computer Science Courses

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, W) Davis

135. Computer Programming (1401). History and philosophy of computing; the organization of problems for solution using a digital computer; characteristics of the IBM 1401 computer; machine language and auto coder programming. Students are expected to gain the programming proficiency to enable them to program business and data processing applications on the computer. 3 lectures, 2 labs. (5F, W, Sp) Staff

145. Computer Programming (1620). 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. Three lectures, two labs. Prerequisite: Mathematics 35. (5W) Staff

157. Programming Business Problems. Discussion of problem-oriented programming languages: the use of such a language to write programs for a computer. Students are expected to learn a programming language (such as COBOL) and solve business and data processing problems using a computer. Two lectures, 1 lab. (3F, Sp) Jensen

167. Programming Scientific Problems. Discussion of problem-oriented programming languages (compilers); the use of a compiler language to write programs for a computer. Students are expected to learn a programming language and solve problems in their own field using a computer. Two lectures, one lab. Prerequisite: Math 35. (3F, W, Sp) Staff

181. Compiler Languages. The construction of symbolic language processors, problem oriented language processors, procedure oriented language processors, and their supporting libraries. Prerequisite: CS 168. (3F) Pope

182. Monitors and Systems Design. The organization and construction of a monitor; the organization of supporting systems including utility programs, input-output programs, report generators, simulator systems and sort systems. Prerequisite: 181. (3Sp) Pope

245. Techniques in Operations Research. A study of the methods and techniques used in operations research and systems engineering to efficiently organize complex systems. The study will include linear programming, assignment and allocation of resources, inventory control, least cost estimating and scheduling. Prerequisite: Graduate standing or permission of instructor. (3W) Jensen

246. Techniques in Operations Research Continuation of Computer Science 245. Study will include queuing theory, replacement models, dynamic programming, game theory and Monte Carlo Methods. Prerequisite: Graduate standing or permission of instructor. (3Sp) Jensen
Department of

Bacteriology and Public Health

(Bacteriology, Public Health, Medical Technology)

Head: Professor W. Whitney Smith
Office in Plant Industry 310

Professors Lewis W. Jones, Kenneth R. Stevens, Emeritus; Associate Professor Paul B. Carter; Lecturer Newell G. Daines.

Bacteriology and Public Health

**Bachelor of Science Degree.** A General Bacteriology major requires: Bacteriology 10 or 70-72, 104-105 or 120-121, 110, 160, 168, 180, 201, 291; Chemistry 3, 4, 5, 115, 121, 122, 180; Mathematics 35, 46; Physics 17, 18, 19; Public Health 150; Botany 24 or 25; Zoology 3, 4, 112, 116.

Students meeting requirements for the Bachelor of Science degree in Bacteriology plus Zoology 118 are eligible to apply for admission to dental or medical schools.

A **Public Health major requires:** Public Health 15, 50, 150, 155, 254; Bacteriology 10 or 70-71 or 70-72, 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; Principles of Nutrition 24, Chemistry 10, 11, 12.

Students planning a career in Public Health Laboratory work should take the following courses to satisfy the Public Health major: Public Health 15, 50, 150; Bacteriology 10, or 70-71 or 70-72, 104, 105, 120, 160, 168; Medical Technology 131; Physics 6; Chemistry 10, 11, 12, 180; Mathematics 35; Zoology 3, 4, 112, 116.

For a minor in Health Education take: Public Health 15, 50, 150; Physical Education 135; Principles of Nutrition 24, 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.** A study of the basic principles of life as illustrated by both plant and animal forms, including microbes. Four lectures, one recitation, one lab. (5W)

**10. Elementary Bacteriology.** Basic concepts, practical applications. (Not open to students who have had Bact 70.) (Four lectures, one lab.) (5F, W, Sp, Su)

**70. General Bacteriology.** The fundamental principles of bacteriology and their application to food, water, soil, dairy and disease. For Science majors or students who have had a basic biology course. (Not open to students who have had Bacteriology 10). (4F, W, Sp)

**71. General Bacteriology Laboratory.** Prerequisite: Previous or concurrent registration in Bacteriology 10 or 70. Two 3-hour labs. (2F, W, Sp)

**104. Dairy Bacteriology.** Micro-organisms of milk and its products. Prerequisite: Bacteriology 10 or 70. (3F)

**105. Dairy Bacteriology Laboratory.** Two 3-hour labs. Prerequisite: Bact 10 or 71 or 72, and previous or concurrent registration in Bacteriology 104. (2F)

**110. Soil Microbiology.** Relationships of micro-organisms to soil fertility. Prerequisite: Bacteriology 10 or 70. (2Sp)

**120. Food Microbiology.** Relationships of micro-organisms to food preservation, spoilage, and poisoning. Prerequisite: Bacteriology 10 or 71 or 72. (2F)

**121. Food Microbiology Laboratory.** (2F)

**160. Pathogenic Bacteriology.** Properties of pathogens and relationships to infectious diseases. Prerequisite: Bact. 71 or equivalent and Organic Chemistry. Three lectures, two labs. (5F)

**161. Advanced Pathogenic Microbiology.** Common pathogenic molds, yeasts, and viruses. Prerequisite: Bacteriology 160. Four lectures, one lab. (5Sp)

**168. Immunology.** Prerequisites: Bact 160 and Biochemistry. Three lectures. (5W)

**172. 173. Bacteriology Laboratory Methods.** (2W, 2Sp)

**180. Physiology of Bacteria.** Cellular chemistry and physiology. Prerequisites: Bact 10 or 70, Organic Chemistry. (4W)

**201. Systematic Bacteriology.** Classification relationships. Prerequisite: Bacteriology 10 or 70. (2Sp)

**291. Seminar.** (1F, W, Sp)

**294. Special Problems in Bacteriology.** Special assignments, reports, and discussions. Preparation of a comprehensive and critical review. Credit arranged. Prerequisite: consent of instructor. (F, W, Sp)

**299. Thesis Research.** Credit arranged. (F, W, Sp)

*Taught 1965-1966

**Taught 1966-67
Public Health Courses

15. Personal Health. Health problems of University students; especially for freshmen and sophomores. (2F, W, Sp) Staff

And Members of Cache Valley Medical and Dental Associations

50. Fundamentals of Public Health. A basic course in the principles of public health with major emphasis on health education, control of communicable diseases, community sanitation problems, radiological health. (3F) Staff

149. Current Problems in Community Health. The Current emerging problems: air and water pollution, effects of urbanization and the population explosion, proliferation of agricultural poisons, low incidence of communicable disease, radiation hazards, etc. (2Su) Staff

150. Environmental Sanitation. Consideration of regular public health sanitation programs such as waste disposal, water treatment, refuse disposal, insect and rodent control, food and milk, industrial hygiene and radiological sanitation. (4F) Staff

**151. Public and School Health Administration. Organization, administration and functions of health agencies. Prerequisite: PH 50. (3F) Staff

152. Family Health. A broad course on the fundamentals of healthful living. Open to all upper division students; especially for juniors 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) Daines

153. World Health Problems. Designed to meet the health needs of persons who plan to work or travel in foreign lands. Personal and environmental health problems in specific regions of the world. (1Su) Staff

154. School Health Program. The program for health in elementary & secondary schools. A healthful environment, healthful living, and health instructions. (4 Home study, Summer). Smith


*156. School Health Methods. Objectives, methods, curricula, and materials. Prerequisite: PH 155. (3Sp) Staff

159. Public Health Laboratory Methods. Experience in the practice of the Public Health Laboratory. (3 to 15F, W, Sp) Fraser

*Taught 1965-66.
**Taught 1966-67.

Medical Technology

The College of Science offers courses which satisfy entrance requirements for Medical Technology internships in the United States and Canada. The University provides a three-year program which, combined with the internship, qualifies you for the BS degree.

A Medical Technology major should take during the first three years: Bacteriology 10 or 70-71, or 70-72, 160, 168; Med Tech 131; Chemistry 3, 4, 5, 121, 115, 180; 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 133, 134, 135, 136, 137, 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 10 or 71 or 72. (4Sp) Carter

133, 134, 135. Applied Medical Technology. Practical work in hospital laboratories under close supervision: Clinical Bacteriology and Serology, two months; Clinical Biochemistry, three months; Clinical Hematology, one month; Pathological Tissue Methods, two months;
Blood Bank Procedures, two months; Electrocardiograph and Basal Metabolism Procedures. (19F, W, Sp) Carter

136. General Pathology Discussions. (2F) Carter

137. Clinical Laboratory Methods Discussion. (2W) Carter


139. Pathological Conference. (1Sp) Carter

Department of Botany

(Cytogenetics, Plant Pathology, Plant Physiology, Taxonomy, Virology)

Head: Professor Orson S. Cannon
Office in Plant Industry 204


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: Botany 150, 224, 225; Chemistry 101, 115, 121,
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122, 191, 192; 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; 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, Taxonomy, Virology and the Interdepartmental 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 Courses

1. Principles of Biology. Study of the basic principles of life as illustrated in both plants and animals, including microbes. Four lectures, one recitation, one lab. (5F, W) Shaw

24. Elementary Botany. The structure, physiology, and reproduction of flowering plants. Consideration given to basic structure and functions of cells, tissues, stems, roots, leaves, flowers, fruits, and seeds. Three lectures, two labs. (5F, Sp) Baker, 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. (5Sp) 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. (8Sp) Shaw

108. Agrostology. A taxonomic study of native and imported grasses of western ranges. Special attention is given to species important in grazing and soil binding. Assumes a knowledge of fundamental principles of botany. Two lectures, two labs. (4W) Holmgren

112. Aquatic and Marsh Plants. A taxonomic and ecological study of aquatic and marsh plants. Emphasizes important food and cover plants for wildlife. Assumes a knowledge of the fundamental principles of botany. Two lectures, two labs. (4F) Holmgren


*117. Anatomy. Structure and development of major cell types and tissues; comparative anatomy of the stem, root, and leaf of seed-bearing plants. Assumes a knowledge of fundamental principles of botany. Two lectures, two labs. (4W) Boyle

118. Cytogenetics. The structure, functions and modifications of chromosomes and their relationships to genetic phenomena. The laboratory emphasizes plant materials. Prerequisite: Zoology 112. Three lectures, two labs. (5Sp) Boyle
120. Elementary Plant Physiology. The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Botany 24 and Chemistry 12. (Chemistry 12 may be taken concurrently.) Four lectures, one lab. (5W, 5P) Wiebe

*121. Water Relations of Plants. Factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Prerequisite: Botany 120. (3W) Wiebe

**125. Morphology of Vascular Plants. Structure, development, reproduction, and evolution of the classes and orders of vascular plants. Prerequisites: Botany 24, 25, and 30. Three lectures, two labs. (5P) 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) Baker


*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, photoperiod, dormancy. Prerequisite: Botany 120. (3W) Wiebe

225. Mineral Nutrition of Plants. Physiological and biochemical processes involved in the mineral nutrition of higher plants. Consideration will be given to specific roles of each nutrient in plant growth and metabolism. Prerequisites: Botany 24, 120 and Chemistry 12. Three lectures, one lab. (4F) Miller

226. Plant Virology. Physical and chemical properties of viruses and their biological relationships. Prerequisite: Botany 120. (5P) Welkie

224. Special Problems. Individual instruction. Credit arranged. (F, W, 5P, 5S) Staff

250. Research. Conduct special research in plant cytology, pathology, physiology, or taxonomy. Individual instruction. Credit arranged. (F, W, 5P, 5S) Staff

*Taught 1965-66
**Taught 1966-67

Department of Chemistry

Head: Professor Melvin C. Cannon
Office in Widtsoe Hall 112

Professors Delbert A. Greenwood, Garth L. Lee, Sherwin Maeser, Emeritus, Grant Gill Smith, Harris O. Van Orden; Associate Professors Richard H. Boyd, William M. Moore, Jack T. Spence, Frank R. Stermitz; Assistant Professors Richard C. Anderson, Brice G. Hobrock H. M. Nielsen, Richard L. Redington, Anthony T. Tu; Research Assistant Professor Dexter Rogers.

Major. The degree of Bachelor of Science in Chemistry is a professional degree. Graduates who meet the requirements of the American Chemical Society, by which the Department is approved, and who fill the requirements of the University as given in this catalog, will be certified by the Society. The degree of Bachelor of Arts in Chemistry is offered for those desiring more flexibility in the academic program. Graduates with the Bachelor of Arts degree will not be certified by the American Chemical Society. Each major must attain at least a
College of Science

2.25 grade point average in Chemistry, Physics, and Mathematics to qualify for graduation.

A reading knowledge of German is required for the BS degree. This requirement is normally satisfied by the completion of German 1, 2, and 3. Two years of a foreign language are required for the BA degree. It is in the student's interest to fulfill this requirement as soon as possible.

A minimum of 60 credit hours in Chemistry is required for the BS degree and the following courses must be included: Chemistry 3, 4, 5, 121, 122, 123B 104, 105, 106, 109, 110, 111, 115, 150, 153, 160, 198, and 199. Also six credit hours of advanced courses are required which may be taken from the following courses: Chemistry 190, 191, 192, 201, 202, 203, 204, 225, 226, 227, 250, 251, 272, 287, 295; Physics 122, 130; Mathematics 140, 141, 142. Prerequisites necessary during the program are Physics 20, 21, 22; Math 97, 98, 99, 110.

A minimum of 45 credit hours in Chemistry is required for the BA degree and the following courses must be included: Chemistry 3, 4, 5, 121, 122, 123B, 104, 105, 106, 109, 110, 111, 115. Prerequisites necessary during the program are: Physics 20, 21, 22; Math 97, 98, 99, 110.

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 115, 121, 122, 180 or 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 180. Supporting courses to be taken are Physics 17, 18, 19 and Math. 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 180; Physics 17, 18, 19, 122, 130, 131 or 140; Mathematics 46, 97, 98, 120 or 150; Language 50 or 160. Required professional education courses for the teaching certificate are listed by the College of Education. A better preparation for the teaching of chemistry is possible with a combined BA degree and teaching certificate.

Suggested curricula for BA and BS degrees in Chemistry:

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<tr>
<td>Chem 198, 199</td>
<td>3 hours</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>32-41 hours</td>
<td></td>
</tr>
</tbody>
</table>

Graduate Study

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

1Not required for BA degree.
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.

**Doctor of Philosophy Degree:** The Chemistry Department offers advanced study and research leading to a degree of Doctor of Philosophy in Chemistry. Before admission to candidacy the student must fulfill the following requirements: (a) Demonstrate a reading comprehension of German and of Russian or French; (b) Pass a comprehensive examination in a field of specialization, and in two minor fields of chemistry, not later than one academic year before the final examination on the thesis; (c) Present an acceptable statement of a thesis problem. The student should consult the School of Graduate Studies or the Head of the Department concerning other requirements.

A Graduate Program in Nutrition and Biochemistry leading to a Master of Science or Doctor of Philosophy degree is available in cooperation with departments giving courses in these areas. Detailed information may be found in this catalog under the School of Graduate Studies.

**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, 5Sp) Lee

10, 11. General Chemistry. Principles of inorganic chemistry. Prerequisite: One unit of high school or college algebra. Four lectures, one lab. (5F, 5W or 5W, 5Sp) Staff

12. Elementary Organic Chemistry. An introduction to organic chemistry. Designed to follow Chemistry 11 and completes a one-year terminal course in chemistry. (5Sp) 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, 3Sp) 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 5, Math 38, or equivalent. Three lectures. (3Sp) 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, Physics 22, Math 110. Three lectures. (3F, 3W, 3Sp) Boyd, Moore, Redington

109, 110, 111. Experimental Physical Chemistry. Laboratory work correlated with Chemistry 104, 105, 106. (1F, 1W, 1Sp) Boyd, Moore, Redington

115. Quantitative Analysis. Basic theory and laboratory practice in gravimetric and volumetric analysis. Prerequisites: Chemistry 5, Math 35. Two lectures, two labs. (4Sp) Cannon

116. Inorganic Preparations. A laboratory course in practical methods of synthetic inorganic chemistry. Prerequisite: Chemistry 5, 111. (Credit arranged) Holbrook

121, 122. Organic Chemistry. Fundamentals of the chemistry of carbon compounds. Prerequisite: Chem 5. Three lectures, one lab. (4F, 4W) Anderson

123A. Organic Chemistry. A continuation of Chemistry 121 and 122 for non-chemistry majors. Prerequisite: Chem 122. Three lectures. (3Sp) Anderson

123B. Organic Chemistry. A continuation of Chemistry 121 and 122 for chemistry majors and others desiring an intensive lecture and laboratory course in organic chemistry. Prerequisite: Chem 122. Three lectures, 2 labs. (3Sp) Anderson

124. Qualitative Organic Analysis. The classification, reactions and laboratory work involved in the identification of unknown organic compounds. Prerequisites: Chem 123, 106. (4Sp) Anderson, Smith, Stermitz
150. Inorganic Chemistry. Study of the elements, compounds and bonding theories based upon the atomic structure. Prerequisite: Chemistry 104. Three lectures. (3F) Hobrock

153. Instrumental Analysis. Theory and application of physico-chemical methods of analysis. Selected electrochemical and optical methods. Prerequisites: Chemistry 106, 115. Two lectures, one lab. (3W) Spence

155. Glass Blowing. A laboratory course in the technique of manufacturing and repairing pyrex brand laboratory glassware. Alternate years. (2W) Staff

160. Undergraduate Seminar. (1W) Staff

180. Elementary Biochemistry. A brief survey of the chemistry of biologically important compounds such as carbohydrates, lipids, proteins, nucleic acids and enzymes including their role in animal and plant metabolism. Qualitative and semi-quantitative experiments with important compounds are performed. This is a terminal course normally not intended to meet requirements for more advanced work in biochemistry. Prerequisites: Chemistry 5, 121. Four lectures, one lab. (5F) Tu, Van Orden

190. Principles of Biochemistry. A study of the chemical and physical behavior of biologically important compounds including the chemistry of carbohydrates, lipids, proteins and hormones with an introduction to enzymatic processes, bioenergetics and metabolism. Prerequisites: Chem. 106, 122 (or special permission). Four lectures, one lab. (6F) Tu, Van Orden


193, 194. Biochemistry Laboratory. Laboratory experiments illustrating general principles in studying biological materials. To accompany Chem 191 and 192. Prerequisites: Chem 190 (or special permission). Two labs. (2W, 2Sp) Tu, Van Orden

195. General Pharmacology. Lectures and laboratory work dealing with principles, clinical application and research methods. Prerequisites: Chem 190, 122. Three lectures, two labs. (5W) Greenwood

198. Undergraduate Research Problems. Credit arranged. (F, W, Sp) Staff

199. Undergraduate Thesis. (1F, 1W, 1Sp) Staff

201. Quantum Chemistry. Quantum chemistry with emphasis on valence bond and molecular orbital calculations. Prerequisites: Chem 106, Math 110. Three lectures. (3F) Boyd, Moore, Redington


203. Chemical Kinetics. Theory of reaction rates with application to current research problems. Prerequisite: Chem 201. Three lectures. (3Sp) Boyd, Moore, Redington

204. Chemical Thermodynamics and Statistical Mechanics. Advanced chemical thermodynamics from the standpoint of Gibbs. Prerequisite: Chem 106, Math 110. Three lectures. (3F) Boyd

205. Chemical Thermodynamics and Statistical Mechanics. Introduction to statistical mechanics. Prerequisites: Chem 201, 204. Three lectures. (3F) Boyd

206. Chemical Thermodynamics and Statistical Mechanics. Applications of thermodynamics and statistical mechanics to chemical problems. Prerequisites: Chem 206, (3Sp) Boyd

209. Special Topics in Physical Chemistry. Prerequisites: Chem 203, Math. 110. (3) Staff


229. Theoretical Organic Chemistry. Application of kinetics, thermodynamics and simple quantum mechanics to problems of organic chemistry. Prerequisite: Chem 228. Three lectures. (3Sp) Smith

233. Special Topics in Organic Chemistry. Current topics in organic chemistry. Prerequisites: Chem 227. Three lectures. (3Sp) Staff

234. Chemistry of Natural Products. Alkaloids, steroids and terpenes with emphasis on biosynthesis. Prerequisite: Chem 227. Three lectures. (3F) Stérmittz

250. Advanced Inorganic Chemistry. Modern topics and theories in inorganic chemistry. Prerequisites: Chem 106, 150. Three lectures. (3W) Hobrock

251. Coordination Chemistry. Theory of the coordinated bond and inorganic reaction mechanism. Prerequisite: Chem 250. Three lectures. (3Sp) Hobrock

*Taught 1966-67

**Taught 1966-68
260. Graduate Seminar. (1F, 1W, 1Sp) Staff


274. Special Topics in Analytical Chemistry. Prerequisites: Chem 106, 152, 153. (3) Staff

275. Toxicology. Effect of selected chemical compounds on living organisms. Prerequisites: Chem 190, 195, 122. Three lectures, two labs. (5Sp) Greenwood


288. Special Topics in Biochemistry. Three lectures. (3) Staff

289. Animal Metabolism. Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in blood, urine and other secretions and excretions when indicated. Credit arranged. (F, W, Sp) Greenwood

295. Enzymes. Enzymes and their functions in plants and animals. Prerequisites: Chem 106, 192. Three lectures. (3W) Tu, Van Orden

296. Enzyme Chemistry Laboratory. The experimental methods of enzyme chemistry including the purification, assay, and isolation of enzymes followed by a study of their kinetics, activity and other properties. Prerequisites: Chem 106, 194. Alternate years. Two labs. (2Sp) Tu, Van Orden

298. Graduate Research. Credit arranged (F, W, Sp) Staff

Department of Geology

Head: Professor J. Stewart Williams
Office in Library 239

Associate Professors Clyde T. Hardy, Donald R. Olsen.

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. (6F, W, Sp) Hardy

4. Historical Geology. Physical history of the earth and the development of life as indicated by the geologic record. (5F, W, Sp) 
      Hardy

5. Minerals and Rocks. Identification of common minerals and rocks. Prerequisite: Geology 1 or 3. (3W) 
      Olsen

31. Physical Science. Elements of geology integrated with astronomy, chemistry, mathematics, and physics for use in interpreting human experience. Designed to help fill the exact science group requirements. (3F, W) 
      Olsen

101. Mineralogy. Identification of minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geology 3 and Chemistry 10, 11. (5F) 
      Olsen

102. Optical Mineralogy and Petrography. Determination of minerals by using the petrographic microscope. Classification of igneous rocks. Prerequisites: Geology 101 and Physics 19. (3W) 
      Olsen

103. Engineering Geology. Application of geology to engineering problems. (3Sp) 
      Williams

106. Invertebrate Paleontology. Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geology 4 and Zoology 3. (5F) 
      Williams

108. Stratigraphy and Sedimentation. Prerequisite: Geology 3. (5W) 
      Hardy

110. Structural Geology. Prerequisite: Geology 3. (5F) 
      Hardy

      Hardy

113. Economic Geology. Geologic occurrence of metallic and non-metallic mineral deposits. Prerequisites: Geology 101, 110. (3Sp) 
      Olsen

114. Geologic Field Methods. Preparation of geologic and topographic maps utilising the plane table. Measurement of stratigraphic sections. Survey of geophysical techniques. Prerequisites: Geology 3 and Civil Engineering 81. (3Sp) 
      Hardy

115. Surficial Geology. Processes active on surface of earth, unconsolidated deposits, and geomorphology. Recent geologic events. For majors in Forest and Range Management, Engineering, and Agronomy. Prerequisite: Elementary geology. (5F) 
      Williams

      Staff

117. Ground-Water Geology. Geologic conditions that control the occurrence and purity of ground water with special reference to western United States. Prerequisite: Geology 3. (4W) 
      Williams

118. Geologic Field Course. (8Su) 
      Staff

210. Graduate Seminar. (2-5 F, W, Sp) 
      Staff

212. Stratigraphic Paleontology. (SF) 
      Williams

213. Paleozoic Stratigraphy. (3W) 
      Williams

214. Mesozoic and Cenozoic Stratigraphy. (5F) 
      Williams

215. Regional Tectonics. (3W) 
      Hardy

216. Petrography. (5Sp) 
      Olsen

217. Petrogenesis. (3F) 
      Olsen

      Staff

Department of Mathematics

Head: Professor Neville C. Hunsaker
Office in Engineering C-327


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 employ-
ment 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 BS 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 fifteen credit hours of upper division Mathematics selected from other courses meeting departmental approval.

A department-approved teaching minor must include Mathematics 98 and 150, and should include Mathematics 120, 124, 175.

All students majoring in Mathematics must have had Plane and Solid Geometry. Plane Geometry is a prerequisite for all university mathematics except Mathematics 20, 30, 34, 35 and 60.

If a student completes both Mathematics 30, and 34, credit will be allowed for only one of these courses.

All courses to be used as prerequisites must be completed with a grade of "C" or better.

**Mathematics Courses**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Elementary Mathematical Concepts</td>
<td>For prospective teachers in the elementary schools.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>30</td>
<td>Elements of Mathematics</td>
<td>A survey course to help fill the science group requirements. Enough training in intermediate algebra is included to allow a student to continue with the study of college algebra.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>33</td>
<td>Solid Geometry</td>
<td>Prerequisite: Math 34 or equivalent.</td>
<td>(2Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>34</td>
<td>Introduction to College Algebra</td>
<td>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.</td>
<td>(3F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>35</td>
<td>College Algebra</td>
<td>Prerequisite: 34.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>40</td>
<td>Introduction to Probability Theory and Statistics</td>
<td>Prerequisite: 35.</td>
<td>(3Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>44</td>
<td>Plane Trigonometry</td>
<td>Prerequisite: 36.</td>
<td>(5F)</td>
<td>Staff</td>
</tr>
<tr>
<td>60</td>
<td>Mathematics of Finance</td>
<td></td>
<td>(3Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>97</td>
<td>Analytic Geometry and Calculus</td>
<td>Prerequisite: 44 or 46.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>98</td>
<td>Analytic Geometry and Calculus</td>
<td>Prerequisite: 97.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>99</td>
<td>Integral Calculus</td>
<td>Prerequisite: 98.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>110</td>
<td>Calculus and Differential Equations</td>
<td>Prerequisite: 99.</td>
<td>(5F, W, Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>116</td>
<td>Modern Algebra</td>
<td>Prerequisite: 99.</td>
<td>(3F)</td>
<td>Staff</td>
</tr>
<tr>
<td>117</td>
<td>Modern Algebra</td>
<td>Prerequisite: 116.</td>
<td>(3W)</td>
<td>Staff</td>
</tr>
<tr>
<td>118</td>
<td>Modern Algebra</td>
<td>Prerequisite: 117.</td>
<td>(3Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>119</td>
<td>Theory of Equations</td>
<td>Prerequisite: 99.</td>
<td>(3W)</td>
<td>Staff</td>
</tr>
<tr>
<td>120</td>
<td>Modern Geometry</td>
<td>Prerequisite: 98.</td>
<td>(3)</td>
<td>Staff</td>
</tr>
<tr>
<td>122</td>
<td>Ordinary Differential Equations</td>
<td>Prerequisite: 110.</td>
<td>(3)</td>
<td>Staff</td>
</tr>
<tr>
<td>123</td>
<td>Number Theory</td>
<td>Prerequisite: 99.</td>
<td>(3)</td>
<td>Staff</td>
</tr>
<tr>
<td>124</td>
<td>Foundations of Mathematics</td>
<td>Prerequisite: 98.</td>
<td>(3)</td>
<td>Staff</td>
</tr>
<tr>
<td>126</td>
<td>Numerical Analysis</td>
<td>Prerequisite: 99 and knowledge of Fortran programming.</td>
<td>(3F)</td>
<td>Staff</td>
</tr>
<tr>
<td>127</td>
<td>Numerical Analysis</td>
<td>Prerequisite: 126.</td>
<td>(3W)</td>
<td>Staff</td>
</tr>
<tr>
<td>128</td>
<td>Numerical Analysis</td>
<td>Prerequisite: 127.</td>
<td>(3Sp)</td>
<td>Staff</td>
</tr>
<tr>
<td>130</td>
<td>Advanced Calculus</td>
<td>Prerequisite: 110.</td>
<td>(3F)</td>
<td>Staff</td>
</tr>
</tbody>
</table>
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. (SW) Staff

163. Mathematics of Statistics. Prerequisite: 162. (SSp) Staff

166. Sequential Analysis and Control of Quality of Output in Manufacturing. (SSp) Staff

167. Statistical Reading and Reports. (SSp) Staff

*Not offered 1965-66
Department of

Physics

Head: Professor John K. Wood
Office in Engineering 154

Visiting Professor J. Wm. DuMond; Associate Professors Jack E. Chate-lain, W. Farrell Edwards; Assistant Professors Jay O. Jensen, Richard L. Knight, V. Gordon Lind, John J. Merrill, Akeley Miller.

Bachelor of Science Degree. Requirements for a Physics major: Fifty credits, of which thirty-five 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; Physics 40, 41, 42 (if offered) or Physics 20.

Sophomore Year: Physics 21, 22, 23, 50; Mathematics 98, 99, 110; German, Russian, or other group electives.

Junior Year: Physics 153, 154, 155, 181, 182, 183; 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 163, 154, 155 or Physics 175, 176, 177. Nine credits of upper division Physics courses including 122 and 130 may be substituted on departmental approval.

Teaching Major: For a teaching major in Physics, a student should complete the following program: Physics 153, 154, 155, 181, 182 or 175, 176, 177, 181, 182 with prerequisites; Math through 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, Russian and "others"; comprehensive examination any time prior to one year be-
fore 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. (6F, W, Sp) Staff

10. Astronomy. An introduction to the solar and stellar systems in terms of modern methods and theories. No prerequisites. (3F, W, Sp)

17, 18, 19. General Physics. Mechanics, electricity, magnetism, heat, light, sound, atomic and nuclear physics for non-science majors. Prerequisite: Math 35 or Math 44 or 46. Recommended: Math 97. Should be taken in sequence except with permission of instructor. Two lectures, three recitations and one lab per week. (6F, 6W, 6Sp) 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. (6F, 6W, 6Sp) Staff

23. Quantum and Statistical Physics. Further development of physical phenomena due to the quantum and/or statistical nature of matter. Prerequisite: Physics 22. (3Sp) Staff

40. Introductory Mechanics I. Introduction to Newtonian Mechanics with brief development of elementary calculus and vector algebra. Prerequisite: Permission of the instructor. (8F) Merrill

41. Introductory Mechanics II. Development of concepts of energy and momentum, both linear and rotational, and the introduction of conservation laws. Further development of vector and calculus notations. Prerequisite: Physics 40. (3W) Merrill

42. Energy Transfer. Wave motion, sound, and heat. Prerequisite: Physics 41. (3Sp) Merrill

50. Mechanics Laboratory. Experiments on conservation of momentum and energy oscillatory motion, heat transfer, and gas laws. Prerequisite: Student must be concurrently registered in Physics 42. (1Sp) Miller

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. (6Sp) 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 structure, molecular physics, solid state physics, X-rays and nuclear physics. Prerequisite: Physics 155 or 177. Three lectures, one recitation. (4F, W, Sp) 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, Sp) 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


160, 161, 162. Thermal Physics. A study of theoretical models devised to correspond with the observed behavior of matter in bulk in terms of heat and energy. (3F, 3W, 3Sp)

164, 167, 168. Wave Theory and Optics. Three-quarter sequence covering optics and related topics. Emphasis on wave motion and diffraction phenomena; also geometrical optics, aberrations, interference, polarization, X-ray optics, and atomic spectra. Three lectures. (3F, 3W, 3Sp) Staff

175, 176, 177. Electricity and Magnetism. Electrostatics, magnetostatics, DC and AC circuits, electromagnetism, and electromagnetic theory. Use of the calculus and differential equations. (3F, 3W, 3Sp) Miller

181. Mechanics Laboratory. A one quarter course including experiments on linear and non-linear oscillatory motion with and without coupling and experiments on elastic behavior of bodies. Makes use of calculus and some differential equations. Prerequisite: concurrent or previous registration in Physics 153. (1F) Staff

182. Electricity and Magnetism Laboratory. A one quarter course including experiments with direct and alternating current bridges, experiments to examine the mechanical and
electrical details of galvanometer and other meter behavior, and experiments concerning feedback and filter and other transfer properties. Makes use of calculus and some differential equations. Prerequisite: concurrent or previous registration in Physics 175. (1W) Staff

183. Atomic Physics Laboratory. A one quarter course including experiments in Atomic Physics such as the measurement of electronic charge by the Millikan oil drop experiment and the Franck and Hertz experiment. Makes use of calculus and some differential equations. Prerequisite: concurrent or previous registration in Physics 153. (1Sp) Staff

184. Optics Laboratory. A one quarter course including advanced experimental work in optics such as refraction in inhomogeneous media, diffraction, polarization, photometry, spectra, information retrieval. Prerequisite: concurrent or previous registration in Physics 166. (1W) Staff

188. Special Problems in Experimental Physics. A laboratory course to give the advanced student experience with precision instruments and their use in physics. 1 to 3 per quarter. (F, W, Sp) Staff

193, 194, 195. Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in physics. Students receive credit for course by making reports. (1F, 1W, 1Sp) Staff

196, 197, 198. Selected Reading in Physics. (1F, 1W, 1Sp) Staff

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.


214. Soil Physics. (See Agronomy 214.)

220, 221, 222. Atomic Spectra, Molecular Spectra, and Spectrographic Measurements. (3F, 3W, 3Sp) Staff

230, 231, 232. Nuclear Physics. (8F, 3W, 3Sp) Staff

250. Research in Physics. Credit arranged. (F, W, Sp) Staff

260, 261, 262. Thermodynamics, Kinetic Theory, Statistical Thermodynamics. (3F, 3W, 3Sp) Chatelain

276, 271, 272. Quantum Field Theory. (8F, 3W, 3Sp) Chatelain

275. Relativity and Cosmology. A special theory of relativity developed from the Einstein postulates. The historical and experimental basis for the theory will be discussed, and necessary mathematical techniques will be developed with applications to relativistic mechanics. (3F)

276. Relativity and Cosmology. The general theory of relativity developed from the principle of equivalence. The Riemann-Christoffel curvature tensor, the field equations, and the known rigorous solutions will be discussed. (3W)

277. Relativity and Cosmology. Equations of motion in the general theory, experimental tests of the theory, possible unified field theories, and applications to cosmology. (3Sp)

285, 286, 287. Introductory Quantum Mechanics. Prerequisite: Advanced Calculus. (3F, 3W, 3Sp) Staff

290, 291, 292. Theoretical Mechanics. (3F, 3W, 3Sp) Staff

293, 294, 295. Graduate Seminar in Physics. Credit Arranged. (F, W, Sp) Staff

296, 297, 298. Theoretical Electricity and Magnetism. (3F, 3W, 3Sp) Staff
Department of Zoology

(Zoology, Entomology, Physiology, Pre-Dentistry, Pre-Medicine, Nursing)

Head: Professor Datus M. Hammond
Office in Forestry and Zoology 117


Bachelor of Science Degree. For a major in Zoology the following courses must be taken: Zoology 3, 4, 107, 112, 118, and 131; Physiology 121 and 122, or 130 and either 151 or 104; Wildlife Resources 160, or any additional upper division course in Zoology; Botany 24, and one of 25, 30, or 120; Mathematics 35 and 46; Physics 17, 18, and 19; Chemistry 3, 4, 5, 121, and 122; and 15 hours of a modern language. The following courses are recommended: Entomology 13, Bacteriology 10 or 70 and 71, a second year of a modern language, Philosophy 50 (Logic), Philosophy 160 (Philosophy of Science), English 34, 35, 36 or any upper division literature course; additional courses in history, political science, and fine arts. Students interested in experimental aspects of zoology should elect more mathematics (97, 98, 99, and 110), more chemistry (115 and 190) and applied statistics (131 and 132).

For a pre-medical or pre-dental major in Zoology, the listed pre-

medical or pre-dental requirements must be completed, and in addition the following courses must be taken: Zoology 107, 127 or 128, 131, and any one of the following courses: Ent 115, Physiol 130, Zool 116 or 212.

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. A study of basic life principles as illustrated in both animals and plants, including microbes. Four lectures, one recitation, and one 2-hour lab. (6F, W, Sp, Su) Gunnell, Linford

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. (6F, 6W, 6Sp) Staff

10. Invertebrate Zoology. The more important phyla of invertebrates, with some consideration of the local fauna. Prerequisites: Zoology 3. Three lectures, two labs. (6Sp) Staff

11. Comparative Anatomy. Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zoology 4 or equivalent. Three lectures, two labs. (6W) Dixon

12. 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. (4Sp) Dixon

13. Evolution. A general consideration of the biological principles of evolution as it applies to plants, animals and man. Prerequisite: Biology 1, or a good high school course in biology. Three lectures. (8W) Gunnell

14. Population Genetics. A study of the flow of genes in undisturbed populations, the outcome of selective forces in populations, and the role of migration, mutation, and chance in altering the genetic makeup of populations. Prerequisites: Zoology 112 and Applied Statistics 181, 182. Three lectures, one lab. (4F) Staff

15. Ichthyology. Ecology, classification, and life histories of native and introduced fishes. Three lectures. (8W) Sigler

16. Ichthyology Laboratory. Laboratory study of fishes. Must accompany or follow Zoology 115. Two labs. (2W) Sigler

19. Special Problems. Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W, Sp) Staff
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205. Orientation for Graduate Students. Introduction to procedures in graduate study; qualifying examinations, scientific method, selection of problem, becoming acquainted with literature, organization and writing of thesis and final examination. Required of all graduate students in Zoology, Entomology, Physiology. (1F) Staff

207. Theoretical Biology. A critical study of modern biological thought. (3W) Sanders Staff

212. Biochemical Genetics. Concepts of genetic function at the chemical and molecular level, with emphasis on current literature. Prerequisites: Zoology 112, Chemistry 122; recommended, Chemistry 190. Three lectures. (3W) Simmons Staff

213. Biochemical Genetics Laboratory. Experimental methods used in research in biochemical genetics. Must accompany or follow Zoology 212. Two labs. (2W) Simmons Staff

214. Advanced Genetics. Intensive study of heredity and variation with emphasis on current research. Prerequisite: Zoology 112. (3Sp) Staff

230. 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, 1Sp) Gardner, Simmons, Bowman

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. (5W) Staff

233. Zoogeography. Principles governing the distribution of animals, with emphasis on terrestrial vertebrates, and the history of the biota of western North America from the beginning of the Cenozoic era. (3W) Dixon Staff

235. Protozoology. The protozoa, with emphasis on parasitic forms, and on the methods of studying the protozoa. Consideration is also given to free-living protozoa and to classification, morphology, physiology, and reproduction of the protozoa in general. Two lectures, two labs. (4W) Hammond Staff

236. Advanced Parasitology. Detailed study of certain parasitic protozoa and nematids, with emphasis on current research. Prerequisite: Zoology 116. (2Sp) Hammond Staff

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science or PhD degree. Credit arranged. (F, W, Sp) Staff

251, 252. 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. (1F, 1Sp) 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, 1Sp) 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, 1Sp) Nye

Entomology

Bachelor of Science Degree. For a major in Entomology, the following courses are required: Zoology 3, 4, 107, 112, 131; Entomology 13, 103, 104, 111, 112, 108 or 115; Botany 24, 25, 30, 130 (Botany 140 or Zoology 116 may be substituted with permission); Chemistry 3, 4, 5, (10, 11, 12 allowed only in some specialties) 121, 122; Physiology 4; Mathematics 35; Wildlife Resources 160. The following are recommended: Entomology 21, 120, 230; Agronomy 118; Applied Statistics 131, 132; English 111, Horticulture 131; Physics 6. Students planning graduate work are advised to study a foreign language and take Chemistry series 3, 4, 5, 121, 122.

Entomology Courses

13. General Entomology. Fundamental knowledge about insects—where they live, what they do, how they develop and behave; also structure, function, relationship to the environment and principles of insect control are considered. Students learn how to collect and preserve insects and to identify the major groups of these. This course is intended to serve as a foundation for other courses in Entomology and provide an introduction to the subject for those preparing to teach biology and for students in Agriculture and Wildlife Resources. (5Sp) Staff

*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. (2Sp) Nye

**103. Systematic Entomology.** Classification of insects. Insect collection required. Prerequisite: Entomology 13. One lecture, one lab and field collecting. (SF) Hanson

**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. (SW) Hanson

**105. Forest Entomology.** Ecology, life history, identification and economic importance of major forest insect species. Beneficial and harmful insects, and general problems of forest insect control are discussed. Two lectures, two labs. (SF) 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. (SF) 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. (SF) Davis

**111. Insect Morphology.** Structure of insects, including external and internal anatomy. Prerequisite: Entomology 13. Three lectures. Two labs. (SF) Staff

**112. Insect Physiology.** Function of the organ systems of insects. Prerequisite: Entomology 111. Three lectures, two labs. (SW) Staff

**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. (SF) Hanson

**120. Insect Pollination in Relation to Agriculture.** Pollinating insects in agriculture, including beekeeping as related to crop pollination, utilization of native pollinating insects, and special problems in the pollination of many commercial crops. (SW) Bohart

**138. Aquatic Entomology.** Identification, distribution, life histories and adaptations of aquatic insects, with particular reference to local streams and lakes. Two lectures, one lab. (SW) Hanson

**210. Special Problems.** Individual study under staff guidance. Prerequisite: Entomology 13, 103, 108. Credit arranged. (F, W, Sp) 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 180. Two lectures, one lab. (SW) 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. (SW) Davis

**233. Aphidology.** Morphology, biology and taxonomy of aphids. Prerequisite: Entomology 103. (SF) Knowlton

**250. Research and Thesis.** For research connected with problem undertaken for partial fulfillment of requirements for Master of Science or PhD degree. Credit arranged. (F, W, Sp) Staff

**262, 263. Seminar in Entomology.** Required of all graduate students in Entomology each winter and spring quarter while in residence. Seniors in Entomology and others interested may participate with the permission of the instructor. (W, Sp) Staff

**285. Zoology.**

**Physiology**

A major in Physiology must satisfy the Zoology requirements, and in addition complete Mathematics 110.

A minor in Physiology must complete eighteen hours of courses approved by the division of Physiology.

**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. Five lectures, one lab. (SF, W, Sp) Bahl

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. (F, W, Sp) Linford

*Taught 1965-66

**Taught 1966-67
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. (6Sp)
Eills

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)

130. Cellular Physiology. A study of physiological functions at the cellular level. Prerequisites: Physiology 4 or its equivalent, Chemistry 121 and 122, and Physics 17, 18 and 19 or equivalent. Three lectures, two labs. (6W)
Sanders

141. Endocrinology. A study of the ductless glands and their secretions. Emphasis is placed on the action of these hormones on growth, metabolism, and adaptation of animals to changes in their internal and external environments. Prerequisites: Zoology 3, 4, Physiology 4, and a course in organic chemistry. Three lectures, one lab. (4F)
Ellis

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

151. Comparative Physiology. A comparative study of organ function in the animal kingdom. Prerequisite: Physiology 121, 122 or 130. Three lectures, two labs. (5Sp)
Sanders

261. Physiology of Response. 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, 1Sp)
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, 1Sp)
Staff

291. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirements for Master of Science or PhD degree. Credit arranged. (F, W, Sp)
Staff

Pre-Dentistry

Students planning to enter dentistry may take the necessary courses in the College of Science to satisfy requirements for admission to any school of dentistry in the United States.

Suggested pre-dental schedule:

<table>
<thead>
<tr>
<th>FRESHMAN</th>
<th>F</th>
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<tbody>
<tr>
<td>Chemistry 3, 4, 5</td>
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<tr>
<td>Mathematics 34, 35, 44 or 46</td>
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<tr>
<td>English 1, 2, 3</td>
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<td>3</td>
<td>3</td>
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<tr>
<td>Air Sci, Military Sci, or P E</td>
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<td>1</td>
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<tr>
<td>Electives (optional)</td>
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Total | 16 | 16 | 17 |

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<tr>
<td>Chemistry 3, 4</td>
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<td>Physics 17, 18, 19</td>
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<tr>
<td>Electives (optional)</td>
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Total | 17 | 17 | 17 |

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<th>JUNIOR2</th>
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<td>Chemistry 121, 122, 123</td>
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<tr>
<td>Zoology 118 or 119</td>
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<tr>
<td>Electives</td>
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</table>

Total | 17 | 17 | 17 |

Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

Students planning to receive a BS degree in a combined curriculum (three years here and one year in a dental school) must complete a minimum of 141 credits of pre-professional work, including the USU graduation requirements.

1Military Science or Air Science would be two credits each quarter.

2Students 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.
Pre-Medicine

The college of Science offers the courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

Suggested pre-medical schedule:

**FRESHMAN**

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>English 1, 2, 3</td>
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<td>Chem 3, 4, 5</td>
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<td>Math 35, 46</td>
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<td>Air Sci, Military Sci, or P E</td>
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</tr>
<tr>
<td>Electives</td>
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<td><strong>Total</strong></td>
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**SOPHOMORE**

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<td>Zoology 3, 4</td>
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<td>Physics 17, 18, 19</td>
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<td><strong>Total</strong></td>
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1Foreign Language strongly recommended.

**JUNIOR**

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<tbody>
<tr>
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</tr>
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<td>Zoology 112</td>
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<td>Zoology 118</td>
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</tr>
<tr>
<td>Chem 115</td>
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</tr>
<tr>
<td>Electives</td>
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<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

Electives should be chosen from the Humanities, Arts and Social Sciences. Some medical schools require or recommend Comparative Anatomy.

Students interested in graduation from USU before attending medical school may major in any subject.

If interested in a pre-osteopathic program students should consult the pre-medical adviser.

If planning to receive a BS degree in a combined curriculum (three years 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.
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J. Stewart Williams, Dean
Office in Library 239 (South Entrance)

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 eight resident colleges of the University. The librarian is an ex-officio member. Members of the Council are nominated by the Faculty Senate and appointed by the President to serve four-year terms, two to be appointed each year.

The present Graduate Council is listed below with the year in which each member’s term of office expires: College of Agriculture, James A. Bennett, 1965; College of Business and Social Sciences, Brigham D. Madsen, 1967; College of Education, Terrance E. Hatch, 1968; College of Engineering, Bruce O. Watkins, 1968; College of Forest, Range and Wildlife Management, L. A. Stoddart, 1965; College of Family Life, Norma H. Compton, 1967; College of Humanities and Arts, Hubert W. Smith, 1966; College of Science, W. S. Boyle, 1966.

There are 11 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, Master of Arts, Master of Fine Arts, Doctor of Education and Doctor of Philosophy.

A graduate with a Bachelor’s degree from USU or from any other accredited college or university may be admitted to the School of Graduate Studies. A “B” average is necessary for admission to a degree program. 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 a topic within the field of his major subject, which must represent from nine to fifteen hours of the credit presented for the Master’s degree, and as much as forty-five hours of credit for the Doctor’s degree. The thesis must be a contribution to the field of knowledge, based upon the student’s own research or a treatment and presentation of known subject matter from a new point of view. 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. A Doctoral candidate pays a fee of $20.00 to have his dissertation microfilmed. This film is produced by and registered with University Microfilms, Ann Arbor, Michigan, who also publish an abstract.

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.” In certain specialized programs, no thesis or “Plan B” papers are required.

If a student is working under “Plan B” in General Agriculture, the Dean of the College of Agriculture will select a major professor to be the chairman of the student’s supervisory committee. This program must include a minimum of six credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

Credit Load. Maximum load for full-time graduate students is sixteen credits. Maximum for assistants engaged in teaching or research is twelve credits, except that students assisting in research which results in their thesis or dissertation may register for the full load, if such registration includes at least four credits of research or thesis.

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.

Degrees of

Master of Arts, Science

The Master of Arts and the Master of Science degrees are offered in most of the basic biological, physical, and social sciences and in various educational, industrial, and professional divisions of the University. Specific departments in which the Master's degree is given, together with the courses provided by the departments, may be determined by consulting the departmental statements in this catalog.

Requirements. The program for the Master's degree must include:

1. At least 27 residence credits exclusive of thesis; 9 credits taken at off-campus residence centers may count toward this requirement with the approval of the dean concerned.
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;
4. A thesis with nine to fifteen credits, or thesis alternate;
5. For the Master of Arts degree, two years of a foreign language, or equivalent proficiency in such a language as proved by testing.

Final Examination. A candidate for the Master's degree is required to pass a comprehensive final examination on the subjects of graduate study and on his thesis, if one is part of his program. This examination may be oral or written or both as the committee decides, and is open to all faculty members and officials of the School of Graduate Studies.

Arrangements for the time and place of the examination are made by the dean of the School of Graduate Studies. A member of the advisory and examining committee, other than the major professor, or other representative of the Graduate Council, is appointed to act as chairman of the examination and submits to the Graduate 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 1.

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. The total of all off-campus credit may not exceed eighteen hours, exclusive of thesis. All extension courses for which graduate credit is sought must be regularly registered for through the School of Graduate Studies, and must have the sanction of the head of the department in which graduate work is being done. Credit toward a Master's degree is not granted for home study (correspondence) courses.

Transfer Credit. A maximum of nine quarter credits of graduate work satisfactorily completed at another approved Graduate School
may be allowed toward a Master's degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the committee.

**Degree of**

**Master of Education**

*Degree Areas*: A course of study leading to the Master of Education degree is offered in the following areas: Elementary School Teaching, Elementary School Administration, Elementary School Supervision, Secondary School Teaching, Secondary School Administration, Secondary School Supervision, and Special Education.

The course of study leading to the Master of Education degree in each of the above areas has for its purpose the preparation of thoroughly prepared teachers, supervisors, and administrators. It provides a broad foundation in the field of education and in the particular area of specialization, and differs from the Master of Science degree by providing more flexible requirements to meet specific needs. This degree emphasizes a proficiency in the interpretation and application of research.

The requirements for the Master of Education degree include: (1) At least 48 credits beyond the Bachelor's degree, subject to the same limitations of off-campus course credit, transfer credit and time limit as the Master of Science degree; (2) General culture courses in the Humanities, Sciences, and Social Sciences; (3) Specified courses in each of seven areas of the field of education; (4) Possession of a teaching, administrative, supervisory or other appropriate state school certificate; (5) Evidence of potential success as a teacher or successful teaching experience.

**Degree of**

**Master of 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 overall record, including course work, the Master's examinations and the Master's Paper, represent creditable accomplishment. Candidates for this degree should have had successful industrial, supervisory, administrative, or teaching experience.

**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**

**Master of Fine Arts**

This is a specialized professional degree. In 1959 the College Art Association of America approved the MFA, rather than the PhD, as the terminal degree in the Studio Arts. Whereas an exceptional student devoting full time might qualify after four quarters, it is generally considered to require an average of two years to produce enough art works of sufficient quality to be recommended for this degree. The accumulation of credit hours, and the number of quarters in residence are not major factors in granting the MFA degree. The emphasis is clearly on the productive demonstration of high artistic and technical achievement by students with considerable creative abilities. Only students whose
previous art works indicate a promising potential in art will be accepted for admission to the MFA program.

Because this degree is highly individualized, the student should consult the department or his graduate committee for more detailed information on requirements.

**Specialist in**

Educational Administration (Six-Year Program)

A new six-year program in the College of Education terminates in the Diploma in Educational Administration. Requirements include: (1) a Master's degree or equivalent; (2) a total of 45 quarter hours—27 on the Logan campus, of which 15 hours must be taken in one quarter; (3) at least 12 quarter hours of credit in Secondary Education for candidates with previous preparation in Elementary Education and a minimum of 12 quarter hours credit in Elementary Education for those previously prepared in Secondary Education; (4) written comprehensive examination covering the work taken; and (5) qualifications for Utah State Department of Public Instruction General Administration Certificate.

**Degree of**

Doctor of Education

The degree of Doctor of Education is designed especially to prepare for leadership and expert service in the field of Education. Requirements for this degree include the development of competence in an area of specialization in Education plus a thorough development of skills and knowledge of the broad field of Education and in a field supplementary to professional education.

The minimum requirements for the Doctor of Education degree are: (1) a Master's degree or equivalent. (2) A program of at least 90 credits of approved graduate study beyond the Master's degree. (3) An acceptable dissertation for which a maximum of 18 credits may be given. (4) Four quarters of residence at Utah State University, three of which must be in consecutive sequence (minimum 12 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 or the head of the department in which the degree is to be taken.

**Degree of**

Doctor of Philosophy

The degree of Doctor of Philosophy (PhD) is awarded by Utah State University in recognition of high attainment and productive scholarship in a specific field of learning.

**Majors Offered.** The Doctor of Philosophy degree is offered in: Agricultural and Irrigation Engineering, Agronomy, Animal Husbandry, Nutrition and Biochemistry, Botany, Chemistry, Civil Engineering, Clothing and Textiles, Electrical Engineering, Food Science and Technology, Forest Management, Horticulture, Mechanical Engineering, Physics, Plant Nutrition and Biochemistry, Psychology, Range Management, Sociology, Toxicology, Wildlife Resources, Zoology.

Admission to School of Graduate Studies to work toward the degree of Doctor of Philosophy is obtained in the same manner as for the Master's degree. Qualifying exam-
inations are similarly required, and
the program is likewise directed
by a supervisory committee.

Requirements. The program for
the Doctor of Philosophy degree
must include: (1) Three years of
full-time graduate study above the
Bachelor's degree. If the student
has a Master's degree, then two
years will be required. The stu-
dent's supervisory committee may
recommend that part of this pro-
gram 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 prob-
lem on which a dissertation will be
presented. Credits for this disser-
tation will generally not exceed
45, and work on the dissertation
should ordinarily occupy most of
the third year, but may be carried
on with course work throughout the
program.

Language Requirement. A read-
ing knowledge of at least one
modern language other than Eng-
lish is required in the PhD pro-
gram. Normally one of the lan-
guages of global scientific or schol-
arly communication—French, Ger-
man, Russian, Spanish—will be
selected according to the candid-
ate's particular need. The require-
ment of a second modern foreign
language is optional with the de-
partment in which the major is
taken.

Testing and certification of lan-
guage proficiency will be performed
by the faculty of the Department
of Languages on the basis of
courses completed and/or perform-
ance in language proficiency exams
offered to eligible applicants semi-
annually (in November and April).
The required language proficiency
should be demonstrated before the
beginning of the third year of
graduate work.

Comprehensive Examination and
Candidacy. Written and oral exami-
inations are conducted by the
supervisory committee and the de-
partment concerned, usually in the
last quarter of the second year of
work, to determine fitness for ad-
mission to candidacy for the degree
of Doctor of Philosophy.

Dissertation. A completed disser-
tation approved by the department
must be presented to the supervi-
sory committee not later than April
15 of the year in which the student
would graduate. The dissertation
must show ability to do critical and
independent research. It must pre-
sent a contribution to knowledge in
scholarly fashion.

Final Examination. The final ex-
amination in defense of dissertation
will be conducted by the supervisory
committee not later than May 1 if
the student is to graduate at the
following commencement.

Teaching and Research
Assistantships

A number of teaching and re-
search assistantships in various de-
partments of the University are
available each year to graduate
students. Teaching assistantships
carry a stipend of $1,000 to $2,000
for one-third to one-half teaching
service on a nine-month basis. Re-
umeration for research assistant-
ships may vary from $900 to $2,400,
depending upon the time of service
involved. Generally assistantships
are arranged so that the student
may complete 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 Civil Engineering, Chemistry, 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. Tuition and fees are paid.

Cooperative Fellowships. USU participates in a Cooperative Fellowships program with the National Science Foundation. These fellowships carry a stipend of $2,400 for first-year students, $2,600 for second-year students, and $2,800 for terminal-year students with an allowance of $500 for each dependent. Stipends are reduced proportionately for nine-month rather than full-year tenure. These stipends may be supplemented up to $1,000 per year. Deadline for application is November 1, and awards are made March 15.

Other fellowships available include those of the National Institute of Health in Genetics and other biological sciences, National Science Foundation Traineeships in Engineering and the Physical Sciences, and those provided by the National Aeronautics and Space Administration in space-related departments.

Tuition Scholarships

A number of tuition scholarships are available to beginning graduate students who are residents of Utah. Also, there are a limited number of waivers of out-of-state tuition in recognition of excellent scholarship. Applications should be made to the dean, School of Graduate Studies. (Also, see catalog section on Scholarships.)
Interdepartmental Curriculum in

Food Science and Technology

A graduate program in Food Science and Technology leading to Master of Science or Doctor of Philosophy degree is available to outstanding students. Facilities of the several departments conducting research in Food Science and Technology have been made available in this curriculum to afford students maximum opportunity to gain experience and training. Included in the facilities are an Animal Metabolism Building and equipment for conducting digestion and metabolism studies on large and small animals; several research laboratories are equipped with instruments such as the electron microscope, spectrograph, ultracentrifuge, electrophoresis, gas chromatography, refrigeration, processing pilot plants, respiratory meters, and standard laboratory equipment.

Prerequisites for a major toward an advanced degree should include chemistry (qualitative, quantitative, organic, and elementary biochemistry), mathematics (college algebra, geometry, and a year of calculus for PhD candidate), in addition, appropriate courses in botany, plant pathology, zoology, physiology, bacteriology, public health, English composition, agriculture and foods.

Master of Science Degree Requirements

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science and Technology courses (related to research and specialization)</td>
<td>10</td>
</tr>
<tr>
<td>Advanced Biochemistry and/or Organic Chemistry (225, 226, 227, 234, or 290, 281, 282, 284, 285, 291, 293, 296)</td>
<td>6</td>
</tr>
<tr>
<td>Applied Statistics 131, 132, 215</td>
<td>12</td>
</tr>
<tr>
<td>Physical Chemistry 101</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Chemistry 115</td>
<td>5</td>
</tr>
<tr>
<td>Food Microbiology 120, 121</td>
<td>4</td>
</tr>
<tr>
<td>Research and Thesis (maximum)</td>
<td>16</td>
</tr>
</tbody>
</table>

Doctor of Philosophy Degree Requirements

(Beyond MS degree requirements)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science and Technology (related to research and specialization)</td>
<td>8</td>
</tr>
<tr>
<td>Advanced Biochemistry and/or Organic Chemistry (225, 226, 227, 234 or 281, 282, 284, 285, 287, 295, 298)</td>
<td>12</td>
</tr>
<tr>
<td>Applied Statistics 131, 132, 215, or 220, 233</td>
<td>12</td>
</tr>
<tr>
<td>Physical Chemistry 101 or 104, 105, 106</td>
<td>3 to 9</td>
</tr>
<tr>
<td>Biophysics (140, 141) and/or Radiobiology 150</td>
<td>3 to 9</td>
</tr>
<tr>
<td>Intermediate Quantitative Chemistry 152</td>
<td>7</td>
</tr>
<tr>
<td>and Instrumental Analysis 153</td>
<td></td>
</tr>
<tr>
<td>Food Microbiology 120, 121 or others</td>
<td>4</td>
</tr>
<tr>
<td>Research and Thesis (maximum)</td>
<td>45</td>
</tr>
</tbody>
</table>

Chairmanship for the curriculum rotates biennially; D. K. Salunkhe is chairman for 1965-67.
Facilities of the several departments conducting nutrition and biochemical research have been made available in this curriculum to afford students maximum opportunity to gain experience and training. Included in the facilities are an Animal Metabolism Building and equipment for conducting digestion and metabolism studies on large and small animals and several laboratories equipped with such equipment as an electron microscope, spectrograph, ultracentrifuge, electrophoresis apparatus, gas chromatographic equipment, as well as standard laboratory equipment.

Major problems currently being studied are effects of toxic and non-toxic substances on digestion and metabolism of farm animals, atmospheric pollution, cholesterol metabolism, amino acid metabolism, and other basic physiological processes related to nutrition.

Training in the curriculum is designed as preparation for research in educational institutions, governmental and industrial laboratories, and for college teaching.

Prerequisites for a major in the curriculum should include at least one year or equivalent training in English composition, chemistry (including qualitative analysis, analytical, organic, and biochemistry), mathematics through trigonometry, physics, bacteriology, botany, physiology, and zoology. Any deficient prerequisite work must be completed without graduate credit.

### 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. Electives and Research</td>
<td>17-21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46-49</strong></td>
</tr>
</tbody>
</table>

### Doctorate Degree Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Advanced Nutrition</td>
<td>12</td>
</tr>
<tr>
<td>2. Advanced Biochemistry</td>
<td>15</td>
</tr>
<tr>
<td>3. Statistics</td>
<td>12</td>
</tr>
<tr>
<td>4. Physical Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>5. Physiology, Zoology, Pathology</td>
<td>20</td>
</tr>
<tr>
<td>6. Electives and Research</td>
<td>67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>135</strong></td>
</tr>
</tbody>
</table>

A student shall spend at least two-thirds of his time for the doctorate degree, including thesis, on the major subject. The minor must be in an area of work which can be logically related to that of the department in which the student is doing his major work.

Appropriate minors are Mathematics, Statistics, Chemistry, Physics, Physiology, Genetics and other fields closely related to the major.

For more specific details concerning admissions, requirements, and available scholarships and fellowships write the curriculum chairman.

Chairmanship for the curriculum rotates each two years: chairman for 1965-67 is George E. Stoddard.
Interdepartmental Curriculum in

Plant Nutrition and Biochemistry

Facilities of the various departments conducting research in Plant Nutrition and Biochemistry have been made available for this program. This includes plant growth chambers, laboratories equipped with equipment such as an electron microscope, ultracentrifuge, refrigerated centrifuges, spectrophotometers for ultra violet, infrared visible, fluorescence and recording studies, chromatography equipment, Warburg apparatus, scaling and counting meters, electrophoresis apparatus and general laboratory equipment.

Prerequisites for a major in this curriculum 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></td>
</tr>
<tr>
<td>1 course (121, 224, 226, 226)</td>
<td>3-4</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
</tr>
<tr>
<td>2 courses (190, 191, 192, 281, 282, 295)</td>
<td>6</td>
</tr>
<tr>
<td>Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Zoology</td>
<td></td>
</tr>
<tr>
<td>Biochemical Genetics 212</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 MS program)

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>6-7</td>
</tr>
<tr>
<td>2 courses (224, 225, 226)</td>
<td></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 (190, 191, 192, 281, 282, 295)</td>
<td>3</td>
</tr>
<tr>
<td>Zoology</td>
<td></td>
</tr>
<tr>
<td>Biochemical Genetics 212</td>
<td></td>
</tr>
<tr>
<td>Genetics 112 or Cell Physiology 130</td>
<td>8</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; David R. Walker is chairman for 1965-67.

Interdepartmental Curriculum in

Toxicology

Facilities—The biological laboratory at Bear Lake has a $58,000 physical plant plus $33,000 worth of equipment such as: 2 fathometers, closed circuit underwater television, and boats. A limnological laboratory at the mouth of Logan Canyon is equipped to handle radioactive material; it also has two single-channel gas analyzers, spectrophotometer, refrigerated centrifuge, and complete equipment to do radium\(^{226}\) analysis. Facilities of several departments conducting toxicity studies made available in this curriculum include a small animal metabolism building and a new

\(^{1}\)Students having had 190 and 191 may not take 281 and 282 for credit.
laboratory for investigations in radio chemistry. The types of equipment on the campus include an electron microscope, electrophoresis apparatus, gas chromatographic equipment, spectrophotograph, ultracentrifuge, food technological equipment, autopsy laboratory with appropriate equipment for conducting histopathological studies, and several small buildings for studies on chickens, rats, dogs, and monkeys. Also available on the campus is a computer center for data processing.

Some of the largest projects conducted on the USU campus have been concerned with the effect of fluorine compounds on plants, animals, and man and of ionizing radiation effects on pathogens. The Agricultural Research Services of the U.S. Department of Agriculture has established a branch laboratory for studies relating to the harmful effects of poisonous plants on farm animals.

Training in the toxicology curriculum is designed as a preparation for research in educational institutions, governmental and industrial laboratories, and for university teaching.

Prerequisites for a major in the curriculum should include at least one year in English composition, chemistry (including qualitative analysis, analytical, organic, and biochemistry), food technology, mathematics through trigonometry, physics, bacteriology, botany, physiology, embryology, histology, pathology, and statistics.

Applicants for training in the curriculum may be students with MD, DVM, or BS degrees in Animal Nutrition, General Biology, Bacteriology, Chemistry, Mathematics, Physiology, Zoology, and other closely related fields.

The types of courses which will be required of candidates in this field will depend upon the previous training of the applicant. Students with degrees in Animal Husbandry, Biology, Food Technology, Physiology, Zoology, and other closely related fields will be required to take courses in chemistry, mathematics, statistics, physics, and in the biological sciences to meet requirements for an advanced degree in the curriculum. Students with BS degrees in Chemistry, Mathematics, Physics, and closely related fields will be required to take basic courses in the biological fields.

Chairmanship for the curriculum rotates on a three-year basis; current chairman is Delbert A. Greenwood.
SUMMER QUARTER
Summer Quarter

Ellvert H. Himes, Director
Office in Main 130

Dates: June 13 - August 19, 1966
First Session—June 13-July 15
Second Session—July 18-August 19

The Summer Quarter at Utah State University is more than just the fourth quarter of the University's program of academic and cultural offerings. It is unique in that special programs are devised for early entrance to the University, continuing undergraduate education, and significant professional advancement in certain fields of endeavor.

The Summer Quarter is divided into two sessions of five weeks each as well as providing for numerous short workshops, seminars, clinics, and institutes. Conferences are also held for which credit is offered. High school graduates are encouraged to begin their college career in the Summer Quarter. Those high school students of superior ability may find it most opportune to inaugurate their college program after completing their Junior year. The credit earned can be placed in safe keeping, as it were, awaiting high school graduation. A full quarter's work enables continuing students to complete professional preparation early and thus get into the world of work a year ahead of time. The graduate student may complete requirements for a Master's degree in three summers at less expense.

Numerous challenges and cultural advantages are offered during the Summer Quarter. The Opportunity Theatre with its recitals, concerts, dramas, and workshops, encourages individuals of all ages in creative work and development of various talents in the Fine Arts areas. Additional opportunities for cultural enrichment are included in the Special Lecture Series wherein national figures are presented treating pertinent topics of the day.

The highly qualified resident faculty of Utah State University, is augmented in the summer by distinguished visiting professors and lecturers of national and international reputation. The full spectrum of intellectual activity is filled with opportunity for academic programs in each of the various colleges.

A distinguishing feature of the Summer Quarter, is the carefully planned and carried out program of recreational enrichment. The Director of Recreation supplies all students opportunities in their various interest fields for out-of-class activities on a regular, yet informally scheduled basis. University-wide programs are planned that provide activities both on the campus and in the coolness and convenience of the nearby canyons. Fieldtrips and tours, picnics, luncheons, and special dinners are arranged for organized and unorganized groups. Contests and tournaments are conducted both on the campus and in the Utah State Union. The new Student Union, supplies numerous outlets for recreation and relaxation.

The location of Utah State University, with its climate and scenic canyons, nearby national parks
and monuments, provides special inducements for comfortable and enjoyable study for all individuals interested in initiating and continuing their collegiate education at all levels.
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Student Services and Activities

Dean of Students Claude J. Burtenshaw; Associate Dean of Students and Dean of Women Leah Dunford; Assistant to the Dean of Students, Chairman, Scholarships, Awards, and Honors, John R. Williams; Director of the Student Union Evan Stevenson; Coordinator of Student Housing William S. Skidmore; Coordinator, Counseling and Testing E. Wayne Wright; Chairman, Student Health Services S. M. Budge; Student Employment Placement C. D. McBride; Foreign Student Adviser Orson Tew; Coordinator of High School Relations and Student Programming Gerald R. Sherratt; Coordinator of Student Government Rolfe Kerr; Student Loans Reese Murray.

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.

Inquiry from prospective students and those on campus who wish to obtain information and assistance with personal needs or out-of-class activities should be directed to the Office of Student Services.

Religion

The traditional philosophy of separating Church from State does not mean that the University may not have an interest in Religion. A university education, USU officials believe, should permit opportunities for religious participation and exploration.

Catholic, Protestant and LDS Churches offer religious courses for USU students in their near campus educational facilities. Credit earned in non-sectarian University approved courses may be transferred at the request of the student to his University transcript. Credit courses are considered as part of the student's academic quarter load at the University. Academic quarter load limits may be exceeded only with the academic dean's approval.

The churches also provide religious services, personal counseling and social activities. USU officials are interested in the spiritual and moral understanding of students and encourage them to participate in the church of their choice.

Housing

Residents must be regularly enrolled students at Utah State University. (Costs subject to revision.) Students living in dormitories are
required to pay a hall activity fee of $2 per quarter in addition to rent.

Supervised Living Accommodations for Single Women

All Freshman women not living at home must live in campus housing. In rare instances, special permission may be granted by the Dean of Women to live off campus. A request should be written by the parent or guardian at least one month before the opening of school.

*Apartment-Living Residence Halls* will accommodate six to eight women in an apartment. Accommodations consist of combination living-room-kitchen, bath, and three bedrooms. Living-room-kitchen is equipped with electric refrigerator, electric range, table, chairs, and draperies. Cooking utensils, dishes, towels, linens, bedspreads, irons, ironing boards for use in apartment 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 to $75 per quarter. Living rooms, recreation and sewing rooms, sun decks, and laundry rooms are shared. The University provides coin metered washing machines. Ample storage space is provided.

*A Conventional Board and Room Residence Hall* will accommodate 150 women, three 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.

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.

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.

The Triad Area. The area known as the Triads is in the married student housing area. Because of the increase in women student enrollment the University has converted six of these buildings to house single women. Each apartment, which will accommodate four women, has a kitchen-dining-living room arrangement. There are two bedrooms, one of which is furnished with two double-decked beds. The other is equipped with study tables as a study room. There is ample closet space and a large bathroom. All utilities except electricity are furnished and the electric bill is shared by the tenants. Supervision consists of a Head Resident couple and Student Assistants. Students assigned to these living accommodations will be expected to abide by the same rules and regulations as in all other women's residence halls. The rent is the same as in Moen, Greaves and Reeder Halls ($77 per quarter). There is city bus service from the area to the University, as well as to town.

A sketch floor plan and pictures of Triad buildings are shown on the second and fifth pages of the student housing brochure.
Supervised Living Accommodations for Single Men

A Conventional Board and Room Residence Hall will accommodate 360 men. A dwelling unit provides for eight men, two to a bedroom. Twenty meals per week are provided in the Student Union Cafeteria. Linen changes, bedding, study desks, lamps, and utilities are furnished. Towels and other personal effects are not furnished. A cost of $210 per person per quarter covers board and room charges. 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 renters. Cost of electricity and telephone expenses are shared by the six men in the apartment. The rent for one quarter is $70 per person.

Housekeeping apartments for 1, 2, 3, or 4 single men students are available in the University Apartments (Prefabs).

Quarterly rates are:

Rent for 1 person per apartment each ...... $125.00
Rent for 2 persons per apartment each ...... 70.00
Rent for 3 persons per apartment each ...... 55.00
Rent for 4 persons per apartment each ...... 42.00

For description see Living Accommodations for Married Students below.

Fraternity and Sorority 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 bedrooms, 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.

New two-bedroom apartments for married students are located at 10th North and 12th East. Monthly rental charge is $65.00. 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 private-owned laundry equipment. Monthly space rental per trailer home is $18.00.

LDS Student Living Center

The David O. McKay 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 10th North between 12th and 13th East. Charges are comparable to University housing. The units house 288 women and 216 men. Ample parking. City bus service on the half hour. Address all inquiries and applications to Housing Manager, David O. McKay Student Living Center, University Hill, Logan, Utah.

Off-Campus Housing

The Housing Office checks off-campus housing and establishes an approved list for students. Many apartments, rooms, board and room, and baching 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 65c. 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 103, Main Building.

Application for Housing

Prospective students are invited to direct inquiries and requests for application to Coordinator 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. Housing assignments are made on a receipt of application priority basis.

An accepted housing application qualifies a student for housing accommodations only. Application for University admission should be made to the Office of Admissions and Records, Main 110.

Housing Regulations, 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 10c 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. Monday through Friday schedules and approximate costs are: Breakfast 6:30-8:00 a.m., 50-65c; Lunch, 11:00 a.m.-1:00 p.m., 65-85c; Dinner 4:30-6:00 p.m., 75c-$1. Saturdays and Sundays, Breakfast 8-9 a.m., Lunch 12:1-30 p.m., Dinner 4:30-6:00 p.m. Dinner is not served on Sundays. The snack bar operates 8 a.m.-10 p.m., Mondays through Saturdays. Open Sunday evening, 5 to 7 p.m.

Awards, Honors, Scholarships
and Grants-in-Aid

The University offers a variety of scholarships and awards. Some of these are actual money grants in varying amounts, others provide for registration and tuition fees to be waived. The latter kind generally come under the classification of tuition scholarships.

The primary purpose of the tuition scholarships is to assist new students who have high scholarship and financial need in becoming established in college. These scholarships are discussed in greater detail under the section of Scholarships and Grants-in-Aid for new students.

Most of the scholarships which consist of actual money grants are reserved for students who have been attending Utah State University for at least one year and preferably two years or more. These are usually given at the Awards and Honors Convocation which is held early in May of each year. Students who are interested in awards may obtain information from the Office of Student Services, Room 102, Main Building. Closing dates for receiving applications are announced well in advance of such dates.

Scholarships and Grants-in-Aid

(Presented principally to students already enrolled.)

All Colleges

The Lieutenant Clyde Parker Baugh Memorial Fund. A gift of Mr. and Mrs. Wilford F. Baugh, it 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.

The Johansen Scholarship Fund. A gift of the late Mrs. Johana Johansen, it provides scholarships annually, worth in the aggregate from $125 to $150, for help of worthy students of Junior and Senior rank.

Phi Kappa Phi Scholarship. A $100 cash award given to a Sophomore student 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 $600 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 money in University work the coming school year. Checks will be sent to them following registration in the fall term.

The 1927 Class Gift to the College. This 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.

The Paul M. Dunn Scholarship in Forestry. See Dean's office for details.

College of Agriculture

4-H Scholarship offered by Alpha Gamma Rho. The national fraternity of Alpha Gamma Rho offers annually, a cash scholarship of $200 to be applied toward a full term course at any suitable accredited college of agriculture. The National 4-H Awards Committee has sole responsibility for selection of the winner from among the candidates nominated by the State 4-H Club Leaders, such selection to be on the basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

FFA Scholarship offered by Alpha Gamma Rho. The national agricultural fraternity of Alpha Gamma Rho offers annually a cash scholarship of $200 to be applied toward a full term course at any suitable accredited college of agriculture. The American Vocational Association has sole responsibility for selection of the winner from among candidates nominated by the State Supervisors of Agricultural Education, such selection to be on the basis of scholarship, achievement and demonstrated need. Further information may be secured from Alpha Gamma Rho Fraternity, 706 West Michigan Avenue, Urbana, Illinois.

First Security Foundation. Two scholarships of $500 each, one awarded to a student of Business and Finance and the other to a student in Agriculture, both at the end of their Sophomore or Junior year from either the Sophomore or Junior class.

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.

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.

A Cache Valley Cooperative Scholarship. This scholarship of $7,000 bears interest at 6 percent, earning $420 annually. This scholarship is limited to graduate students in the Departments of Sociology, Agricultural Economics and Dairy Industry. 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.

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, it 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

Manufacturing Engineers. Two $100 Scholarships are awarded to Engineering students who show interest, ability and scholarship in pursuing Tool Engineering curriculum. Donors are Eimco, and McGhee-Hogan Machine Works, Salt Lake City. Application should be made to the Salt Lake City Chapter 85, or Manufacturing Engineering Department, USU, not later than February 10, each year.

Associated General Contractors Scholarship. A gift of the Intermountain Chapter, AGC, provides a scholarship grant of $500 to a Junior Engineering student. The award is made on the basis of scholarship, promise as an engineer, and need. Selection is made by a committee representing the AGC and the Civil Engineering Department. Applications for the succeeding year must be filed with the Dean on or before April 1.

Industrial Arts Club Scholarship. The Industrial Arts Club of USU awards a scholarship of $50 to an outstanding Sophomore or Junior student majoring in Industrial Arts. The recipient is designated in fall quarter of each year. Applications are made to the Industrial Arts Club and are judged on scholarship, need, school and club activities.

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. A 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.

Esther V. Erickson Wrigley Scholarship. The Robert L. Wrigley family presents two scholarships annually to English majors in memory of Mrs. Wrigley. One $175 scholarship is given to an outstanding student of Sophomore standing, and one $225 scholarship is given to an outstanding student of Junior rank.

English Department Scholarship. The English Department awards annually one $150 scholarship to an outstanding student who has completed his Freshman year at USU. He must be an English major.

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.

All scholarships and grants-in-aid must be applied toward the payment of tuition or fees.

Any scholarship or grant-in-aid may be withdrawn at any time for academic or other good and sufficient reasons, if, in the judgment of the Dean of Student Services, the recipient has clearly demonstrated his failure to comply with both the spirit and the letter of the original terms of the scholarship or grant-in-aid.

Tuition Scholarship. The President of the University is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impecunious students whose domicile is in the state of Utah.

USU Faculty Women's League Annual Scholarship. This provides $125 for one year for a Freshman woman. Selection is based on need, scholarship, and leadership.

Union Pacific Scholarships. The Union Pacific Railroad awards 16 scholarships annually to Juniors or Seniors in high school who are enrolled as 4-H Club members, also 16 to FFA members. These members scholarships are $200 each and are to be used at Utah State University or its branches. The scholarships are available in the following counties: Beaver, Box Elder, Cache, Davis, Iron, Juab, Kane, Millard, Morgan, Rich, Salt Lake, Summit, Tooele, Utah, Washington, and Weber.

Intercollegiate Knight Scholarship. Two $100 scholarships will be given based on a combination of scholastic and leadership ability. The recipients must be single, male, from out of state, and of the Freshman class. They will be asked to attend one of the regular IK meetings and tell the group about their future plans.

Logan Kiwanis Club. One $100 scholarship awarded to an outstanding student who is in need of financial assistance. They also support the Circle K Club.

Logan Lions Scholarship. The Logan Lions club will award two $100 scholarships to be given to students selected by the Logan Lions Scholarship Committee. Nominees for the scholarship will be selected by the Office of the Dean of Students. Emphasis will be given to need. Scholarships will be awarded to a Sophomore or older student for either Winter and/or Spring Quarter.

Logan Rotary Club. Three $100 scholarships awarded to outstanding students who are in need of financial assistance.

National 4-H Club Contests. National scholarships of $500 each are available to 4-H Club members in at least 22 different projects or activities.

Palmer Scholarships. Val W. Palmer scholarship fund gives ten scholarships of $100 each and are awarded each year to students of outstanding scholarship and leadership ability.

Woodey B. Searle Scholarship. A tuition scholarship is awarded each year by Woodey B. Searle to a needy and deserving graduate of the Uintah High School. Applications should be filed before April 15th with the principal of the UHS at Vernal.

Sears-Roebuck Foundation Scholarship. Thirteen scholarships of $800 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 stand-
Awards and Honors

William Alger Awards. A gold key is awarded annually by Alpha Epsilon Delta, pre-medical society, to the outstanding Freshman pre-medical or pre-dental student. Scholarship, character and possibilities in medicine or dentistry represent the basis for the award.

Alpha Kappa Psi Scholarship Key Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter, established at Utah State University, awards annually the Alpha Kappa Psi Scholarship Medallion to the male Senior in Business with the highest scholastic average for four years of study in this University.

Alpha Kappa Psi Scholarship Key Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter, established at Utah State University, awards annually the Alpha Kappa Psi Scholarship Medallion to the male Senior student in Business who possesses the highest scholastic average for three years of work taken in this University.

Alpha Lambda Delta Award to Senior Students. Book Award. An award to a Senior woman who has been an Alpha Lambda Delta member and who carries the highest grade-point during her four years of college.

Alpha Zeta Award. An award is made annually by Alpha Zeta fraternity honor society of Agriculture and Forestry students, to the Sophomore in Agriculture or Forestry who has demonstrated his scholastic record in his Freshman year. The name of the winner is engraved upon a permanent trophy.

American Institute of Electrical Engineers. Awarded annually to the member of the student chapter who has contributed most to the IRE organization, and who has demonstrated professional ability. This award consists of a certificate of merit and one year’s dues as an associate member of AIEEE.

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, it is awarded each year to the athletic letterman who maintains the highest scholastic record during the year, and who exhibits the most wholesome attitude toward military training.

The American Rambouillet Sheep Breeders’ Association Challenge Cup. To be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

American Society of Agronomy Leadership Award. A plaque to the outstanding Senior in Agronomy.

American Society of Civil Engineering Associate Memberships. Awarded annually to Senior Engineering students on the basis of scholarship, promise of success in engineering, personality, and ASCE student chapter activity. The awards consist of associate membership in the American Society of Civil Engineers. The first is given by the Intermountain Section of ASCE; the second by the Civil Engineering faculty; and the third by the student chapter of ASCE.

ASCE Membership Award. Junior Membership Award. Junior Membership in the American Society of Civil Engineers is awarded by the Intermountain Section, ASCE to a graduating Senior in Civil Engineering on basis of scholarship, activities, and personality. Selection is made by the Intermountain Section upon recommendation by the Engineering Faculty.

ASCE Student Chapter Award. Junior Membership in ASCE to the Senior doing most for the chapter. Selected by vote of members.

The Barnes Key. Rey and Marjorie Barnes award a key annually to an undergraduate student who is affiliated with the campus radio or television station. The student must have a cumulative grade point average of 2.5 or above, must have carried at least one radio class during the year of the award, and must have demonstrated a deep interest in furthering radio and television arts at Utah State University. Selection shall be made by the Director of Radio and Television at USU, the person directly responsible for the campus radio station, and Rey L. Barnes.

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a “Service Plaque” to an outstanding Freshman or Sophomore male student. Candidates are judged on University activities, scholarship, service to the University, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

Burpee Award in Horticulture. An annual award of $100 to the student in Horticulture who rates highest in scholarship, practical experience and interest in flower, vegetable and seed growing.
Cache Valley Chapter of the Utah State Historical Society Award. The Cache Valley Historical Society offers annually an award of $25 to the USU student writing the best acceptable treatise on any phase or field of Cache Valley history. Papers must be submitted on or before the end of the spring quarter and become the property of the Cache Valley Historical Society.

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 its Handbook of Chemistry and Physics to the outstanding Freshman student completing Chemistry 10 and 11.

Chi Omega Fraternity Award. An award of $25 is given annually to the girl majoring or minoring in Social Sciences who gives evidence of superior scholarship and ability to make a contribution to organized group life. The Committee of Awards is appointed by Chi Omega Fraternity each year from the teaching staffs of the Sociology and Economics Departments.

Civil Engineering Faculty Award. Junior membership in the ASCE or ASAE 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 Economics. 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 mar- ket ing 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. This is awarded to Senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to University life, as exemplified by the following considerations: (1) Awareness of issues vital to university life, (2) individual responsibility for their solution, and (3) accommodation of individual interest to what seems to be the common good. (University award winner excluded.)

Faculty Women’s League Scholarship Award. Awarded to Senior women, based on scholastic records for full undergraduate work. To be eligible for this award, candidates must have spent at least two years at this institution. (Valedictorians excluded.)

Farm Bureau Agricultural Leadership Award. An award of $200 to the Senior who has exhibited the greatest measure of growth and excellence in scholarship, constructive organization and leadership in the College of Agriculture throughout his university course. The winner’s name will be engraved on the Caine Leadership Plaque.

Foreign Student Achievement Award. A certificate of achievement to a graduating foreign student from a non-English speaking country who has the highest scholastic average during his undergraduate study.

The Hawaiian Steamship Company’s Challenge Cup. Awarded each year to the student who shows the most proficiency in judging wool.

Home Economics Awards. Certificates of merit are conferred annually upon Senior women in Home Economics adjudged by faculty and Seniors upon the following basis: (a) application of Home Economics ideals to daily living, 50 points; (b) leadership in class work and other activities, 50 points. The number of awards shall not exceed 5% of the total graduating class. Candidates shall have a grade point average of three or better.

Institute of Radio Engineers Award. This award is made each year to the outstanding senior Electrical Engineer and ITE 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 Stockyard 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, it is awarded each year to the student in Military Science and Tactics who most nearly represents the ideal that the Reserve Officers' Training Corps is striving to develop, upon the following basis: (a) Character, 20 points; (b) Scholarship, 15 points; (c) University activity, 15 points; (d) Leadership, 20 points; (e) Aptitude for and interest in Military Science, 20 points; (f) Physique and bearing, 10 points.

The Salt Lake Union Stockyards Company Challenge Cup. Awarded each year to the student who shows the most proficiency in judging hogs.

Scholarship A's. In the form of gold pins, these awards are given to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholastic Award.

Sigma Tau Award. To the outstanding Sophomore Engineering student for scholarship, sociability and practicability. Selection made by the Alpha Delta Chapter of Sigma Tau, an honorary engineering fraternity.

J. Fish Smith Award. An award of $100 for the promotion of international relations, given to a foreign student in recognition of excellence in scholarship and contribution to international understanding and good will.

Son of Paul Award. Awarded to the graduating Senior in the College of Forest, Range, and Wildlife Management, who has maintained a high academic record and shows promise of achieving outstanding professional success.

Swift and Company Award. Awarded 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. This award is conferred annually upon the male student of the institution who shows evidence of being able, in greatest measure, to repay the nation the investment which it has made in him, on the following basis: (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. This 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.

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, it is given each year to the student writing the best review of recent scientific research in either mathematics, physics, chemistry, geology, zoology, botany or astronomy.

Wall Street Journal Award in Business. A medal and one year's subscription to the Wall Street Journal is given for outstanding achievement in Business Administration.

Colonel Joe E. Whitesides Award. This award is given to the outstanding student-athlete selected by the Athletic Council on the basis of (1) academic achievement, (2) athletic achievement, (3) Army (ROTC)
achieveation, (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. Entering Freshmen may be required to have been in attendance at the University for one quarter prior to consideration for a loan.

Application forms for these long-term, low-interest loans may be obtained in Room 118 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 at the Office of Student Loans, Main Building, Room 118.

The total Student Loan Fund is composed of the following individual loan funds generously contributed by friends of USU:

- Clyde Foundation Loan Fund. See Student Services for details.
- USU Faculty Women's League. A loan fund for women students. Loans may range from $25 to $250. Preference is given to Senior students.
- USU Faculty Women's League Revolving Loan Fund. A loan fund which provides for short time loans, not to exceed $20, to women students for emergency purposes.
- Senior Loan Fund. A gift of the class of 1911, and added to by the class of 1922, has helped many students complete school.
- Rotary Club Senior Loan Fund. The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year.
- Robert L. Judd Loan Fund. This loan fund was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and need financial assistance.
- W. B. Rice Memorial Loan Fund. This loan fund provides loans up to $200, usually for one year, to deserving students in the College of Forest, Range and Wildlife Management. Application is made to the Dean's Office.
- Bureau of Land Management Loan Fund. This provides loans up to $100 to deserving students in the College of 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. This loan fund is available to Senior Engineering students only. Application is made in the College of Engineering.
- Harold R. Kepner Loan Fund. A fund established in memory of Professor Harold R. Kepner by his students and friends. Available through the general loan funds of the University.
- Eugene Santschi Loan Fund. A fund established in memory of Eugene Santschi. The applications may be made through the NDEA Loan Fund of the University.
- John P. Holmgren Loan Fund. A fund established in memory of John P. Holmgren. The applications may be made through the NDEA Loan Fund of the University.

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'
Employment Placement, Counseling 321

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 Adviser, Main 102, 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 216, Mechanical Arts 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, 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. The Student Health Service is located in the basement of the Union Building. The staff consists of one full-time physician, two registered nurses and a receptionist. All Freshmen and transfer students are required to complete the Medical Examination Record and return it directly to the Office of Admissions and Records before a permit to register will be issued. Whenever possible the Medical Examination Record should be completed by the family physician.

University officials strongly urge students to purchase the Voluntary Student Accident and Sickness Insurance available to them at the time of registration. Included in the services available at the Student Health Service are medical and surgical care for minor illnesses and injuries, inoculations and immunizations and limited laboratory facilities. Services not included are hospital care for non-emergency conditions, x-ray examinations or special prescriptions. Students not covered by Personal or group insurance should not be without the student insurance.

In case of illness or emergency during office hours, students should notify or go directly to the Student Health Service. After office hours the student should go to his private physician or to the Logan LDS Hospital, where the doctor on call will be available. If the student is unable to go to the hospital, he may call 752-2050 and the doctor on call will be sent to the residence of the caller.

Medical care at the Student Health Service is free. Any further medical care beyond that provided at the Service must be paid for by the student or his insurance plan.

The Student Health Service is open from 8 a.m. to 12 noon and 1 p.m. to 5 p.m. Monday through Friday. Telephone: 752-4100 Ext. 435.

Orientation

A program of activities has been designed to acquaint students with the life and environment of the University community. Participation in these orientation activities is required of all new students at the beginning of each quarter. In addition to group meetings for instruction in traditions, policies and procedures, there are opportunities for 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 not completed a full year of freshman English, and who has less than 96 quarter credit hours is required to have the results of the American College Testing Program Examination (ACT) on file with the University Counseling & Testing Service. The results are used by faculty and counselors to assist in placement and as guidance aids.

Foreign Student Advisement

Students from outside the United States are provided counseling and assistance in personal and academic matters as well as those related to immigration procedures, through the office of the Foreign Student Adviser. All students from abroad must register with the Adviser, in Room 102 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 “IC” 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, food, 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

Intramurals. The intramural program provides individual and team competition in badminton, basketball, golf, handball, horseshoes, pentathlon, swimming, softball, tennis, touch football, track and field, volleyball, weightlifting, winter carnival, and wrestling.

The purpose of the intramural program is to give each student unlimited opportunity for leadership, development of skills, sportsman-
ship, and good wholesome use of leisure time.

**Musicals.** Performances are given by band, orchestra, choral groups, and music clubs. These organizations present several concerts and recitals during the year, and participate in tours to the surrounding area.

**Theatricals.** Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.

**Debating and Public Speaking.** The University is a member of the Rocky Mountain Forensic League, and each year meets schools of this group in discussion. Participation in debate tournaments in the Intermountain and Pacific Coast Region provides opportunity for experience in tournament debating. Utah State is noted for its Mid-Winter Speech Meet.

**Student Publications.** Students publish a thrice-weekly paper, *Student Life*, a yearbook, *The Buzzer*, and a literary magazine, *Crucible; Blue Book*, the official student handbook which contains the Student Directory, is available to all regularly registered students. Some campus organizations sponsor publications of their own.

**Radio-Television.** The University owns and operates radio station KUSU-FM and television station KUSU-TV, both of which provide broadcast services available to students and the public, and both of which provide participation opportunities in broadcasting for qualified students registered in any course of study in the university.

KUSU-FM is managed by a staff member of the Radio-Television Department, but all department heads and operating staff positions are open to qualified students whose academic standing permits participation in extra-curricular activities. KUSU-FM broadcasts ten hours per day during regular school periods.

KUSU-TV operates on Channel 12 with 30,000 watts of power. The station broadcasts a daytime schedule of classroom programs available to the school systems of the area from September to June. The evening schedule continues year round transmitting national educational network programs in the areas of cultural and public affairs, as well as carrying an extensive schedule of programs featuring university and community resources, and exchange programs with other educational broadcasting stations. Television programs are also recorded in the USU studios for broadcast from other stations in Utah. Qualified students assist in all phases of television production.

KUSU-FM and KUSU-TV are under the direction of the Chairman of the University Radio-Television Department. Students interested in participating in these University broadcasting services should apply to that office.

**Utah State University Entertainment Bureau.** The Utah State University Entertainment Bureau serves to provide challenging opportunities to the entertainment arts and is designed to assist in the development, promotion, encouragement and coordination of student vocal, instrumental, dramatic, dance and specialty talent. Students may apply for membership in one of the bureau’s eleven departments, including bureau assemblies, traveling assemblies, competitive assemblies, public affairs assemblies, civic programming, talent development, publicity, production, varsity show, student speakers, and technical arrangements, or students may audition for performance opportunities.

Bureau sponsored and produced programs travel throughout the In-
terrnountain West, appearing before conventions, at church and civic meetings, and at area high schools and colleges. The Bureau is directed by the coordinator of Student Programming. Offices are maintained in the Utah State Union.

The Bureau sponsors a wide variety of performing groups, including a twenty member folk-singing chorus, the Balladiers, numerous duets, trios, and other kinds of singing groups, in addition to individual talent. A master file of all student talent is maintained in the Bureau offices.

Program requests should be directed to the Coordinator of Student Programming, Room 102, Old Main Building, Utah State University.

Utah State Union Activity Board.
The purpose of the Union Activity Board is to provide students with the opportunity to plan and present activities and events which they would enjoy and to help develop their talents, creative abilities and leadership traits.

All students are encouraged to apply for membership on one of the following educational, cultural, recreational, or social committees: concert (sponsors concerts by national and internationally renown artists, together with campus and off-campus chorales, bands, and orchestra groups); dance (plans student body evening and matinee dances); games (arranges campus tournaments, intercollegiate competitions, and professional exhibitions); gallery (schedules and displays exhibitions of paintings, prints, ceramics, sculpturing, and photographs of both local and national artists); hospitality (members serve as receptionists for campus visitors, as host for teas and receptions, conduct guided tours); movies (sponsors campus wide entertainment movies); music (sponsors talent shows, stereo rooms); publicity (conducts all publicity for events in the total Union program); publications (responsible for planning, designing and preparing Union brochures, pamphlets and programs); special events (sponsor all Union programs of a special nature); world culture (provide for displays and programs related to the varied cultural backgrounds of students enrolled at the University).

Student Government
Associated Students. All students of Utah State University, upon payment of student activity fees, become members and are therefore entitled to participate in and attend all activities sponsored by the association. Athletic events, musicals, dramas, dances, lyceums, etc., are events to which members of the ASUSU are admitted by activity card.

The Executive Council consists of five elected major officers of Associated Students: president, social vice president, cultural vice president, financial vice president and secretary. The council plays a major role in directing all student-conducted activities on campus.

The Student Senate is the legislative branch of student government and initiates policies for the welfare of the entire 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, an international representative elected by the foreign students on campus, the president of Panhellenic, president of Interfraternity Council, President of Interresidence Council, President of Co Orgs, and as non-voting members, editors of Student Life and Buzzer.

Associated Women Students. Every woman student properly reg-
istered 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, Dairy Club, Horticulture Club, 4-H Club, Pre-Vet Club, Rodeo Club, Animal Husbandry Club.

*Business.* Alpha Kappa Psi.

*Chemistry.* American Chemical Society.

*Education.* Phi Kappa Delta, Student Education Association, Utah State Education Association.

*Engineering.* Engineering Council, American Society of Civil Engineers, American Welding Society, Industrial Teachers Education Club, Sigma Tau, Society of Automotive Engineers, Flying Techs, Institute of Electrical and Electronics Engineers, Theta Tau, American Society of Tool and Manufacturing Engineers, American Society of Mechanical Engineers.

*Forestry.* Forester's Club, Forestry Wives, Xi Sigma Pi, Forest, Range, and Wildlife Council, Student Chapter of Wildlife Society, Student Chapter of Range Society.

*Geology.* Geology Club.

*History.* Phi Alpha Theta.

*Home Economics.* Phi Upsilon Omicron, Zeta Upsilon Club.

*Landscape Architecture.* Landscape Architecture Club. Student Chapter of the American Society of Landscape Architecture.


*Music.* Band, Orchestra, Madrigals, University Marching Band, University Concert Band, Varsity Band, Scotsmen Dance Band, University Symphony Orchestra, University Opera and Chamber Orchestra, Music Educators National Conference.

*Physical Education.* Badminton Club, Dance Club, PEMM (PE majors and minors), Ski Club, Square Dance Club, Swimming Club, Women's Intramural Association, Men's Intramural Association.

*Political Science.* International Relations Club, Pi Sigma Alpha, Pre-Law Club.

*Pre-Med.* Alpha Epsilon Delta.

*Psychology.* Psychology Club, Psi Chi.

*Sociology.* Sociology Club.

*Speech and Drama.* Tau Kappa Alpha, Theta Alpha Phi, Utah State University Speech and Hearing Association.

*Zoology.* Utazoa Club.

**Social and Special Interest**

*Fraternities, Social.* Alpha Gamma Rho, Delta Sigma Phi, Pi Kappa Alpha, Alpha Epsilon Sigma, Chi, Sigma Nu, Sigma Phi Epsilon.

*Sororities, Social.* Alpha Chi Omega, Alpha Omicrom Pi, Chi Omega, Delta Delta Delta, Kappa Delta, Sigma Kappa.
Recognition and Honorary. Alpha Sigma Nu, Alpha Zeta, American Student Academy, Arnold Air Society, Pershing Rifles, Phi Alpha Theta, Sigma Phi Eta, Sigma Tau, Xi Sigma Pi.

Regional. Canadian Club, Arab Student Organization, Dixie Club, Weber.


Scholarship. Alpha Lambda Delta, Phi Alpha Theta, Phi Eta Sigma, Sigma Tau, Phi Kappa Phi.


Public Services and Information

Public Relations, Services
LeRoy A. Blaser, Director

Publications
John J. Stewart, Editor, University Publications
Christian P. Nielsen, Editor, Extension Service Publications
Lois M. Cox, Assistant Editor, Agricultural Experiment Station and University Research
J. Lyn Larson, Editor, Alumni Association Publications
Gwen H. Haws, Editor, School of Graduate Studies Publications

Newspaper News Releases
J. R. Allred¹, Editor, University News
Cleon M. Kotter, Information Specialist, Extension Services and Agricultural Experiment Station
Harvey Kirpatrick, Editor, Athletic News

Radio-Television News and Programs
Burrell F. Hansen, Chairman, University Radio and Television
Arthur L. Higbee, Extension Service Radio and Television Specialist
Warren L. Burton, Producer-Director, KUSU-TV
Gerald L. Allen, Manager, KUSU-FM
Rey L. Barnes, Director of Instructional Broadcasting
Boyd V. Humpherys, Radio-TV Chief Engineer

Photographic Service
Arlen L. Hansen, University Photographer

Duplicating Service
Clark Kidd, Supervisor

¹on leave
Public Services and Information

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, Correspondence Catalog, Audio-Visual Aids Catalog and to bulletins featuring the various departments and offerings of the University, and to research by the Division of University Research and the Engineering Experiment Station.

(2) Brochures for conferences, workshops and other events.

(3) Extension Service Bulletins of an instructional type, in agriculture and homemaking especially.

(4) Agricultural Experiment Station Bulletins, reporting results of research.

(5) A Monograph Series featuring essays and lectures of USU faculty members.

(6) Farm and Home Science, a quarterly magazine of state-wide distribution, featuring research conducted by the University and its affiliated organizations.

(7) The Alumnus magazine, published nine times a year, containing news and features for USU Alumni.

(8) Student publications, including Student Life, a tri-weekly newspaper; Crucible, a semi-yearly magazine, and Buzzer, the yearbook.
Department of Intercollegiate Athletics

Director Frank "Buss" Williams; Assistant Director Dale L. Gardner; Publicity Harvey Kirkpatrick; Ticket Manager Tom Moulton; Trainer Jim Railey; Equipment Manager Mike Carlisle; Football Tony Knap, Head Coach, George Galli, Ralph Maughan, George Porter, John Math, Norvel Hansen; Basketball Ladel Andersen, Head Coach, Evan Sorenson, Norvel Hansen; Baseball Jim Railey; Golf Everett Thorpe; Tennis Lincoln McClellan; Track Ralph Maughan; Skiing Doug Litchfield; Swimming Dale L. Gardner; Wrestling George Galli.
Office in Fieldhouse

Organization. USU's Intercollegiate Athletics is organized under the rules and by-laws of the National Collegiate Athletic Association, and the Utah State University.

Participation. Varsity teams at USU schedule in the University division of the NCAA. Our teams compete on a national and area basis and are recognized for their successes at these levels. Fall quarter participation includes football, cross country, golf, and tennis. Winter quarter participation is basketball, wrestling, skiing, swimming, and indoor track. Spring quarter is spring football, baseball, track, golf, and tennis. Qualifiers in all sports may represent USU in NCAA post-season activity.

Facilities. Our home football games are played in Romney Stadium with a 15,000-spectator capacity. Our basketball arena is the 6,000 capacity George Nelson Fieldhouse. The fieldhouse also has a practice area for football, baseball, golf, tennis, and an indoor running track. Golf course and ski areas are near the campus.

Registration and Eligibility. All male students at USU are encouraged to participate in the various varsity and freshmen intercollegiate activities. Registration for participation may be accomplished by contacting any of the coaches or registering for the class work listed in the registration bulletin. Eligibility for participation is governed by rules and regulations established by the National Collegiate Athletic Association and by the Faculty Senate of the University.

Awards and Grants-In-Aid. The Athletic Department of USU offers awards and grants-in-aid in all sports for athletic excellence. A student or prospective student desiring consideration for one of these awards may contact one of the coaches for further application. Any awards granted will fulfill the agreement between the coach and the recipient with approval of the Scholarship Committee.

Supervision. Supervision and direction of athletics for men is vested in the Director of Athletics and the Athletic Council, consisting of the President of the University, members of the faculty, the alumni, and student organizations.
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Research Programs

Vice President, Research, Director, Agricultural Experiment Station, D. Wynne Thorne; Director, Engineering Experiment Station, Clayton Clark; Director, Utah Water Research Laboratory, Vaughn E. Hansen; Chairman, Utah Center for Water Resources Research, D. F. Peterson; Chairman, Center for Social Science Research on Natural Resource Problems, N. Keith Roberts; Chairman, Bureau of Educational Research, Walter R. Borg; Manager, Utah Scientific Research Foundation, W. Karl Somers; Dean, School of Graduate Studies, J. Stewart Williams; Leader, Utah Cooperative Wildlife Research Unit, Jesse B. Low; Leader, Utah Cooperative Fishery Research Unit, Donald R. Franklin; Leader, Utah Cooperative Forest Recreation Research Unit, J. Alan Wagar.

Utah State University was among the first of the colleges and universities in the Intermountain area to have 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 operation are in several organizations. The principal organizations and areas of research are as follows:

Division of University Research

D. Wynne Thorne, Vice President, Research
Office in Main 127

It is the policy of the University to encourage and support research and all forms of creative, scholarly activities by staff members. Much of the research not associated with the Agricultural Experiment Station is administered under the Division of University Research. This research is supported by institutional funds and by grants from various private and public agencies.

Policies on research and requests for support are reviewed by the University Research Council. Present members of the Council and the area each represents are: A. Ray Johnson, Literature and Arts; Vernon L. Israelsen, Business and Social Sciences; Datus M. Hammond Biological Sciences; W. Farrell Edwards, Physical Sciences; Walter R. Borg, Education; C. Wayne Cook, Forest, Range and Wildlife Management; Elveda Smith, Family Life; Clayton Clark, Engineering and Technology; J. Stewart Williams,
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.

Income to the state from federal lands is apportioned in part to institutions of higher education. That coming to Utah State University is used for research purposes. A part of this is available to faculty members for projects approved by the Research Council. Information concerning this program can be obtained from the Office of the Division of University Research. The Division also gives assistance with applications to off-campus agencies for research funds.

Agricultural Experiment Station

D. Wynne Thorne, Director
Kenneth W. Hill, Associate Director
Office in Agricultural Science 225A

The Agricultural Experiment Station is a major division of the University. It was established in 1888 when the territorial legislature passed a bill creating Utah Agricultural College and Utah Agricultural Experiment Station. It is commissioned by state and federal legislative acts to conduct the research needed to conserve and manage natural resources, to produce and prepare food and fiber, and to develop and improve rural homes and rural living.

The investigations needed to fulfill Experiment Station responsibilities involve the full or part time services of about 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, 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 50 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 180 research projects. Some of the areas of research include: breeding and testing of new and improved crop varieties; the diagnosis and control of plant diseases; the control of insects; diagnosis and control of diseases and parasites of animals; the breeding and nutrition of dairy and beef cattle, sheep and swine; breeding and testing improved lines of laying hens and turkeys; the feeding and nutrition of poultry; production of vegetable and fruit crops; weed control; mapping...
and classification of soils; fertilizing and managing soils; irrigation and drainage; managing watersheds and rangelands; forestry; wildlife management; conservation of water and soils; gathering snow survey data and predicting stream flows; research on processing and marketing of farm products; finding new or improved uses of farm products; the economics of agricultural production; human nutrition; social relations of rural people; and recreation. The investigations range from applied field tests to fundamental research under controlled laboratory conditions.

Station research is periodically reviewed by advisory committees representing every segment of the agricultural industry. These committees evaluate the progress of research efforts and recommend problems in need of further study.

Main offices of the Agricultural Experiment Station are on the University campus in the Agricultural Sciences Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed among the various University buildings.

Field stations, farms, and research laboratories are operated in cooperation with College of Southern Utah at Cedar City, Snow College at Ephraim, and at about 14 other off-campus locations. Individual studies are conducted in cooperation with farmers, ranchers, retail stores, and many other business organizations.

**Engineering Experiment Station**

Dean F. Peterson, Dean, College of Engineering
Clayton Clark, Director, Engineering Experiment Station

**Office in Engineering Building C216**

The Engineering Experiment Station is a major part of the College of Engineering. It has a broad purpose of furthering engineering sciences, engineering arts, and engineering education.

The Engineering Experiment Station was established in 1918 by act of Board of Trustees. The Director has supervisory responsibility to the Dean of Engineering for all research conducted by the various departments.

Staff members of the Civil, Electrical, Manufacturing, and Mechanical Engineering Departments, and the Industrial and Technical Education Department are also members of the Engineering Experiment Station. Staff members may be employed full or part time on research.

The Station conducts basic and applied research in civil, electrical, mechanical, tool and manufacturing, and agricultural engineering, as well as in industrial and technical education. Results of these studies are published in research bulletins, in engineering reports and papers, or otherwise made available to those interested.

In addition to the regular academic laboratories and facilities, the Engineering Experiment Station has the following specialized research laboratories and institutes under the supervision of the senior research staff as noted. Projects under these laboratories are financed
Research Programs

by Federal Grants, Utah Uniform School Funds and industry.

Antenna and Propagation Laboratory. Dr. Clayton Clark, Dr. Ronney D. Harris.

Control and Simulation Laboratory. Dr. Bruce O. Watkins, Professor Duane G. Chadwick.

Electroacoustic Laboratory. Professor Larry S. Cole

Electro-Dynamics Laboratories. Dr. Doran J. Baker, Dr. John J. Merrill, Dr. Craig Rushforth. Consisting of the following laboratories:

Luminescence Laboratory—Dr. J. J. Merrill, Mr. F. R. Brown, Jr.
Concord Radiance Laboratory—Mr. S. P. Stewart, Jr., Mr. J. E. Hoffman Mr. T. P. Condon
Chemiluminescence Laboratory—Dr. William M. Moore
Aerospace Radiation Laboratory—Mr. W. K. Barlow

Aerospace Instrumentation Laboratory—Mr. C. L. Wyatt

Fluid Mechanics Research Laboratory. Dr. Calvin Clyde, Dr. Richard Mayer, Dr. Ronald McKay, Dr. Gordon Flammer.

Gas Dynamics Research Laboratory. Dr. Richard Mayer, Dr. Calvin Clyde.

Soil Mechanics Research Laboratory. Dr. Irvin S. Dunn, Dr. R. K. Watkins.

Solid State Electronics Laboratory. Professor Wm. L. Jones, Professor W. Arnold Finchum.

Structural Materials Research Laboratory. Professor Wm. Cordon, Professor J. Derle Thorpe.

Technical Education Research Institute. Dr. Austin G. Loveless, Dr. Carl Bartel, Dr. William Mortimer.

Thermodynamics and Heat Transfer Laboratory. Dr. Ronald McKay.

Utah Water Research Laboratory

Dean F. Peterson, Dean, College of Engineering
Vaughn E. Hansen, Director, Utah Water Research Laboratory

Facilities and staff exist at the Laboratory to conduct research on a wide variety of water problems affecting all users of our water resources.

The Utah Water Research Laboratory was authorized by the Utah State Legislature in 1959 and was built at a total cost of $1,600,000 with funds supplied by the State Legislature, the National Science Foundation, and the National Institutes of Health.

The unique design of the Laboratory provides 80,000 square feet of space with flexibility for attacking a wide variety of problems. Specialized laboratories for instrumentation development, microbiological and chemical analysis, sedimentation studies, and analog developments are included.

The research staff of the Utah Water Research Laboratory are also staff members of the academic departments. Students are employed at the Laboratory and graduate theses and dissertations are supported by laboratory research projects.

The research program of the Utah Water Research Laboratory is financed by federal, state, and private agencies. Both basic and applied research are encouraged. Some of the nationally recognized current research of the Laboratory is as follows:

A Hydrologic Analog Model of the Sevier River is analyzing data that will permit better understand-
ing and fuller utilization of the limited water resources. The hybrid design allows the analog to be used to study other river basins.

A Rainfall Similator has been designed and built which permits storms of desired characteristics to be moved across model watersheds similar to storm movement on the prototype.

Watershed Characteristics are being studied for better methods of predicting flood flows and runoff characteristics.

Studies of the Hydraulics of Over­land Flow have produced significant advances in the theory and practical aspects which apply to the design of surface irrigation systems and the characteristics of flow over watersheds.

Tumbling Flow. The turbulent flow that characterizes mountain streams, has been of great interest and is being intensively investigated.

Low-cost Prefabricated Irrigation Structures for farm use have been designed and are now available commercially. They can be readily assembled and installed.

New Ultrasonic and Electronic Methods are being developed for measuring sediment size and concentration in streams.

New techniques are being developed for transmitting snow depth and water content information by radio from watersheds to central headquarters.

An effective plan for the utilization of Utah’s water resources is under study in cooperation with the Utah Water and Power Board. The Great Salt Lake and the Weber Basin are receiving intensive study.

New ways are being developed for using climatological data to predict the evaporation of water from lakes and to predict water use by plants. Water requirements of marshlands are being determined.

Reduction of evaporation from large reservoirs and lakes is being accomplished by application of hexadecanol by airplanes.

New instrumentation concepts for field use in measuring and evaluating water resources and flow phenomenon are being developed.

Cloud seeding along the Wasatch Front using new concepts of instrumentation, control, and evaluation is under way.

An Inter-American Center for Land and Water Resource Development is being established in Latin America to assist in the development of land and water in the 20-member nations of the Organization of American States.

Utah Center for

Water Resources Research

D. F. Peterson, Chairman; J. W. Floyd; E. J. Gardner; V. E. Hansen; K. Hill; Vearl R. Smith; D. W. Thorne.

The Utah Center for Water Resources Research was created by the Board of Trustees of Utah State University on November 23, 1964. The governing body of the Center is a Council composed of the deans of
the colleges of Agriculture; Engineering; Forest, Range and Wildlife Management; and Science; the Vice President for Research; the Director of Agricultural Experiment Station; and the Director of Utah Water Research Laboratory.

The purposes of the Center are:

1. To coordinate University-wide research in the field of water resources as described by "The Water Resources Research Act of 1964."

2. To administer the provisions of the Water Resources Research Act as they relate to Utah State University and the state of Utah.

3. To encourage and foster the development of inter-departmental research and educational programs to the water resources field.

All University staff members and collaborators engaged in water resources education or research are associates of the Center. The Center encourages development of instructional programs that will further the training of water resource scientists and engineers and implements programs related to water resources research in education both on and off the campus. It maintains liaison relationships with appropriate state, national, and international organizations and agencies having similar objectives, including the Universities Council on Water Resources. It is cognizant of the total program of water resources research of the University and its relationship to the activities of state and federal agencies and communities and conducts seminars on various aspects of water resources research needs.

**Center for Social Science Research on Natural Resource Problems**

N. Keith Roberts, Chairman
Office in Agricultural Science 256

This is a research organization that promotes and coordinates social science research on the natural resources of land, water, and air. The Center was organized in 1962 by action of the Board of Trustees, and serves as a clearing house for idea and methods related to social science research on land, water, and air use problems. It provides leadership in planning and conducting social science research on natural resources and gives assistance to staff members in seeking financial support from other agencies interested in social science research on land, water, and air.

Membership in the Center is voluntary and limited to Utah State University staff members conducting social science research on natural resources. Associate membership in the Center is open to staff members interested in seminars and other activities sponsored by the Center but who are not leaders in Center-sponsored research projects.

The Chairman of the Center is administratively responsible to the Vice President for Research.
Bureau of Educational Research

John C. Carlisle, Dean, College of Education
Walter R. Borg, Chairman, Bureau of Educational Research
Office in Education 412-B

The College of Education maintains a Bureau of Educational Research which serves the following functions:

(1) Coordinates research activities in the College of Education. The bureau cooperates closely with the Division of University Research and the School of Graduate Studies.

(2) Plans and conducts educational research in problem areas of interest to Utah educators.

(3) Provides information and research services to Utah educational administrators.

(4) Represents the University in state-wide and nation-wide cooperative educational research projects.

(5) Provides guidance and research source materials to graduate students in the College of Education.

Utah Scientific Research Foundation

W. Karl Somers, Manager
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 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.

Officers and directors of the Foundation are: Daryl Chase,
President of the University; Dee F. Wangsgaard, Hubert C. Ward, Ernest G. Earl, Blaine W. Hancey, Robert P. Collier, Eldon J. Gardner,

Dean F. Peterson, and D. Wynne Thorne, Directors; W. Karl Somers, Project Director; and J. LeMar Larsen, Secretary-Treasurer.

**School of Graduate Studies**

J. Stewart Williams, Dean
Office in Library 239

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 and Zoology 167

The Utah Cooperative Wildlife Research Unit was initiated in 1935 through a Memorandum of Understanding between the Utah State University, Utah Fish and Game Commission, Wildlife Man-
agamation 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 and Zoology 279

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.

Utah Cooperative

Forest Recreation Research Unit

J. Alan Wager, Leader
Office in Forestry and Zoology 271

A Utah Cooperative Forest Recreation Research Unit was established at Utah State University in August, 1962. It was the first of three such units established in the United States. Objectives of the
program are to cooperate with members of the University staff in Forest Recreation research in the biological and sociological aspects of Forest Recreation.

Cooperating in the Unit are Utah State University with its Department of Forest Management, and the U.S. Forest Service's Intermountain Forest and Range Experiment Station.

The Unit is housed in the Forestry and Zoology Building, where it will share facilities and services with the College of Forest, Range, and Wildlife Management.
Extension Services

Director W. H. Bennett; Associate Directors J. Clark Ballard, Lloyd A. Drury; District Directors Marden Broadbent, Lloyd R. Hunsaker; Extension Home Economics Program Leader Margaret Merkley; Social and Economic Development Leader Stephen L. Brower; State 4-H Club Leader Glenn T. Baird; Associate State 4-H Club Leader Amy R. Kearley; Supervisor, Extension Class Division and Correspondence Division Bernice Brumley; Administrative Assistant Arthur Cahoon; Secretary to Director Libbie B. Maughan; 4-H Assistant LaRee Petersen; Bulletin Room Clerk Laura P. Cheney.

State Subject Matter Specialists

Agricultural Engineer Wayne B. Ringer; Agronomist Louis A. Jensen; Animal Husbandman Doyle J. Matthews; Clothing Specialist Theta Johnson; Coordinator-Instructors, University-Extension Civil Defense Program William F. Farnsworth and Wesley T. Maughan; Dairy Manufacturing Specialist A. J. Morris; Dairymen John Barnard; Entomologists George F. Knowlton and Reed S. Roberts; Economist Lloyd Clement; Forestry-Outdoor Recreation Specialist John D. Hunt; Foods and Nutrition Specialist Flora H. Bardwell; Graphics Artist L. Jay Smith; 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 Georgia Beth Smith; Extension Publications Editor Christian P. Nielsen; Marketing Specialists Morris H. Taylor and Paul R. Grimshaw; Marketing Information Specialist Carolyn Dunn; Ornamental Horticulture Specialist Arvil L. Stark; Poultry Specialists C. Elmer Clark, C. I. Draper; Radio and Television Specialist Arthur L. Higbee; Range Management Specialist Karl G. Parker; Recreation Specialist _______; Rural Civil Defense Leader Courtney H. Brewer; Sheep and Wool Specialist Russell R. Keetch; Soil Specialist Paul D. Christensen; Veterinarian Don W. Thomas; Water Use Specialist Richard E. Griffin; Wildlife Specialist Jack H. Berryman.

County Agricultural Agents

Beaver Grant M. Esplin; Box Elder A. Fullmer Allred, Ray H. Finch; Cache Lamont E. Tueller, G. Ray Burtenshaw; Carbon Ralph H. Horne; Davis L. Darrell Stokes, Lehi S. Rogers; Duchesne William L. Smith; Emery Gerald R. Olson; Garfield Harold G. Lindsay; Iron Wallace D. Sjoblon; Juab Lynn M. Esplin; Kane Harold Carl Hatch; Millard Marven J. Ogden, Jay M. Hall; Morgan Ray A. Thatcher; Piute Keith J. Chapman; Rich Evan Rudd; Roosevelt Wilford Lavon Day; Salt Lake Joseph R. Parrish, D. Wayne Rose, Melvin S. Burningham; San Juan Rell F. Argyle; Sanpete C. Dennis Funk1, Delbert C. Purnell; Sevier Rodney G. Rickenbach; Summit J. Reed Moore; Tooele Ernest O. Biggs; Uintah Ben W. Lindsay, Kay R. Bendixsen; Utah Clair R. Acord1, Joel C. Barlow, Robert L. Hassell; Wasatch Paul R. Daniels:

1On leave.
Extension Services

William H. Bennett, Director
Office in Agricultural Science 221

Utah State University's Extension Services include the Cooperative Extension Service, Extension Class Division, Conferences and Institutes Division and Correspondence Study Division.

Cooperative Extension Service

The Cooperative Extension Service is one of the main divisions of the University and in Utah is the educational arm of the U.S. Department of Agriculture. It was established in 1914 with passage of the Smith-Lever Act by Congress. The Extension Service is sponsored and financed jointly by federal state and county governments. There is a Cooperative Extension Service in the Land-grant institution of each state.

The main functions of the Cooperative Extension Service are: To develop human leadership, resourcefulness and initiative; to supply factual information for discovering and solving problems, and to help people become more efficient, increase the incomes and raise their standards of living. The Extension Service takes the findings of research to the people of the state and brings unsolved problems back to the research workers at the University for solving.

Extension programs are planned jointly with the people. The demonstration method of teaching and the mass media are used extensively. Farm and home visits, group meetings, personal and circular letters and publications are used to supply educational information.

Several administrative and supervisory personnel and 28 subject-matter specialists comprise the staff at the state office on the USU campus. In addition several specialists and program leaders are located out in the state.

County Extension Agents are lo-
350 Extension Services

cated in 27 of Utah's 29 counties. At present there are 38 agricultural agents, and 28 home agents.

To facilitate operations the state has been divided into districts and a District Director placed in charge of each district to handle budget and relations matters in the Districts and to supervise county Extension personnel.

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 are also held in cooperation with USU's Agricultural Experiment Station and other groups.

Extension Class Division, Conferences and Institutes Division, Correspondence Study Division

A large number of people living in communities or areas remote from the University campus desire to benefit from university training but cannot come to the home campus to register for resident courses. For this group, USU provides a liberal program of educational offerings, including Extension Classes, Correspondence Study and a number of other educational services. USU is a member of the National University Extension Association.

Extension Class Division

Courses offered by Utah State University are made available in approximately thirty different communities of the state for groups of people who cannot take advantage of residence study opportunities at the Logan campus. Such courses are designated as Extension Classes. They carry USU credit, are equivalent in content, hours of class instruction and preparation and otherwise meet the same prerequisites as comparable classes on the University campus.

Except for the 45 credits which must be earned in residence on the Utah State University campus, Extension classes may meet the requirements for a Bachelor's degree. Extension classes 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 approved by the head of the department, and by the University administration.

The registration fees charged for Extension classes conform to the prevailing regulations fixed by the Board of Trustees.

Conferences and Institutes Division

The University cooperates with a variety of organizations in plan-
ning and sponsoring educational conferences, institutes and short courses.

The foregoing activities are offered primarily for those not planning to earn a degree. The Conferences and Institutes Division wishes to serve individuals desiring academic stimulation, new skills, greater appreciation of fine arts and awareness of current national and international problems.

School districts are encouraged to organize teacher in-service and parent-teacher improvement programs.

Correspondence Study Division

Many individuals desire organized, systematic instruction, but live in isolated areas or for other reasons cannot meet for class instruction on the University campus or its resident centers. For such individuals, USU provides a liberal offering through a wide variety of Correspondence Study courses in many of the departments of the University. This program furnishes an excellent opportunity to students of high school or college level, and to adults 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 Correspondence Study courses of college grade.

High School students demonstrating superior ability may enroll for University Credit Courses.

One-fourth of the credits necessary for a Bachelor's degree (45) may be earned through Correspondence Study courses. Each college of the University, subject to faculty approval, determines the nature and the amount of correspondence study credit accepted for admission and graduation. In no case is more than 25 per cent of the total number of credit hours accepted for graduation to be Correspondence Study credit.

Graduation Deadline. Seniors who plan to apply Correspondence Study credits toward graduation, in any one year, must have their courses completed by May 1, so that lessons and examination may be evaluated and credit filed in the Admissions and Records Office two weeks prior to the day of graduation.

An enrollee is allowed one year in which to complete a course. An extension of time may be granted upon payment of a small fee.

USAFI Courses. USU is cooperating with the United States Armed Forces Institute (USAFI) at Madison, Wisconsin, by providing Correspondence Study courses at a reduced cost to men and women in active service in the Army, Navy, Air Force, Marine Corps, or Coast Guard. A member of any one of the armed forces desiring to enroll for Correspondence Study courses should contact that education and information center at the base where he is located.

Fees. A fee of $7.50 per credit hour is charged for Correspondence Study courses of college level. High School courses fees are $21 per unit and $15 per half-unit. All fees are subject to change.

Correspondence Study Catalog. If an individual is interested in Correspondence Study courses he may request a Correspondence Study Catalog, which contains full information concerning this program.
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 adjacent to Highway 89, at Ephraim, which is the geographic center of Utah.

Accreditation. Snow College is accredited by the Northwest Association of Secondary and Higher Schools.

Campus and Facilities. The main campus of Snow College consists of 45 acres including an athletic field, and 15 buildings. In addition to the main campus, Snow College cooperates with the Experiment Station in the operation of a 96-acre college farm.

Degrees and Certificates. Snow College is authorized to confer the certificates of Associate in Science and Associate in Arts upon 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.
ALUMNI ASSOCIATION
AND UNIVERSITY DEVELOPMENT
USU Alumni Association

W. Eugene Hansen, President
J. Lyn Larson, Executive Secretary
Office in Alumni Center, Student Union Building

Utah State University Alumni Association now numbers more than 33,000 members. These members are the graduates and other former students of Utah State, who are now keeping in touch with the University and supporting its activities through the work of the Association.

Purpose. It is the purpose of the Alumni Association to promote the interests and welfare of Utah State University.

Membership. (1) Regular Member: All persons receiving degrees, diplomas or terminal vocational certificates from Utah State University or Snow College are eligible for membership in the Association upon payment of dues. (2) Associate Member: All students who have been regularly enrolled in one of the two aforementioned institutions and have successfully completed any work therein, may become members of the Association upon payment of dues. (3) Sustaining Member: All parents of graduates or students and faculty members and others who have shown an interest in the University or the Association may become sustaining members by payment of dues. (4) Honorary Member: Persons eligible for honorary membership are those who have done outstanding service to the Institution and who are recommended for this honor by the Executive Committee, or the Council of the USU Alumni Association.

Dues. Annual dues are $5 per year and joint annual dues (husband and wife) $7.50 per year. Life membership may be obtained singly at $35, or $50 for a joint membership, both payable in five annual installments.

Government. The governing power of the Association is vested in the Alumni Council, composed of 15 elected members and ex-officio members. The current president of the Senior class and the president of the Associated Students' organization are both ex-officio members of the Council. The Alumni Executive Secretary is the official representative of the Association on campus. The President of the Alumni Association is a member of the Utah State University Board of Trustees, as provided by Chapter 5, Article 75-5-0, School Laws, State of Utah.

Function. The Alumni Association is the medium through which former students of Utah State are kept in contact and are served after leaving the campus. Efforts are made to maintain a complete record of every alumnus throughout life, and his accomplishments and progress are recorded. Members receive the Utah State Alumnus, an official publication of the Association, full of Aggie news and reports on the University. The Association maintains Alumni chapters in all major areas where Aggies are located. Through this local organization, Aggies are kept in contact with each other, and they meet and participate in business and social activities. They likewise assist the University with special projects in their areas. The Association endeavors to keep in contact with all Aggies and assists them in reference and contact problems.
Membership in the Association is the best way for an Aggie to demonstrate his interest and support of the University and its program after leaving the campus.

The Alumni Association takes the leadership in sponsoring such campus events as Homecoming and the Senior Reception, as well as aiding in athletic and other school events.

University Development Fund

Leron Johnsen, Fund Director
Office in Alumni Center, Student Union Building

A key part of USU’s Development program is a Development Fund, a non-profit corporation (established August 11, 1958) to encourage grants, bequests, and gifts of money, property, works of art, historical papers and documents, and museum specimens having educational, artistic or historical value. The Development Fund thus helps the University increase and improve its educational and other services.

A fifteen-man board of directors of this non-profit corporation represents five groups: USU Board of Trustees, Alumni Association, the University Administration and Faculty, the Associated Students and General Public.

Fund officers are: Rudy Van Kampen, chairman; J. K. Wheeler, vice-chairman; Dee A. Broadbent, treasurer; Leron Johnsen, 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.

Solicitation programs of the Development Fund include: the “Fair Share Formula” used in the Annual Alumni Gift; the Century Club and the Old Main Society which recognize large single donors to the University’s programs; and the Estate Planning Program for those wishing to bequeath property, securities, and money to the University in their wills.
FACULTY AND COLLABORATORS
Utah State University 1965-66 Faculty


ABRAMS, MILTON C. (1949) Librarian: Asso. Prof. and Head, Library Science. BS 1948, MS 1952 USU, PhD 1963 U of U.


ADKINS, BRYCE E. (1964) Asso. Prof. of Elementary Education. AB 1949 Peru St. Coll., MA 1954, PhD 1958 St. Univ. of Iowa.

AHLSROM, C. BLYTHE (1964) Instr. in History BA 1957, MA 1959 U of U.

ALDER, DOUGLAS (1963) Instr. in History BA 1957, MA 1959 U of U.

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, MS 1964 Colo St U.

ALLRED, KEITH REID (1957) Asso. Prof. of Agronomy. BS 1951 BYU, PhD 1955 Cornell U.

ANDERSEN, LADELL (1961) Head Basketball Coach; Instr. in Physical Education. BS 1951 USU.


ANDERSON, JAY O. (1951) Prof. of Poultry Husbandry. BS 1943 USU, MS 1948, PhD 1950 U of Maryland.

ANDERSON, JON F. (1964) Asst. Prof. of Fine Arts, RPA 1956 Art Center Sch.

ANDERSON, LOWELL Lecturer in Mathematics. MS.

NOTE: Date in parenthesis indicates year the person joined USU staff, not necessarily in present position.

*On leave.

ANDERSON, RICHARD C. (1963) Asst. Prof. of Chemistry. BS 1954, PhD 1961 BYU.

ANDERSON, ROICE H. (1947) Prof. of Agricultural Economics. BS 1939 U of Wyo., MS 1941, PhD 1943 Cornell U.

ANDERSON, WENDELL B. (1947) Prof. of Political Science. BS 1935, MS 1940 USU, LLB 1941 George Wash. U.

ANDERTON, KENNETH (1963) Instr. in English. BS 1962, MS 1964 USU.

ANDRA, JEAN S. (1964) Instr. in English. BS 1961, MA 1964 USU.

ANDRA, THEODORE (1962) Instr. in English and Journalism. BS 1961, MS 1962 USU.

ARAVE, CLIVE WENDELL (1964) Asst. Prof. of Dairy Husbandry. BS, MS USU, PhD U of Calif.

ARGYLE, RELL F. (1954) Asst. Prof., Extension Services; San Juan Co. Agent. BS 1940, USU, MEd 1964 Col St U.


BACON, MARY R. (1948) Asso. Prof., Extension Services; Wasatch Co. Home Agent. BS 1928 U of U, MS 1944 BYU.

BAGLEY, JAY M. (1955) Asso. Prof. of Civil and Irrigation Engineering. BS 1952, MS 1953 USU, PhD 1963 Stanford U.

BAHLER, THOMAS L. (1949) Prof. of Zoology, Physiology. BA 1943 C of Wooster, PhD 1949 U of Wis.

BAIRD, GLENN T. (1946) State 4-H Club Leader; Asso. Prof., Extension Services. BS 1935 USU, MS 1964 Univ of Md.

BAKER, DORAN J. (1959) Director, Electrodynamics Laboratory, Asso. Prof. of Electrical Engineering. BS 1953, PhD 1956 U of U.
BALLAM, ORAL L. (1963) Assistant to the Dean and Asso. Prof. of Education. BS 1949, MS 1956 USU, EdD 1961 UCLA.


BALPH, DAVID F. (1964) Asst. Prof. of Wildlife Resources. BA 1955 Hiram College Ohio, MS 1961, PhD 1964 USU.


BATTY, JOSEPH CLAIR (1963) Asst. Prof., Mechanical Engineering, BS 1961, MS 1963 USU.


BEACH, ERNEST E. Captain Military Science. BS Citadel.


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.


BEUTLER, G. LEON (1954) Asst. Prof. of Education. BS 1950, MS 1959 USU.

BÉYERS, JOHN M. (1957) Asst. Prof. of Languages and Philosophy. BA 1949, MA 1953 U of U.

BIGGS, ERNEST O. (1944) Asst. Prof., Extension Services; Tooele Co. Agent. BS 1926 USU.

BILLS, JUDITH C. (1962) Instr. in Business Administration. BS 1960, MS 1961 USU.

BISHOP, A. ALVIN (1946) Prof. and Head of Ag. and Irrigation Engineering. BS 1984, MS 1983 USU, PhD 1961 Colo. State U.


BLACK, THERAL R. (1950) Prof. of Sociology; Rural Sociologist. BS, MA 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.

BLASEK, LEROY A. (1952) Director of Public Services and Information; Asso. Prof. of Education. BS 1938, MS 1944 USU, EdD 1965 U of Calif.


BOENDER, MARY (1960) Asst. Prof., Extension Services; Duchesne Co. Home Agent. BS 1933 USU.


BOOTH, THORNTON Y. (1948) Liberal Studies; BS 1948 of Tech. Boston, PhD 1951 Stanford U.

BOYER, FAY (1960) Business Education. BS 1937, MS 1939 USU, PhD 1943 U of Calif.


BOYER, RICHARD (1960) Asst. Prof., Extension Services; Dairy Records Agent at Large. BS 1948, MS 1953 USU.

BUDGE, PEARL S. (1947) Asst. Prof. of Education. BS 1927, MS 1956 USU.


BULLEN, JOHN SAMUEL (1954) Asso. Prof. of English. BS 1950 USU, MA 1955 Stanford U PhD.

BULLER, PATRICK E. Asst. Res. Engr. in Elec. Engr. BS.

BURNETT, NOLAN K. (1958) Asst. Prof. in Health, Physical Education. BS 1950, MS 1958 USU.


BURTENSHAW, CLAUDE J. (1962) Dean of Students, Prof. of Political Science. BS 1946, MS 1948, PhD 1955 U of U.


BYLAND, BRUCE (1964) Asso. Prof. of Sociology. BS 1950, MS 1951 BYU, PhD 1954 Penn. St. Univ.

CAHOON, OWEN (1964) Instr. in Family and Child Development. BS 1963, MS 1964 USU.


CALL, ANSON B., JR. (1928) Asso. Prof. and Horticulture and Vegetable Crops Specialist, Extension Services. BS 1927, MS 1928 BYU.


CALLISTER, JOANN (1964) Instr. Extension Home Agent, Indian Program, Extension Services. BS 1964 BYU.

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<table>
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<tr>
<th>Name</th>
<th>Years</th>
<th>Degree/Title</th>
</tr>
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<tr>
<td>James, Raymond</td>
<td>(1959)</td>
<td>Asst. Prof. of Business Administration. BS 1948 SUU, MS 1952 New York U.</td>
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<td>Jarrett, Von H.</td>
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<tr>
<td>Jensen, Jay O.</td>
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<td>Jensen, George</td>
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<td>Jensen, Louis A.</td>
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<tr>
<td>Jensen, Naomi</td>
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