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Utah State Agricultural College
Logan, Utah

1956-57 Catalog Bulletin
# COLLEGE CALENDAR 1956-57

## Fall Quarter

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<td>Sept. 19, Wed.</td>
<td>First Faculty Meeting</td>
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<td>Sept. 20, 22 Th. S.</td>
<td>Orientation—New Students</td>
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<td>Sept. 21, Fri.</td>
<td>Registration—New Students</td>
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<tr>
<td>Sept. 22, Sat.</td>
<td>Registration—Former Students</td>
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<td>Sept. 24, Mon.</td>
<td>Instruction Begins</td>
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<td>Oct. 27, Sat.</td>
<td>Homecoming</td>
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<td>Nov. 28, Wed. n.</td>
<td>Thanksgiving Recess Begins</td>
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<td>Dec. 17, Mon.</td>
<td>Examination Period Begins</td>
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<td>Dec. 20, Thr. n.</td>
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<td>Jan. 2, Wed.</td>
<td>Winter Registration</td>
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<td>Jan. 3, Thr.</td>
<td>Instruction Begins</td>
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<td>Mar. 18, Mon.</td>
<td>Examination Period Begins</td>
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<td>Mar. 21, Thr. n.</td>
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<td>Mar. 26, Tues.</td>
<td>Instruction Begins</td>
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<tr>
<td>May 27, Mon.</td>
<td>Examination Period Begins</td>
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<tr>
<td>May 30, Thr.</td>
<td>Memorial Day Holiday</td>
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<tr>
<td>May 31, Fri. Ev.</td>
<td>Baccalaureate</td>
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<td>64th Commencement</td>
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<td>Registration</td>
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<td>June 11, Tues.</td>
<td>Instruction Begins</td>
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<tr>
<td>July 4, 5, Th. F.</td>
<td>Holidays</td>
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<tr>
<td>July 13, Sat.</td>
<td>Classes Held</td>
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<td>July 19, Fri.</td>
<td>First Session Ends</td>
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<td>July 22, Mon.</td>
<td>Second Session Begins</td>
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<tr>
<td>July 24, Wed.</td>
<td>Holiday</td>
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<td>Aug. 16, Fri.</td>
<td>Second Session Ends</td>
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2. Information Service and Alumni Association
3. President's Home
4. Smart Gym
5. Forestry Bldg.
6. Boiler House
7. Widtsoe Hall
8. Chem. Class Rooms
9. Union Bldg.
10. Music Bldg.
11. George Nelson Fieldhouse
12. Military Bldg.
13. Stadium
15. Maintenance Bldg.
16. Co-op House
17. Nursery
18. O.R.C. Bldg.
20. Technology Bldg.
21. Judging Pavilion
22. Rural Arts Bldg.
24. Lund Hall
26. Library
27. Plant Industry Bldg.
29. Commons Bldg.
30. Engineering Bldg.
31. Mechanic Arts Bldg.
32. Commercial Est.
33. L.D.S. Institute
34. Alpha Chi Omega House
35. Kappa Delta House
36. Pi Kappa Alpha House
37. Sigma Chi House
38. Chi Omega House
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   Director Emeritus, Extension Service

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   Professor Emeritus, Extension Service

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   Professor Emeritus, Extension Service
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    President

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    Associate Professor
    College Librarian

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Allen, Bert V.
    Head, Department of Photography
    Instructor in Photography

Allred, A. Fullmer, B.S.
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Ames, Ralph W., B.S., Ph.D.
    Professor of Botany and Plant Pathology
    Head, Botany and Plant Pathology

Anderson, Jay O., B.S., M.S., Ph.D.
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Anderson, Roice H., B.S., M.S., Ph.D.
    Associate Professor of Agricultural Economics

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    Associate Professor of Political Science

Angus, Robert, Major
    Assistant Professor of Air Science

*Arrington, Leonard J., B.A., Ph.D.
    Associate Professor of Economics

Bacon, Mary R., B.S.
    Associate Professor, Home Demonstration Agent, Wasatch County

Bagley, Jay M., B.S., M.S.
    Assistant Professor of Irrigation and Drainage

Bagley, Royal A., B.S., M.S., D.V.M.
    Assistant Professor of Veterinary Science

Bahler, Thomas L., B.A., Ph.D.
    Associate Professor of Zoology

Baird, Glenn T., B.S.
    Associate Professor, State 4-H Club Leader

Baker, H. Cecil, B.S.
    Associate Professor, Head Basketball Coach

Balding, Lawrence M., T/Sgt.
    Records NCO, Department of Air Science

Bardwell, Flora H., B.S.
    Assistant Professor, Home Demonstration Agent, Garfield County

*On Leave
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<thead>
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<th>Degree</th>
<th>Title and Notes</th>
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Rigby, Eldro, Manager of Campus Farm

Roberts, Joseph, Superintendent of Buildings

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INTRODUCTION

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UTAH State Agricultural College is in Logan, Cache County, a typical college town of 16,000 inhabitants. Highways 89 and 91 intersect at Logan, and the town is served by the Greyhound bus lines, Western Air Lines, and the Union Pacific Railroad for freight service. The College is located one mile east of the business section of Logan on a hill overlooking the valley.

POLICY

Utah State Agricultural College in its fundamental policy has always considered the main function of education to be the preservation and improvement of the democratic way of life.

The College, in its seven schools of instruction provides a liberal, thorough, and practical education. In addition to the strictly practical courses, students are given excellent training in the sciences, mathematics, history, English, art, music, speech, modern languages, and related subjects.

Under this general policy, the special purpose of the College is to serve in building the State and the great West to which it belongs.

The Constitution of Utah establishes Utah State Agricultural College and the University of Utah as the two State institutions of higher learning. These institutions are independent in government, but each is part of the public school system. Each, under the Constitution and the Statutes of Utah and in harmony with the ruling of its governing board, offers undergraduate and graduate studies leading to Bachelor's, Master's and Doctor's degrees. The College, in addition to this high status given it in Utah under the Constitution, is one of the fifty-one Land-Grant institutions in the United States designated by the Federal Government as the institutions of higher learning in the respective states for the development of the Federal program of education included in the Morrill and Nelson Acts of the Federal Congress.

HISTORY

Utah State Agricultural College, with its Experiment Station, and Extension service exist today because of far-sighted legislation that created, stated the purposes, and set forth the fields of activity of these divisions. The Morrill Act (1862) provided for establishment of Land-Grant Colleges by the grant of Federal lands to provide a material basis for these institutions. Utah received 200,000 acres. The Second Morrill Act (1890) carried an annual appropriation to each college, the sum to be spent for instruction in designated subjects. Additional Federal legislation that increased financial aid to the institution includes the Hatch Act (1887), for experimental purposes; the Smith-Lever Act (1914), to aid in beginning and developing extension work; more recently, the Bankhead-Jones Act, which supports all three divisions in some degree. All these acts constituted the basis of Federal participation in the extension of college education and rural agricultural development to the masses of American people. Participation by the Territory of Utah in this Federal program came through passage of an act "to establish an Agricultural College and an Agricultural Experiment Station," introduced into the legislature by Representative Anthon H. Lund on February 27, 1888, and signed by Governor Caleb West, March 8, 1888.

The college was chartered as the Utah Agricultural College, but the name was changed in 1929 to Utah State Agricultural College. It is accredited by the Northwest Association of Secondary and Higher Schools and is on the accepted lists of the Association of American Universities and of the American Association of University Women.

The Federal Land Grant Act of 1862 explained that the colleges were, "without excluding other scientific and classical studies and including military
tactics, to teach such branches of learning as are related to Agriculture and the Mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.” The Territorial Act of 1888 confirmed these purposes and defined the fields of instruction offered by the college to include “the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy, physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and mechanical arts to the practical agriculture in the field.”

Since its beginning in 1890 ten presidents have guided the destinies of the college. Following President J. W. Sanborn came President J. H. Paul in 1894, President J. M. Tanner in 1896, President W. J. Kerr in 1900, President John A. Widtsoe in 1907, President E. G. Peterson in 1916, Dr. Franklin S. Harris in 1945, Dr. Louis Linden Madsen in 1950, Dr. Henry Aldous Dixon in 1953, and Dr. Daryl Chase in 1954. From one building in 1890, the number of major buildings has reached forty, plus many smaller and temporary buildings.

The Branch Agricultural College of Utah was established in 1897 as the Branch Normal School of the University of Utah. Growing need for agricultural development in southern Utah resulted in a change of administration whereby the normal school became a branch of the Agricultural College. The name of this Branch was changed to College of Southern Utah by action of the Board of Trustees in June 1953.

Since 1936, CSU has been authorized to offer Senior Division courses in agronomy, animal husbandry, and agricultural economics and related studies. This provision enables students in agriculture to complete studies for the B.S. degree in these departments with one year of additional work on the campus at Logan. In 1948, additional courses in elementary teacher training leading to the B.S. degree in Education were authorized by the Board of Trustees.

Both the Extension Service and the Agricultural Experiment Station are closely connected with CSU. Certain members of the resident staff at Cedar City are also members of the staffs of these two divisions. Deans of the parent institution supervise the work of the corresponding divisions at the Branch, and course offerings closely parallel those offered on the Logan campus.

Snow College, established in 1888 by the Latter-day Saint Church as an academy, officially became part of the Utah State Agricultural College by action of the Utah state legislature in 1951. It had been accredited as a state junior college in 1932.

Courses offered on the campus at Ephraim generally parallel similar courses offered by the Lower Division at Logan, and co-operative effort is steadily increasing the integration of these offerings. Deans of the parent institution at Logan supervise work in the corresponding divisions at Snow College.

PHYSICAL PLANT

The physical plant of the College, built over a period of half of a century, comprises one of the most beautiful college campuses in America. It occupies nearly one hundred acres on a large delta at the mouth of Logan Canyon, which cuts through the Bear River range of the Wasatch Mountains. The views from College Hill in every direction afford pleasing vistas.

BUILDINGS AND FACILITIES

To house its varied and growing educational and research activities, the College now has more than 70 buildings on the campus.

Main building, a three-story brick structure, is the prime landmark in the history of the institution. Its halls and classrooms have resounded to classes
coming and going for more than 60 years. In it are located the administrative
and the business offices of the college and the departments of Fine Arts,
Geology, Landscape Architecture, Mathematics, Modern Languages, Psy-
chology, Sociology, Speech, Zoology and the schools of Humanities and Sciences,
Education, Business and Social Science, the Graduate School, Summer School
and the Division of Off-Campus Instruction. The Main Auditorium in the
East wing has been completely remodeled. New theater seats of the best
quality have been installed, along with a completely new sound system. Pro-
visions have been made for proper ventilation. It thus affords excellent facili-
ties for student gatherings, assemblies, and the presentation of college plays.
A studio theater, used by the speech department, and the broadcasting studios
of radio station KVSC are on the second floor of the north wing.
The combination Home and Family Living and Commons building located
at the southeast corner of the quadrangle provides facilities for social and
cultural activities of both faculty and students. It also houses the Home
Economics Library, with nutrition research laboratory on the lower floor.
Additional Home Economics research laboratories, kitchen, and nursery school
are located in the area formerly occupied by the Cafeteria. Educa-
tionally, this structure functions as the quarters of the School of Home and
Family Living and the department of Physiology. These departments both
have modern, well-lighted classrooms and laboratories; all equipped with
standard, scientific equipment.
The Thomas Smart gymnasium is the center of much athletic activity. It
houses offices of the department of Health, Physical Education and Recreation,
indoor and intramural sports, and a swimming pool.
The Field House, a spacious steel and brick structure, 356 feet long by
137 feet wide, completed in 1939, is used for many activities. It is the center
of College competitive athletics, and is used for other large college and public
gatherings, including commencement activities, numerous concerts, and mili-
tary functions. It is equipped with an excellent basketball playing floor and
a seating capacity of 6,500. For indoor tennis, track, softball and football
practice, the building is ideal.
A companion building to the Field House is the Military Science building.
This brick-concrete structure is provided with excellent offices, classrooms,
riple ranges, gun and equipment supply rooms. The gun shed now houses four
modern classrooms, security room for arms and equipment, and additional
supply rooms. The combination of this building and the Field House makes
possible military training the year around.
The Information Services and Alumni building is now headquarters for
The Alumni Association and the expanded public information and publications
center on the campus.
Widtsoe Hall is wholly occupied by the departments of Chemistry, Physics
and Experiment Station laboratories. Chemical and physical laboratories are
furnished with ample facilities and scientific equipment for student training
and research.
The Animal Industry building is occupied by the departments of Animal
Husbandry, Poultry Husbandry, Dairy Industry, Horticulture. Besides labora-
tory and classroom facilities for the study and teaching of dairy manufac-
turing, animal and poultry nutrition, breeding and wool technology, this
building houses a modern cheese, and ice cream manufacturing plant, and a
dairy bar, used for practical training in dairy products manufacturing.
The Plant Industry building houses the departments of Agronomy, Bac-
teriology and Public Health, Botany and Plant Pathology, and the large In-
termountain Herbarium.
The Engineering building is headquarters for the School of Engineering
and Technology. In this building, all the college courses in Civil Engineer-
ing including Surveying, Mechanical Drawing, Hydraulics, Irrigation and
Drainage, Municipal and Agricultural Engineering, are taught. This building
houses the Hydraulics, Irrigation, Soil Mechanics, Agricultural Engineering
and drafting and design laboratories.
The Mechanic Arts building houses shops of the School of Engineering
and Technology, laboratories for work in the technology of Forging, Indus-
trial Education, Radio, Machine Practice, Electronics, Sheet Metal, Welding,
Woodwork and Building Construction. Much new equipment has been added to the shops during the past five years.

The Library building, academic and cultural center of the College, is located on the east side of the quadrangle. The department of English is using the top floor for its classes because of the convenient access to library stacks. It houses the Hatch Memorial library. Much of the furnishings of this Library are of old English origin which came directly from England with the original coat of arms. The material deposited in this Library is divided in four sections as follows: Hatch, Utahnalia, Art Books, and Rare Books. This makes a very fine contribution to our library offering.

The Forestry building contains classrooms, laboratories and specimen museums provided with equipment and all facilities for complete training in Forestry, Range, and Wildlife management. In connection with the Forestry School, the College conducts a forestry Summer School at its own camp, located in Logan Canyon about 20 miles northeast from the college.

The Child Development laboratory, located on the east side of the campus, is provided with outdoor space well supplied with playground equipment. The School of Home and Family Living has a Home Management house just west of the campus.

The new Student Union building has fulfilled a great need on the campus. The social and recreational center of the campus, it is a very spacious building housing the student body offices and publications, cafeteria, College book store, coffee shop, barber shop, photo shop, bowling alleys, game rooms with pool and tennis tables. There are two large ballrooms for dancing and movie projection. The cafeteria and coffee shops are equipped with the most modern equipment.

A new Agricultural Sciences building was erected on the campus to house the Administrative offices of the Agricultural Experiment Station and Utah Extension Service. It also has classrooms and laboratories equipped with the finest of equipment.

Five new tennis courts have been built just east of the stadium. These courts will satisfy the growing need for such facilities on the campus.

The college barns and livestock have been moved from the campus to the modern farm located approximately two miles north of the campus, with the Turkey farm approximately two miles north and east of the campus. A new modern milking parlor has been built on the dairy farm north of the campus where the most modern facilities for handling milk have been installed.

The new Poultry Plant is now north of the campus adjacent to the dairy farm. It is built on the colony plan, is equipped for class and experimental research work in poultry husbandry. College flocks include all important breeds of domestic fowls. The plant is equipped and extensively used for study and research on the best methods of feeding, housing, and disease control to obtain the most economical production.

The Veterinary Science building has office space, a well-equipped dispensary, operating rooms, stalls for animals, and modern equipment for training and scientific work in Veterinary Science and Medicine. A veterinary clinic is periodically conducted.

An extensive Technology building with shops and facilities for Aeronautics, Automotive and other technical training was completed in 1948.

In 1949 a well-equipped Maintenance building was completed to house the Buildings and Grounds department. This building houses the maintenance shops of the College including plumbing, carpentry, electricians, painting, and automotive repair as well as storage rooms and offices of the department.

LABORATORIES

The numerous College laboratories are provided with satisfactory working facilities. The equipment is generally complete, and extensive experimental research is carried on by both faculty and advanced students. Recent important acquisitions include an electron microscope, a spectograph, and an ultracentrifuge.
The College Library system consists of the Main Library and nine branches: Home Economics, Engineering, Forestry, Hatch Memorial Library, Claypool Map, Moore Children's Library (temporarily housed with the Home Economics), Whittier, Browsing, and Audio-Visual Aids Library. All are centrally administered and centrally cataloged; that is, all the material in all the branch libraries is recorded in the master catalog of the main library; thus all material, regardless of form, is readily accessible. Each branch is located in the same building as the school it serves.

Holdings of the libraries include the necessary tools for communication and study. These include books, periodicals, public documents, pamphlets, maps, films, micro-films, and recordings. For all forms, a generous loan policy is in effect, limited only by those restrictions that are necessary to insure the preservation and continued use of the materials.

The Library is a depository with the U. S. Superintendent of Documents to receive all publications printed on the condition that they be made available to the public. Further, the documents division is on the mailing list of the important federal bureau and agencies for additional series not available through the Superintendent of Documents. It also has an exchange agreement with universities, experiment stations, and extension services of all states to receive their publications.

Patrons interested in music find the Music Library, established by a Carnegie grant and maintained in the Browsing Library in the Union Building, a worthwhile feature. The collection has music for every taste, classic and popular. Speakers and headphone sets are maintained for library users.

The new picture collection is a special feature of library service. It has pictures of plant and animal life, famous persons, pictorial histories, famous paintings, and many other interesting pictures, many of which are mounted and laminated for use in display and teaching.

Persons interested in rare books find many interesting items in the Hatch Memorial Library located in the Main Library. Here, books are available for use in the room, but are not subject to loan.

The Claypool Map Library, located in the Geology Museum, now has a collection of 13,000 maps. These maps were obtained from several governmental agencies and from commercial firms. The Library now has about 8,000 maps in the Topographical Quadrangle Series, one of the largest collections in the state.

The Audio-Visual Aids Library, housed in the Main building, includes films, filmstrips, microfilms, and other audio and visual materials. This library serves as a depository for USDA and other governmental agency films. Projection and recording equipment, as well as recreational films, are available for use by students, faculty, extension workers, research personnel, and social, civic, and church groups.

Interlibrary loan facilities are available for persons doing advanced research that necessitates the study of dissertations, books, or foreign publications unavailable through other means.

The Library maintains a bindery to bind its own books and periodicals.

The Library is open to students, faculty, and residents of the State of Utah practically every day in the year except legal holidays. Books, films, filmstrips, or microfilms may be borrowed directly from the library or, upon request, by mail.

HERBARIUM

The Intermountain Herbarium was established in 1932 by action of the Board of Trustees. Its function is largely to serve as the repository of plant materials obtained by field exploration, gifts, and exchanges with other institutions; materials that constitute the basis upon which the rich native vegetation of Utah and the Intermountain Region is receiving scientific, economic, and
The results of the herbarium researches are published as technical articles in scientific journals and economic and popular bulletins and circulars released by the Utah Agricultural Experiment Station. Most plant species that grow in Utah and the Intermountain Region are represented in the herbarium.

The herbarium is the depository of a branch of the College Library; it receives literature dealing with floristic botany and descriptive taxonomy.

Graduate study in plant taxonomy offered by the Department of Botany utilizes the extensive facilities of the herbarium. These graduate studies may entail thesis researches of a phytographic, revisionary, or floristic nature.

The herbarium facilities are available, by arrangement with the curator, for consultation and research by qualified members of the College Staff, students, collaborating agencies, institutions and members of the community.

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

USAC ALUMNI ASSOCIATION

George D. Clyde, President
LeRoy A. Blaser, Executive Secretary

The Utah State Agricultural College Alumni Association now numbers more than 20,000 members. These members constitute the graduates and former students who have been in attendance here at Utah State, and who are now making an effort to keep in touch with the college and support its activities through the work of the Association. Many of these members now hold important positions in industry and government.

Purpose. It is the purpose of the Alumni Association to promote the interests and welfare of Utah State Agricultural College.

Membership. (1) Regular Member: All persons receiving degrees, diplomas or terminal vocational certificates from Utah State Agricultural College, College of Southern Utah, or Snow Branch are members of the Association upon payment of dues. All graduating students of USAC receive a paid-up, two-year membership in the Alumni Association. (2) Associate Member: All students who have been regularly enrolled in one of the three aforementioned institutions and have successfully completed any work therein, may become members of the Association upon payment of dues. (3) Sustaining Member: All parents of graduates or students and faculty members and others who have shown an interest in the College or the Association may become sustaining members by payment of dues. (4) Honorary Member: Persons eligible for honorary membership are those who have done outstanding service to the Institution and who are recommended for this honor by the Executive Committee, or the Council.

Dues. Annual dues are $2.00 per year and joint annual dues (husband and wife) $2.50 per year. Life membership may be obtained singly at $25.00 or $35.00 for a joint membership, both payable in $5.00 installments.

Government. The governing power of the Association is vested in the Alumni Council, composed of 15 elected members and ex-officio members. The current president of the Senior class and the president of the Associated Student organization are both ex-officio members of the Council. The Alumni Executive Secretary is the official representative of the Association on campus. The President of the Alumni Association is a member of the Utah State Agricultural College 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 the former students of Utah State are kept in contact and are served after leaving the campus. Efforts are made to maintain a complete record of every alumnus throughout life, and his accomplishments and progress are recorded. Members
receive the Utah State ALUMNUS, a magazine published nine months a year, full of Aggie news and reports on the College. 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 College 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 College and its program after leaving the campus.

The Alumni Association takes the leadership in sponsoring campus events such as Homecoming, Founders' Day, and the Senior Reception, as well as aiding in other athletic and school events.

Alumni Association-Library Endowment Fund. The Library Endowment Trust Fund is a special fund which has been established by the Association. This fund was established from popular subscriptions. Earnings from the funds are given to the College library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.

“A” Men’s Athletic Association
John Broberg, President. Glen Worthington, Secretary

The purpose of this organization is to foster a sound and healthy spirit of co-operation between the former letter-winning athletes of Utah State Agricultural College and the College, and to promote the spirit of good fellowship among the former letter winners.

The “A” Men’s organization sponsors a banquet-dinner meeting for all its members in connection with the annual Homecoming game.

PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE

The Professional Relations and Faculty Welfare committee, authorized by the Board of Trustees and the Administration and elected by the Faculty, represents the Faculty on matters pertaining to professional relationships and welfare. Members of this committee at present are Carroll I. Draper, Chairman, Melvin Cannon, Glenn T. Baird, William H. Bennett, C. Wayne Cook, T. M. Burton, M. J. Harmon, Delbert Greenwood, Marden Broadbent, Clayton Clark, Israel Heaton, Una Vermillion, Ina Doty, Secretary.

Academic Regulations

For purposes of administration, the College is divided into the following major divisions: (1) the Academic, which is administered through seven schools; (2) the Graduate School; (3) the Research, administered through two Experiment Stations; (4) the Division of Off-campus Instruction, including the Correspondence and off-campus classes; (5) the Summer Session; and (6) the College of Southern Utah at Cedar City; (7) the Snow College branch at Ephraim. The academic regulations apply to all instructional work at regular session, summer session, correspondence and off-campus classes.

ADMISSION

Prospective students are urged to send official transcript of their credits to the Registrar at least four weeks before the opening of school.

Entrance with college standing is based upon (a) graduation from an accredited high school or (b) if applicant is over 18 years of age, and upon presentation of fifteen approved high school units of work or (c) by examination of those students 18 years of age or older who have had other training.
Students who have not been graduated from high school and who are presenting fifteen approved units for entrance may include one unit of credit for military science or one unit of physical education, but not more than one unit in combination.

Entrance by examination is based upon two types of tests developed by the U. S. Armed Forces Institute or other comparable tests approved and recommended by the American Council on Education. First, the tests of general educational development which are designed to measure the extent to which all of the educational experiences of the applicant for admission have contributed to his ability to "carry on" in a program of general education, or to his educational development to the type which might otherwise have resulted from attendance in a regular high school. Second, Subject Examinations: Each of these subject examinations may be used to determine whether the achievement of the applicant for admission is the equivalent of that expected of regular high school students for satisfactory completion of a corresponding course of classroom instruction.

Students who do not otherwise meet the entrance requirements are required to take the General Achievement Test. A student who fails this test because of extenuating circumstances prevailing at the moment may, upon recommendation of the Examiner, be admitted conditionally and permitted to take an alternative test sometime during the first quarter and thereby establish college standing as of date of original entry.

No credits obtained prior to the time at which college standing was established can be used toward a degree, except that where the amount of high school deficiency is so small that it requires but part of the student's time to carry courses to remove high school deficiencies, the remainder of the student's time may be spent on college courses and the credit so earned may be accepted to satisfy degree requirements. Students under 18 years of age may not enter with a high school deficiency.

The following suggestions emphasize the desirability of including various studies in the high school program of the student who plans to enter college:

1. English. Since the ability to write clearly and to read with understanding and appreciation is essential, it is highly desirable that the student complete three or four units in English.

2. Mathematics. Not only as a tool to further learning, but as a means of providing basic education, mathematics has much to offer. Two years of such study would be profitable. Students planning to specialize in the sciences or in engineering should complete two or more units in mathematics in high school.

3. Social Studies. Social studies—such as history, civics, government, economics, sociology and geography—are basic to the understanding and solution of contemporary problems in the community, in the nation, and in the world. From two to four units may well be devoted to this area by the prospective college student.

4. Natural Sciences. This field is rich in possibilities for understanding the modern world. Two units in science might well be completed. For those who plan to emphasize science or engineering in college, three units are helpful.

5. Foreign Languages. The prospective college student might well develop a basic reading or speaking knowledge of a modern foreign language. Some background in one of the classical languages would also be desirable.

6. Fine Arts. This field offers opportunity for development in an area of general education which can contribute much toward individual growth.

7. Other Subjects. None of the foregoing statements should be interpreted as meaning that other subjects—agriculture, commercial subjects, home economics, industrial arts, speech, etc.—should be avoided by the student who is planning to attend college. Such subjects, when properly studied, contribute materially to the educational growth of the individual and prepare him for continued study as well as for more general activities of living.

Students who expect to become candidates for any degree or diploma from any of the schools of the College must include among the units presented those
preparatory courses specified as prerequisite to beginning college courses in the various fields. Such students are urged to give serious thought to the selection of a major field of interest. Each student in cooperation with his parents, high school principal or other high school advisor should plan the high school program of students so as to meet the requirements for admission to his chosen field of interest. Students who fail to do this may expect to be delayed in starting their college work until the prerequisite courses are made up. Not all of the schools and departments of the College have specified prerequisites, but those which do have, list them in their school and departmental section in this College catalog. This information should be used in planning the high school course.

Transfers from Other Colleges (Advanced Standing). The College does not grant collegiate credit for excess high school work. Advanced standing for work of satisfactory grade done in some other accredited college, after the completion of 15 units of high school work, may be granted by the Committee on Advanced Standing, provided the student presents satisfactory evidence that the work offered is equivalent to the work for which he wishes to substitute it.

Advanced standing credits, when evaluated, are accepted on a provisional basis only, and are not included on a transcript of college credits until after the requirements for the degree toward which the credits are to be applied have been completed. Transcripts submitted for valuation become the property of the Institution, and are not returned. Transcripts should be sent to the Registrar four weeks in advance of registration. It is necessary to have them evaluated before registration, to arrange the course of study properly.

Provisions for Education of Veterans. Utah State Agricultural College has a broad and diverse curriculum. This makes possible the training of ex-service men and women for many occupations and at the same time provides ample opportunity for general education.

The College has made special provision for entrance, vocational advice, acceleration, and curriculum adjustments for these men and women.

It is possible, on the basis of evidence of educational growth since leaving high school and by the demonstration of aptitude for college work on tests for this purpose, for students to enter the College without completing all high school requirements.

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 rank; and 136 credits for Senior rank. The foregoing figures include the required credits in Physical Education or Military Science.

Registration: On each registration day, students will be 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 the 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 student has presented his fee card at the cashier's window, office of the Controller, and has paid his fees and filed his registration cards with the Registrar's office.

Penalties for Late Registration and Late Registration Fee: $5.00 beginning second day after specified Registration Days; additional $1.00 for each additional day up to a maximum of $10.00.
Reduction in load: The amount of work for which any student will be allowed to register will be reduced by one and one-half credits for each week, or fraction thereof, that he is late in registering.

Final Deadline for Registration and Course Changes: No student will receive credit for resident work unless he is officially registered for the specific courses involved. Course changes, adds or drops, may be made through the third week of the quarter. Thereafter, through the seventh week only, courses may be dropped from but not added to the study list.

The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's office, is considered to be the student's official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official change-of-registration form is filed with the Registrar's office before the deadline (end of the seventh week), an "F" grade will be recorded in case of failure to obtain a passing grade or an incomplete in any course for which the student has registered, regardless of the reason for the failure.

Regulations Pertaining to Withdrawal From Classes: Partial withdrawal: During the first three weeks of any academic quarter a student may withdraw from a class on his own initiative with the consent of his adviser and the instructor of the class.

Between the beginning of the fourth week of any academic quarter and the deadline specified above, withdrawal from a class is not permitted except when circumstances beyond the control of the student exist. The dean of the school in which the 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 Registrar's office.

In the event that students register for a class which is later cancelled out, it is the responsibility of the teacher to notify the Registrar's office and to return the class roll cards to the Registrar's office so that the students concerned can be properly withdrawn from the class.

Complete Withdrawal: If for any reason the student finds it necessary to leave the campus before the end of the quarter, he should take the necessary steps to cancel out his registration. The procedure to be followed in canceling out the registration is as follows: (1) Call at the Registrar's office for the necessary blank forms. (2) Go to the office of the Dean of Students to obtain approval for withdrawal. (3) Obtain from each instructor the class enrollment card and present at the Registrar's office the withdrawal permit form signed by the Dean of Students, together with the class cards for all classes in which enrolled. (4) Obtain authorization from the Registrar's office for any refunds which may be available. (5) Present refund authorization to the cashier's window, office of the Controller.

Unless the student is doing passing work in all of his classes at the time of withdrawal he may be denied the privilege of canceling out his registration. In case a student leaves the campus without obtaining permission for cancellation of registration, "F" grades will be recorded if sufficient work has not been completed to warrant the reporting of passing grades.

Additions to Registration: An addition to the original registration can be effected on the official change-of-registration form. The approval of the teacher concerned and the student's adviser must be obtained and indicated by signatures on the change-of-registration form before the card will be accepted in the Registrar's office. Between the beginning of the fourth week of any academic quarter and the deadline after which no changes can be effected, any additions to the original registration must be approved by the dean of the school in which the student is registered as well as by the instructor of the class and the student's adviser.
Change-of-Registration Fee: No charge for the first five school days after regular registration days. $1.00 for each class change made thereafter.

Visitor's Permit: Students who wish to attend regularly any class for which they are not registered must obtain a visitor's permit from the Registrar's office. No credit will be allowed for such attendance. A fee of $5.00 per class is charged for the privilege of auditing. Visitor's permit forms may be obtained from the Registrar's office. These forms include an authorization to the instructor for admitting the students to the class. These forms, properly executed, must be submitted to the Registrar's office before attendance at a class should be permitted.

Importance of Submitting Forms to the Registrar's Office: The special change-of-registration form, properly executed, must be filed at the Registrar's office 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 Registrar to record an "F" grade! Attendance at classes without proper approval and without official registration as defined above, and before the 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 herein prescribed for admission to classes.

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

Maximum Registration without approval for excess credit is set at seventeen quarter hours exclusive of one credit in basic Military Science or basic Physical Education. Only the dean of the school in which the student is registering has authority to approve registration in excess of this maximum. A student is not allowed to register for less credit than that listed for a course in order to bring the total registration within the maximum limit as herein defined. The registration is construed to include any extension, correspondence, institute, or other work carried by the student for credit, or for removal of high school deficiencies during the period of the school year.

Minimum Registration: The minimum registration for a full-time student load is usually considered to be twelve credit hours. To be eligible for student body offices a student is required to be registered for twelve quarter hours or more. Veterans are required to be registered for fourteen quarter hours or more to qualify for full subsistence. Students deferred by the Selective Service system under 1 SC status are required to maintain an average of fifteen credits per quarter.

Incomplete Work: Students are required to complete by the end of the quarter all courses for which they have registered. This includes correspondence courses for which the student may be registered on the residence registration fees. Incomplete grades can be granted by an instructor only when permission is granted by the Deans before the close of the quarter. The necessary petition form may be obtained at the Registrar's office. Incomplete work must be finished, and a passing grade be given in the course, within one year of the close of the quarter; otherwise the credit is forfeited.

Low Scholarship and Probation: Students who have not maintained an average grade of "C" or better, and students failing to obtain passing grades in twelve or more credits during the preceding quarter are automatically placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the student body organization. Students in the low scholarship group may be placed on probation for poor scholarship. Students on probation who violate the terms of their probation are subject to immediate suspension from the college. When in doubt regarding any of the regulations affecting them, students on probation should consult with the Dean of the school to which they belong. The Dean alone
has authority to waive or modify terms of probation. Students in the low scholarship group may not register for more than 15 credits per quarter exclusive of one hour of Physical Education or Military Science.

All classes are conducted as scheduled until 5 p.m. on the day preceding a holiday. Likewise all classes are conducted as scheduled the day following a holiday.

Credit by Examination: In special cases, students may be permitted to obtain college credit by passing examinations in subjects not taken in course. Credit for a subject taken in 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 college.

A maximum of 18 quarter hours' credit can be acquired by special examination. None of the last 30 credits presented for a B.S. 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 student's load for the quarter.

Credits earned by special examination are accepted on a provisional basis only, and are not included on a transcript of college credits until after the requirements for the B.S. degree toward which the credits are to be applied have been completed. Credits earned by special examination cannot be used for satisfying the requirements for the Master's degree nor for certification.

Request for permission to take special examinations should be made to the Committee on Special Examination on forms to be obtained at the Registrar's office.

A student may earn as much credit in the two-week Christmas holiday period as in a similar period in residence, without having it added to his load the preceding or following quarter.

Numbering of Courses: The collegiate work of the Institution is divided into three divisions: Lower Division, Upper Division and Graduate. Courses numbered from 1 to 99, inclusive, are Lower Division courses. Those listed from 100 to 199, inclusive, are Upper Division courses. All courses with number 200 or over are graduate courses.

Qualified students may enter courses in any quarter unless a statement to the contrary appears in the description of the courses.

Lower Division students are not allowed to enter Upper Division courses except upon approval of the Dean or Adviser and the instructor of the course.

LOWER DIVISION

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 students for the major work upon which they 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.

Students who expect to become candidates for the Bachelor's degree should plan their courses with great care through consultation with their faculty advisers, major professors, and deans, to insure the best choice of courses for filling the groups and to provide the proper foundation for their advanced work. Failure to do this may necessitate an extra year to complete the work for the desired degree.

Students should satisfy the following requirements, in order to complete the work of the Lower Division:
1. Remove any deficiencies that may exist in the entrance requirements.
2. Complete 96 credits, or quarter hours of work (including Military Science and Physical Education) with an average of 75% or higher.
3. Prepare a foundation of at least 15 credits for the field of specialized study in the Upper Division.
4. Satisfy the (A) English, (B) Group, (C) Military Science and Physical Education requirements as follows:

A. English Composition.
1. A placement examination in English is required of all freshmen.
2. Beginning freshmen are required to take Basic Communication 1 and to continue through Basic Communication 2 and 3. Students who enter with transfer credits should consult with the English Department concerning the Basic Communication course that they may be required to take.

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

GROUP REQUIREMENTS

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

1. Biological Science. This group requirement may be satisfied by taking any one of the following combinations of courses:
   A. Biology 1 and either 5 hours of lower division Bacteriology or Physiology 4.
   B. When more technical courses are required they may be used to satisfy this group requirement if taken in any of the following sequences:
      3. Any two of the following three series:
         a. Bacteriology 10 or 70 and 71.
         b. Botany 24 or 25.
         c. Zoology 2.

   Students who already have a satisfactory knowledge of general biology, as demonstrated by examination, may satisfy this group requirement by taking Bacteriology 10 or 70 and 71 and Physiology 4.

2. Exact Science.
   Chemistry—and course of Lower Division grade.
   Geology—1 or 3, 4, 5.
   Geology 1 or 3, 4; Physical Science 31, 32, 33 (Complete sequence required for credit.)
   Mathematics—any course of Lower Division grade.
   Physics—any course of Lower Division grade.

3. Language and Arts.
   Art 1, 2, 3, 4, 22, 26, 32, 33, 36.
   English—any literature course of Lower Division grade.
   Landscape Architecture 3.
   Language—any beginning course in French, German, Portuguese, Spanish or Latin. (A minimum of 14 credits must be earned in a beginning course in language before credit is applied toward graduation.)
   Music 1, 80, 81, 90.
   Speech—any course of Lower Division grade.

4. Social Science.
   Agricultural Economics 53.
   Economics 51, 52.
   History—any course of Lower Division grade.
Majors in departments in the School of Arts and Sciences should see the introduction to the Arts and Sciences section of this catalog for suggested courses with which to fill group requirements.

C. Physical Education. Six quarters of work in Physical Education activity classes are required of all women students, and also of all men students who do not take the required courses in Military Science or Air Science.

Students in divisions that prescribe the curriculum for a full four-year course (as Forestry, Smith-Hughes teacher training, Engineering, and Technology) are exempt from group requirements listed above. If a student transfers from one of these divisions, he is responsible for fulfilling all of the course requirements of the new division.

UPPER DIVISION

Ninety-six credits (quarter hours of credit) with an average grade of 75% or higher are required for admission to the Upper Division. Graduates of standard normal schools and junior colleges, and students from other colleges who present at least 90 credits of acceptable college work, in addition to the courses in Physical Education or Military Science required at the Institution from which they are transferring, may be registered in the Upper Division.

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. Students who change from a prescribed course to a major under the group elective system must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue on in a prescribed course will be held for the completion of the Lower Division courses as prescribed at this institution, except as equivalent courses may be accepted as substitutes for our own courses.

Major Subjects: The student should select a major subject upon entering, or early the first year, but not later than entrance in the Upper Division. As soon as the major subject has been selected, the student should consult the head of the department in which he has decided to major. The head of the department will thereafter act as the student's adviser. The student's registration in each succeeding quarter should be carefully checked and approved by this adviser (called the major professor) in order to insure proper selection and sequence of courses for satisfying institutional and departmental requirements.

The Major Department has the authority to prescribe not less than 30, and not more than 50 credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). The Major Department and the Dean shall also prescribe such other related courses as may be considered desirable, provided always that the student's 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 College. If they pursue further prescribed work in their field for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this College. They need not comply with general major-minor requirements as previously outlined.

Minor Subjects: The student is permitted to choose his own minor. The minor consists of 18 credits either in one department or in two departments closely related in subject matter, provided that minor in more than one department must have the approval of the Dean and the Major Professor.
Courses used to satisfy the English composition, the basic groups, military science or physical education, and freshmen orientation requirements as specified under the Lower Division cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation

The College offers Certificates of Completion for two years of study in certain departments; the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy; and gives work to fulfill the requirements for all professional certificates issued by the State Board of Public Instruction.

IMPORTANT: The College reserves the right to change at any time the requirements for graduation, and every candidate for a certificate, a diploma, or a degree shall be held to compliance with such changes, as far as the uncompleted part of his course is affected.

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

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

Terminal Certificate

The Schools of Agriculture, Home Economics, and Engineering and Technology offer two-year courses in practical studies leading to a certificate of completion for those who are not interested in the regular four-year course leading to the B.S. degree.

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

To qualify for this Certificate, the student must:
1. Satisfy the entrance requirements.
2. Complete 96 credits, including the required work in Physical Education or Military Science.
3. Complete a Major of 30 credits in one or more closely related departments of the School in which the Certificate is granted.
4. Complete a Minor of 15 credits closely related or basic to the Major subject. This need not be in the same school.
5. Complete 24 credits in the basic groups, as follows: Language, nine, which must include English 10; Exact Science, five; Biological Science, five; and Social Science, five.
6. Complete 21 credits of elective work.

For additional information, see descriptions of work in the school concerned.

In the School of Engineering and Technology, 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 section entitled “School of Engineering and Technology.”

Requirements for the Degree of Bachelor of Science

The College confers the degree of Bachelor of Science in Agriculture; Forest, Range and Wildlife Management; Arts and Sciences; Agricultural Engineering; Civil Engineering; Commerce and Business Administration; Home Economics; Education; Industrial Education, or Technology upon students who meet the requirements specified herewith:
Before a student can become a candidate for a baccalaureate degree, the abstract of his record in College must show: first, that he has satisfied the entrance requirements prescribed for the class with which he expects to be graduated; second, that the collegiate work for which he has credit, his conditional and other pending credits, the completion of which he is reasonably assured, and the work for which he is registered or is planning to register, together satisfy the requirements for graduation including Physical Education and Military Science as prescribed for his class.

Regular students who are planning to graduate at the next Commencement should consult their major professor and jointly prepare the "Admission to Candidacy" form not later than the fourth week of the Fall Quarter. Students are admitted to candidacy when the plan of course work presented is found to fulfill all remaining requirements for graduation.

Summary of Requirements for Graduation

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

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

2. Six quarters of work in Military or Air Science for men unless officially excused from this requirement. Students are normally required to complete the basic military course of six credits during the Freshman and Sophomore years. Men exempt from Military Science are required to substitute one quarter of Physical Education for each quarter of Military Science from which they are exempt. If exempt from both Military Science and Physical Education, candidates must present one credit of other work for each quarter they have been exempt.

The advanced course consists of the third and fourth year of Military Science. Entrance upon the advanced course is elective, but once entered upon, the course becomes a prerequisite for graduation, unless the student shall be discharged in accordance with the provisions of Army Regulation 145-350 or Air Force Regulation 45-48 and AFROTC Manual 46-1.

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

4. Sixty credits of Upper Division work.

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

6. The completion of the group requirements and of nine hours in Basic Communication or its equivalent. For students who entered the College prior to 1955, the completion of English 10 and 110 or of English 17, 18, and 19 will be considered as the equivalent of nine hours in Basic Communication. Does not apply to students who are pursuing a prescribed course of study such as in Forestry, George-Barden Teacher Training, Engineering and Technology.

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

8. Applicants for degrees who have taken courses for credit in the Extension Division are subject to the regular college instruction requirements and must file transcripts of credit with the Registrar's Office.

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

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

Grade points have been assigned to grades as follows: 3 grade points for each credit of "A," 2 for each credit of "B," 1 for each credit of "C," zero for credit of "D." A deduction of one grade point is made for each hour of failure. For graduation, a student must have 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.

11. The candidate must file an "Application for Admission to Candidacy" not later than the fourth week of the Fall Quarter preceding graduation. This application must show the course of study to be followed in order to complete all requirements for graduation and must be approved by: (a) the professor in charge of the major subject; (b) the dean of the school in which the major work is done.

12. The candidate should file an "Application for Graduation" as soon as possible after the first day of the winter quarter. Any candidate who fails to file his application for graduation by the first day of May will be held over to the next year's commencement.

13. The candidate must have discharged all College fees.

14. Attendance at Commencement Exercises is expected of all candidates. Those unable to attend must notify the Graduation Committee in advance.

Requirements for High School Teacher's Certificate

Students graduating with majors in Elementary and Secondary Education must meet the requirements for a Utah State Teacher's Certificate. Majors in other departments may also earn a certificate by meeting the requirements for one of the various certificates granted by the State Department of Public Instruction. For details of the requirements for the various teaching certificates see "School of Education."

GRADUATE SCHOOL

J. STEWART WILLIAMS, DEAN

Organization

Graduate study is supervised by the Dean of the Graduate School, assisted by the Graduate Council. This council consists of one representative from each of the seven schools of the college, and the Libraries. Members of the Council are appointed by the President in December and each year to serve a one-year term commencing the first of July following.

The Graduate Council for 1956-57 is as follows:

School of Agriculture—Professor Leonard H. Pollard
School of Humanities and Sciences—Professor Eldon J. Gardner
School of Business and Social Sciences—Professor Evan B. Murray
School of Education—Professor Arden Frandsen
School of Engineering—Professor M. Greaves
School of Forest, Range and Wildlife Management—Professor Laurence A. Stoddart
School of Home and Family Living—Professor Ethelwyn B. Wile
Libraries—Professor Milton Abrams

Admission to Graduate School

A graduate with a Bachelor's degree from Utah State Agricultural College or from any other accredited college or university may be admitted to the Graduate School. Seniors in this college who have an average of "B" or better in all their courses in the junior and senior years, and who at the beginning
of any quarter lack not more than five quarter credits to complete all require­ments for the Bachelor's degree, may be allowed to register in the Graduate School.

An application for admission accompanied by transcripts of all previously earned credits and letters of recommendation should be presented as far in advance of the day of registration as possible. The applicant must be approved by the department in which he proposes to work.

Students who cannot qualify for the degree program in a particular field may be admitted to the Graduate School as non-candidate students. Admission to the Graduate School does not imply admission to candidacy to a higher degree.

Master's Degree

General: The Master of Science degree is offered in most of the basic biological, physical, and social sciences and in various educational, industrial, and professional divisions of the college. The specific departments in which the Master of Science degree is given, together with the courses provided by the departments, may be determined by consulting the departmental statements provided in this catalogue under the various undergraduate schools of the College.

Qualifying Examinations: A qualifying examination is required by the Graduate School and may be taken prior to registration. If not taken, this examination and any qualifying examination required by the student's 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 a student is 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 Master's 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 the student's program and in con­ducting necessary additional qualifying examinations and the final examination. When the student's program has been determined and approved by his committee, he will be advanced to candidacy for a degree. Advancement to candi­dacy must be accomplished before the end of the winter quarter if the student is to graduate at the following Commencement. When the student's 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.

Student Program: The student program for the Master of Science degree must include:

1. At least 15 credits taken on the Logan campus;
2. At least 45 credits in courses numbered 100 or above which are approved for graduate credit;
3. At least 10 credits, exclusive of thesis, in courses numbered 200 or above;
4. A thesis with 9 to 15 credits, or thesis alternate as described below.

Thesis: Each candidate for a Master of Science degree, usually must pre­sent a thesis on a topic within the field of his major subject which must repre­sent from 9 to 15 hours of the credit presented for his degree. The thesis must be a contribution to the field of knowledge, based on 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 stu­dent's advisory and examining committee at least two weeks before the date of his final examination. After approval by the committee and the depart­ment, and after the student has successfully passed the final examination, four
copies of the final draft of the thesis must be deposited in the graduate office. Two of these copies will be deposited in the library, another sent to the department, and the fourth returned to the student.

Thesis Alternate: The supervisory committee may permit the substitution of three advanced reports, valued at 6 to 10 credits, for the regular thesis. These are known as “Plan B” reports. The Master's program is otherwise the same under “Plan B.”

For students working under “Plan B” in general agriculture, the Dean of the School of Agriculture will select a major professor to be the chairman of the supervisory committee. The student’s program must include a minimum of 6 credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

Final Examination: Each candidate for a Master of Science degree is required to pass a comprehensive final examination on the subjects of his graduate study and on his thesis. This examination may be oral or written or both as his committee may decide, and is open to all faculty members and officials of the Graduate School. Arrangements for the time and place of the examination are made by the Dean of the Graduate School. A member of the advisory and examining committee, other than the major professor, or a representative of the Graduate Council is appointed to act as chairman of the examination and submits to the Graduate Council the results of the examination. For candidates who are to receive their degree at the June Commencement, the date of the final examination should be not later than May 10.

Time Limit: Work for a Master of Science degree must be completed within six years from the date of matriculation as a regular student in the Graduate School 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 or off-campus credit to be allowed will be determined in consideration of the student's entire course program. In no case will more than nine quarter hours of extension credit be allowed as counting toward a degree, and the total of off-campus credit may not exceed 15 hours, exclusive of thesis. All extension courses for which graduate credit is sought must be regularly registered for through the Graduate School, and must have the sanction of the head of the department in which the student is doing his graduate work. Credit toward a Master of Science degree is not granted for correspondence study.

Transfer Credit: A maximum of 9 quarter credits of graduate work satisfactorily completed at another approved Graduate School may be allowed toward a Master of Science degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the student's committee.

Credit Load: Maximum load for full-time graduate students is 16 credits. Maximum for assistants engaged in teaching or research is 12 credits.

Degree of Civil Engineer and Irrigation Engineer

The School of Engineering and Technology offers a two-year graduate program in Civil Engineering and Irrigation Engineering leading to the degrees of Civil Engineer and Irrigation Engineer. The plan of study for those degrees is similar in many respects to plans at other western institutions for degrees of Civil Engineer, Mechanical Engineer, etc.

Special Requirements: The student program for these degrees include:

1. A minimum of 6 quarters of study, of which at least 3 quarters must be in residence at Utah State Agricultural College.
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 3 quarters in residence.
2. Completion of a suitable program of study of not less than 45 credits, of which
   (a) at least 30 credits must be graduate courses (200 series), and which
   (b) a maximum of 20 credits for thesis.

The suggested curriculum for these degrees is detailed in the section on engineering.

Degree of Doctor of Philosophy

General: The degree of Doctor of Philosophy (Ph.D.) is awarded by the Utah State Agricultural College in recognition of high attainment and productive scholarship in a special field of learning.

Admission to the Graduate School to work toward the degree of Doctor of Philosophy is obtained in the same manner as for the Master's degree. Qualifying examinations are similarly required, and the student's program is likewise directed by a supervisory committee.

Student Program: The student program for the Doctor of Philosophy degree must include:

1. Three years of full-time graduate study above the Bachelor's degree. If the student has a Master's degree, then two years will be required. The student's supervisory committee may recommend that part of this program be taken at other schools, but the last year must be spent in residence at Utah State Agricultural College;
2. A minimum of 135 credits of approved graduate study beyond the Bachelor's degree, 90 credits beyond the Master's degree;
3. A major field to which approximately two-thirds of the time is devoted. The minor may be divided between two suitably related areas. A Master's degree in a suitably related area may satisfy the minor requirement.
4. A research problem on which a thesis will be presented. Credits for this thesis may not exceed 45, and work on the thesis should ordinarily occupy most of the third year, but may be carried on with course work throughout the program.

Language Requirement: A reading knowledge of at least one foreign language is required of all candidates. The particular language required will be that which meets best the applicant's needs. Requirement of a second language will be optional with the department in which the student is taking his major. The degree of proficiency of the applicant to use the required language in his chosen field and his knowledge of the grammar and structure of the language will be determined by a committee appointed by the Dean of the Graduate School from members of the language department.

The language examination should be taken before the beginning of the third year of study.

Comprehensive Examination and Candidacy: Written and oral examinations are conducted by the supervisory committee and the departments concerned, usually in the last quarter of the second year of the student's work, to determine his fitness for admission to candidacy for the degree of Doctor of Philosophy.

Thesis: A completed dissertation approved by the department must be presented to the supervisory committee not later than May 1 of the year in which the student will graduate. The dissertation must show ability to do critical and independent research. It must present a contribution to knowledge in scholarly fashion.

Final Examination: The final examination in defense of the candidate's thesis will be conducted by the supervisory committee not later than two weeks before the date of commencement.
Teaching and Research Assistantships

A number of teaching and research assistantships in various departments of the college are available each year to graduate students. Teaching assistantships carry a stipend of $850 for one-third teaching service on a nine-month basis. Remuneration for research assistantships may vary from $850 to $1,500 dependent upon the time of service involved. Generally assistantships are arranged so as to allow the student to complete work for his Master's degree in two years. At present, assistantships are available in the following departments: Animal Husbandry, Accounting and Business Administration, Agricultural Economics and Marketing, Agronomy, Art, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Child Development and Parental Education, Civil Engineering, Dairy Industry, Economics, Education, English, Entomology, Forest Management, Foods and Nutrition, Geology, Horticulture, History, Irrigation and Drainage, Instrumental Music, Mathematics, Modern Languages, Physiology, Physics, Physical Education, Psychology, Range Management, Sociology, Speech, Vegetable Crops, Veterinary Science, Wildlife Management, and Zoology. Research fellowships are available in: Animal Husbandry, Agricultural Economics and Marketing, Agronomy, Chemistry, Entomology, Irrigation and Drainage, Physiology, Range Management, Wildlife Management, and Zoology.

Graduate Programs in Education

The following degrees are offered in the field of Education:

**Master of Science.** The Master of Science degree is awarded to those students completing a full year of graduate work in specified courses and writing a research thesis for which 9 to 15 credits is allowed. "A minor of 10-20 hours is required. In the case of secondary and vocational education, this minor should be made up of advanced courses in the area of the student's teaching major or minor." The thesis requirement may be fulfilled by the writing of two field studies.

**Master of Education.** The Master of Education degree is granted in each of the following areas:
- Master of Education in School Administration and Supervision
- Master of Education in Secondary Education
- Master of Education in Elementary Education
- Master of Education in Vocational 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 aims at providing 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 designed to meet the specific needs of the individual student. This professional degree emphasizes proficiency in the interpretation and application of research.

**Doctor of Education.** The professional 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 a high degree 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 supplementary field other than professional education.

Essentially the requirements for the Doctor of Education degree are the same as those for the Ph.D. except that not more than 25 credits may be granted for the thesis. Thus more course work is required, and there is no foreign language requirement.

Detailed requirements for the above degrees may be obtained at the office of either the Dean of the Graduate School or the Dean of the School of Education.

**Graduation**

Requirements for graduation in the various schools and departments of the College are listed in the general catalog. In most cases students can com-
plete many of these requirements by attendance during summer quarter. In
every department, one or more advisers are assigned to guide the student's
work leading toward graduation. Students planning to attend during the
summer are invited to write to the departments in which they are interested
for evaluation of credits and other such guidance services.

Student Fees

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

Resident Students

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Special Fees

LATE REGISTRATION FEE: $5.00 beginning second day after specified
Registration Days; additional $1.00 for each additional day up to a maximum
of $10.00.

Change in Course or Study List: No charge for the first week of the
Quarter. $1.00 for each change made thereafter.

Final Deadline for Course Changes: Course changes, adds or drops, may
be made through the third week of the Quarter. Thereafter, through the
seventh week only, courses may be dropped from but not added to the study
list (academic program).

Special Students—Registration fee $10.00

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

Qualifying Examination—Graduate School

1 part $5.00
2 parts $6.00

Graduation Fee $10.00

Social Work Certificate $5.00

Teacher Placement Fee $2.00

Teacher Placement re-registration $1.00
Locker Rental—Fall, Winter and Spring ........................................ 1.50

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

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

Additional transcripts .................................................... 25 to .50

Progress Report. Adviser furnished one copy free.

Additional copies .......................................................... 25 to .50

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

Cap and Gown Rental—Bachelor of Science ......................... 3.00

Master of Science ...................................................... 6.50

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

School of Forest, Range, and Wildlife Management—

Senior Field problems:
Forestry 146 ......................................................... 35.00
Range Management 196 .............................................. 30.00
Wildlife Management 171 ........................................... 35.00

Excess breakage or loss as determined by departments must be paid at cashier's office before credit will be released.

Military Uniform Deposit ............................................... 5.00

The above deposit is refundable upon presentation of clearance slip from department—accompanied by receipt showing that payment was made.

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

Music—Individual Instruction with members of the College staff:
One lesson per week (10 lessons) per Quarter (1 ½ credits) $25.00
Two lessons per week (20 lessons) per Quarter (3 credits) 50.00

Individual instruction with additional authorized teachers (as listed on page 154) 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 12 and 112 is $20.00 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

Hansen, Burrell MYERS, Chester J. Thornley, Gwendella
Morgan, Floyd T. Newman, Parley Robinson, Rex E.

Refunds—All fees paid, with the exception of the $10.00 registration fee, may be refunded to any student in residence who withdraws from school before the end of the 7th week, in proportion that the number of instructional weeks subsequent to withdrawal bears to the number of instructional weeks in the period covered by the fees paid.

According to the constitution of the Associated Students, every regular 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., and, in addition, give him a copy of the annual yearbook and a subscription to the College paper. The system has been found to be a great saving to the students and a most excellent means of fostering proper interest in student activities.
Since all women students are required to take Physical Education, they must provide themselves with gymnasium suits and gymnasium shoes. The cost is about $6.00.

Each student in Foods and Dietetics, Home Nursing and Household Administration 150, must provide herself with two washable white uniforms.

The fee for Household Administration 150, required for all Home Economics majors, is $1.00 per day for the one-half quarter residence in the Home Management House. This fee is to be paid when entering the residence.

STUDENT PERSONNEL SERVICES

Ellvert H. Himes
Dean of Students

Mae Welling
Dean of Women

Dean Hurd
Chairman, Student Employment

Asa L. Beecher
Registration and Records

George A. Meyer
Foreign Student Adviser

H. B. Hunsaker
Chairman, Student Health Services

W. W. Skidmore
Coordinator, Housing

Vernon L. Isaaksen
Chairman, Student Loans

C. Jay Skidmore
Marriage Counseling Services

Evan B. Murray
Chairman, Scholarships, Awards

Evelyn Hodges Lewis
Orientation Activities

Thelma B. Waddoups
Admissions Counselor

The student personnel program consists of the directed activities of a group of competent professional services designed to assist individual students in adjusting to college life. These services are so organized and coordinated with the academic offerings as to become an integral part of the broad educational program of the institution. The principal services provided include high school cooperation, broad orientation procedures, admissions, registration, and records, personalized counseling, coordinated student organizational activity, student health services, supervision of campus and off-campus housing arrangements, financial aids in the form of scholarships, awards, grants-in-aid and loans; student employment for part time, full-time and post-graduate needs; special assistance to students from abroad; opportunities for meeting religious needs and development.

The administration and coordination of the entire program of student personnel services is the responsibility of the Dean of Students. He is assisted by the Dean of Women who serves as counselor and adviser to women and administrator of several personnel areas. Each of the various services is under the direction of student personnel specialists and qualified faculty members who have been carefully selected to consider each student in regards to his or her particular needs.

In addition, the Deans and chairmen of each of the services receive valuable advisory assistance from well organized committees consisting of representatives of administration, faculty and students. Thus, unusual attention is given to the welfare of every student, his needs, potentialities, and self-realization.

The Student Personnel Office, Main Building, Room 133, invites inquiry from students on campus and prospective students and others off campus who wish to obtain information concerning student personnel services.
STUDENT ACTIVITIES

Students may participate in the following activities:

1. Intercollegiate athletics.
2. Intramurals. This program includes all seasonal sports, for which awards are given.
3. Musicals. Performances are given by band, orchestra, choral groups, and music clubs. These organizations present several concerts during the year, and each group tours some part of the surrounding area.
4. Theatricals. Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.
5. Opera. Each year the Music Department produces an opera. Such operas as "Rigoletto," "Faust," "Aida," and "Il Trovatore," have been presented.
6. Debating and Public Speaking. The College is a member of the Rocky Mountain Forensic League, and each fall 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.
7. Student Publications. Students publish a weekly paper, "Student Life"; a yearbook, "The Buzzer"; and a quarterly magazine, "Scribble"; "Blue Book" and Student Directory, which are distributed to all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's "Juniper."
8. KVSC. The College FM radio station operates as the "Voice of the State College." Four hours of radio programs daily are prepared and broadcast by students. KVSC is a member of the National Association of Educational Broadcasters.
10. Dances and Entertainments. In addition to the above, the Student Body Organizations furnish extensive entertainment in the form of dancing, parties, and athletic events.
11. Assemblies. These are planned and produced by students to provide entertaining, spiritual and cultural programs.
12. Committees. Students are members of virtually every college committee. This includes not only Student Body committees, but also committees set up by the administration.

STUDENT GOVERNMENT

Associated Students. All students, upon payment of student body fees, become members and are therefore entitled to participate in and attend all activities sponsored by the association, such as athletic events, musicals, dramas and dances.

The Executive Council consists of the five elected major officers of Associated Students; viz., student body president, first and second vice-presidents, secretary, and business manager. The Council is responsible for the supervision of 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 include: the Executive Council, the president of each of the four classes, a representative of each of the seven schools, A. W. S. president, A. M. S. president, two representatives of independent students, and an international representative chosen by the foreign students on campus. There are three ex-officio members: president of Panhellenic, president of Inter-fraternity Council, and editor of Student Life.
Associated Men and Women Students. Every man and woman student properly registered and enrolled in the College is a member of A.M.S. or A.W.S. These organizations foster greater interest and participation in campus activities. They are governed by their own elected officers and board.


STUDENT ORGANIZATIONS

Departmental and Professional

Agriculture. Ag Club, Ag Economics Club, Agronomy Club, Alpha Tau Alpha, Alpha Zeta, Block and Bridle Club, Dairy Club, Horticulture Club, Poultry Club, Sears Roebuck Scholarship Club, 4-H Club.

Business. Alpha Kappa Psi.

Chemistry. American Chemical Society.

Education. Association for Childhood Education International, Phi Delta Kappa.


Forestry. Foresters' Club, Forestry Wives, Xi Sigma Pi.

Geology. Geology Club.

History. History Club, Phi Alpha Theta.

Home Economics. Home Economics Club, Phi Upsilon Omicron.

Landscape Architecture. Landscape Architecture Club.


Music. Alpha Eta Mu, Band, Chansonettes, Meistersingers, Orchestra.

Physical Education. Dance Club, Modern Dance Group, P E M M Club (P.E. majors and minors) Ski Club, Square Dance Club, Women's Intramural Association.

Political Science. International Relations Club, Pi Sigma Alpha.

Pre-Med. Alpha Epsilon Delta.

Psychology. Psychology Club.

Sociology. Sociology Club.

Speech. Tau Kappa Alpha, Theta Alpha Phi.

Zoology. Utazoa Club.

Social and Special Interest

Fraternities, Social. Kappa Sigma, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi.

Sororities, Social. Alpha Chi Omega, Chi Omega, Kappa Delta, Sigma Kappa, Theta Upsilon.

Recognition and Honorary. Alpha Sigma Nu, Alpha Lambda Delta.

Regional. Bear Lake Club, Canadian Club, Weber Club, Sudag, California.


Scholarship. Phi Kappa Phi, Sigma Xi.

Service. Blue Key, Intercollegiate Knights, Spurs, Sponsors.

AWARDS AND HONORS
(Presented principally to students already enrolled)

Students who are interested in applying for scholarships and other awards should contact the Dean of Students Office, Room 133, Main Building, on or before March 1, unless otherwise specified.

The Johansen Scholarship Fund of $5,000, a gift of the late Mrs. Johanna Johansen, provides scholarships annually, worth in the aggregate from $125 to $150, for help of worthy students of Junior and Senior rank.

The Lieutenant Clyde Parker Baugh Memorial Fund of $10,000, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership.

KSL Meritorius Scholarships. KSL awards two scholarships, one in technical radio work and one in script writing or broadcasting.

The 1927 Class Gift to the College yields an annual income sufficient to provide two scholarships of $125 each. Application should be made by Juniors and must be accompanied by an approved outline of a proposed study project to be completed during the senior year. Two copies of the complete thesis are to be filed in the College library.

Rhodes Scholarships. Candidates for Rhodes Scholarships at Oxford University, England, are selected each year from Utah. High scholarship and some definite quality of distinction, whether in intellect, character, or personality, or in any combination of these, are the most important requirements. The present value of the scholarships is £500. Seniors or graduate students are generally chosen as candidates. It is suggested, however, that students would do well to begin preparing for the candidacy in earlier years. Information and application blanks may be obtained from Dr. Sherwin Maeser, college representative, Rhodes Scholarship Committee.

The Danforth Summer Fellowship is awarded jointly by the Danforth Foundation and Ralston Purina Mills to an outstanding Junior in the School of Agriculture. The award covers expenses for two weeks in St. Louis and vicinity, and two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. Forty students from as many colleges are awarded this fellowship. Additional information and application blanks may be obtained from the Dean's office.

The Rollo M. Rich Memorial Scholarship is awarded annually to an outstanding student in the Upper Division who is a major in the School of Agriculture and has filled a mission for the L. D. S. Church or has otherwise participated in activities of the L. D. S. Church.

First Security Foundation. Two scholarships of $500 each awarded to students of business and finance at the end of their sophomore year.

Joseph E. Greaves Memorial Scholarship. An award of $100 given each year by Dr. Ethelyn O. Greaves in memory of Dr. Joseph E. Greaves to a student who gives evidence of superior performance in some field of basic science and is in need of financial assistance.

Louisa Y. Robinson National Woman's Relief Society Scholarship. A gift of $5,000 from the General Board of the National Woman's Relief Society has established a perpetual fund, the annual earnings from which are available for Latter-day Saint women majoring in Social Work, or, as graduate students, majoring in Sociology with a special interest in the family or some field closely related to Social Work. The scholarship is in the amount of $100 for undergraduate students and $200 for graduate students. Undergraduate preference is given to Seniors, although Juniors are eligible, and are encouraged to apply. The scholarship is paid in full when the student completes her registration for the fall quarter. Applications 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.
Borden Agricultural Scholarship Award of $300 is given to the student who in all college work preceding his senior year has achieved the highest average grade among students in agriculture completing two or more dairy subjects.

The Burpee Award in Horticulture is an annual award of $100 made possible through a grant from the W. Atlee Burpee Company, seed growers, Philadelphia, Pa., and Clinton, Iowa. It is made on the basis of scholarship, practical experience, and interest in flower and vegetable seed growing.

The W. Atlee Burpee Award in Floriculture is an annual award of $100, made possible through a grant from the W. Atlee Burpee Company, seed growers, Philadelphia, Pennsylvania, and Clinton, Iowa. It is made on the basis of scholarship, practical experience and interest in floriculture.

Alpha Zeta Award is made annually by Alpha Zeta fraternity honor society of agriculture and forestry students, to the sophomore in Agriculture or Forestry who made the highest scholastic record in his freshman year. The name of the winner is engraved upon a permanent trophy.

U. S. A. C. Horticultural Club Scholarship in General Horticulture. An annual award of $25 to a sophomore student; based on scholarship and interest in horticulture demonstrated during the freshman year.

U. S. A. C. Horticultural Club Scholarship in General Floriculture. An award of $25 to a sophomore student; based on scholarship and interest in floriculture demonstrated during the freshman year.

U. S. A. C. Horticultural Club Scholarship in Pomology. An award of $100 made at the beginning of the senior year to a student majoring or minor ing in pomology. The award is based on demonstrated interest in pomology, participation in school activities, and scholastic ability.

Home Economics Scholarship Award. An award of $100 given in 1952 to an outstanding high school graduate who plans to enter college and to receive a degree in some phase of Home Economics. The recipient will receive $50 at the beginning of Fall quarter and $25 at the beginning of Winter and Spring quarters. Award is based on scholarship, citizenship, and need.

Swift and Company Essay Contest. Each year Swift and Company conducts an essay contest. The winner is awarded a trip to the International Livestock show, Chicago, where he spends approximately a week studying meat packing. All essays must be submitted to the Dean, School of Agriculture on or before November 1.

The Leadership Challenge Cup is awarded each year to a Senior student in Agriculture who has exhibited the greatest measure of constructive organization and leadership in the School of Agriculture through his College course.

The American Rambouillet Sheep Breeders' Association Challenge Cup was donated to the Animal Husbandry Department by the American Rambouillet Sheep Breeders' Association, to be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

The Ogden Union Stock Yards Challenge Cup, a gift of the Union Stock Yards Company, Ogden, is awarded each year to the student who shows the most proficiency in judging beef cattle.

The Hawaiian Steamship Company's Challenge Cup, a gift of the Hawaiian Steamship Company, is to be awarded each year to the student who shows the most proficiency in judging wool.

The Salt Lake Union Stock Yards Company Challenge Cup, a gift of the Union Stockyards Company, Salt Lake City, is awarded each year to the student who shows the greatest proficiency in judging hogs.

The John K. Madsen Challenge Cup, a gift of John K. Madsen, Mt. Pleasant, Utah, is awarded each year to the student who shows the most proficiency in judging sheep.

The Phi Upsilon Omicron Scholarship of $25 is given annually by the Kappa Chapter of that organization to the Freshman girl in the School of Home Economics ranking highest on the following points: (a) scholarship; (b) participation in student activities; (c) service and cooperation; (d) leadership; (e) moral character; (f) judgment and reliability. The candidate must be a member of the Home Economics Club.
Danforth Foundation Home Economics Fellowships. The first is awarded jointly by the Danforth Foundation and the Ralston Purina Company to an outstanding junior in the School of Home Economics. The award provides for two weeks' study of business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan.

The second is awarded by the Danforth Foundation to an outstanding freshman in home economics. The award provides two weeks' leadership training at the American Youth Foundation Camp.

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 two or better.

Chi Omega Fraternity Scholarship of $25 is awarded annually to the girl majoring or minoring in Social Sciences who gives evidence of superior scholarship and ability to make a contribution to organized group life. The Committee of Awards is appointed by Chi Omega Fraternity each year from the teaching staffs of the Sociology and Economics Departments.

Associated General Contractors Scholarship Award. A gift of the Intermountain Chapter, A. G. C., provides a scholarship grant of $200 to a Junior Engineer student. The award is made on the basis of scholarship, promise as an engineer, and need. Selection is made by a committee representing the A. G. C. and the Civil Engineering Department. Applications for the succeeding year must be filed with the Dean on or before April 1.

A. S. C. E. Membership Award. Junior Membership in the American Society of Civil Engineers, is awarded by the Intermountain Section, A. S. C. E., to a graduating senior in Civil Engineering on basis of scholarship, activities, and personality. Selection is made by the Intermountain Section upon recommendation by the Engineering Faculty.

Eric W. Ryberg Scholarship. A grant of $200 from the Utah Sand and Gravel Company is made to a student in Civil Engineering selected by a special committee. Application should be made to the Dean of the School of Engineering by December 1.

The Eric W. Ryberg Memorial Scholarship in Commerce, sponsored by Eric C. and Maridean M. Ryberg, is awarded annually to a Junior, Senior, or graduate student in the School of Commerce (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.

Engineering Faculty Award. Junior Membership in the A. S. C. E. or A. S. A. E. awarded by the Engineering Faculty to a graduating senior in Engineering on basis of scholarship, and promise of success in engineering. Selection is made by the Engineering Faculty.

Sigma Tau Award. To the outstanding Sophomore Engineering student for scholarship, sociability and practicability. Selection made by the Alpha Delta Chapter of Sigma Tau, an honorary engineering fraternity.

A. S. C. E. Student Chapter Award. Junior membership in A. S. C. E. to the senior doing most for the chapter. Selected by vote of members.

The American Society of Tool Engineers Awards. Two $100 scholarships are awarded to engineering students who show interest, ability and scholarship in pursuing tool engineering curriculum. Donors are Eimco, and McGhee & Hogan Machine Works, Salt Lake City. Application should be made to the Salt Lake City Chapter 85 or the Tool Engineering Department, U. S. A. C., not later than February 10 each year.

Deseret News Professional Internship. The News offers the outstanding junior student in journalism a scholarship including one year's tuition at the College 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 U. S. A. C. 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 in college.

Cache Valley Chapter of the Utah State Historical Society Award. The Cache Valley Historical Society offers annually an award of $25 to the U. S. A. C. 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.

Colonel Joe E. Whitesides Award is given to the outstanding student-athlete selected by the Athletic Council on the basis of (1) academic achievement, (2) athletic achievement, (3) army (R. O. T. C.) achievement, (4) adjustment to meet the daily demands in character, social and general culture.

The American Legion Military Medal, a gift of the Logan American Legion Post, is awarded each year to the letterman who maintains the highest scholastic record during the year, and who exhibits the most wholesome attitude towards Military training.

The R. O. T. C. Medal, a gift of the institution, is awarded each year to the student in Military Science and Tactics who most nearly represents the ideal that the Reserve Officers' Training Corps is striving to develop, upon the following basis: (a) Character, 20 points; (b) Scholarship, 15 points; (c) College activity, 15 points; (d) Leadership, 20 points; (e) Aptitude for and interest in Military Science, 20 points; (f) Physique and bearing, 10 points.

The Utah State Agricultural College Science Medal, a gift of Director Emeritus William Petersen, is given each year to the student writing the best review of recent scientific research in either mathematics, physics, chemistry, geology, zoology, botany or astronomy.

Scholarship A's in the form of gold pins are given to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholastic Award.

Alpha Kappa Psi Scholarship Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at the Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior in Commerce with the highest scholastic average for four years of study in this College.

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.

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.

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 college activities, scholarship, service to the College, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

Faculty Women's League Scholarship Award is awarded to Senior women and is based on scholastic records for full undergraduate work. To be eligible for this award, candidates must have spent at least two years at this institution.
Faculty Women's League Democracy Award is awarded to Senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to college life, as exemplified by the following considerations: (1) Awareness of issues vital to college life, (2) individual responsibility for their solution, and (3) accommodation of individual interests to what seems to be the common good.

The College Award is conferred annually upon the male student of the institution who shows evidence of being able, in greatest measure, to repay the nation the investment which it has made in him, on the following basis:

(a) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, natural ability and talent (50 points); and

(b) His patriotism, honesty, and good judgment as a student citizen, as an indication of his future attitude as a voter or public servant, combining a progressive spirit with a love of country and a concern for the safety and development of American institutions of liberty and justice and his qualities of social leadership as shown in student affairs, based upon physical and moral cleanliness and strength of character (50 points).

A College Award is also conferred annually upon the woman student of the Institution who shows evidence of 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).

COUNSELING SERVICES

A broad program of counseling services has been designed to meet the various levels of student needs. This program is coordinated in the Dean of Student's Office under the supervision of the Coordinator of Counseling Services, who is also a professional counselor. Skilled counselors and advisers from the departments of Psychology, Sociology, Social Work, Speech, and the various academic schools are a part of this service. Much of the success and effectiveness of the program is attributable to the excellent cooperation and collaboration of the Academic Deans, their school counselors and other members of the various schools.

In addition to the professional staff, qualified graduate students from the above mentioned departments and students in special training programs help to strengthen and enlarge the services. Carefully selected senior and graduate students are provided to serve as counselors in residence halls, fraternity and sorority houses. These persons keep in close touch with key information that will aid in-residence students in matters of direction, campus, orientation, time management, study habits, regulations and requirements.

Each student has a faculty adviser and will meet and have an opportunity to talk with his academic Dean. Those in residence halls are invited to seek out the counselors provided there. In addition, students who wish the services of special counselors are invited to apply for such services through the Office of the Coordinator of Counseling Services. Special counseling is provided in relation to speech and study habits, personal and social problems, emotional conflicts, courtship and marriage adjustments. A close relationship to community and state agencies is maintained and students needing services not supplied by the college will be referred to or be helped in securing such services. In-service training activities are conducted with a view to keeping this large corps of counselors and advisers alerted to student needs. The Coordinator also conducts research activities through testing and accumulated data that can be useful to academic areas as well as administration.

All of these services are without cost to properly enrolled students.

STUDENT EMPLOYMENT

The Office of Student Employment Services (Main 133) has been established to assist those students who are capable of carrying an academic load.
and need to supplement their regular income through part-time employment. 
Students' wives are assisted also in obtaining positions.
All students and students' wives desiring campus employment must reg-
ister with this office and be appropriately cleared before being hired.
To extend off-campus services, the College has established a cooperative
arrangement with the downtown office of the Logan Branch of the Utah
State Employment Service. Requests for information on employment should
be addressed to Chairman of Student Employment.

FOREIGN STUDENTS

Students from foreign lands are provided a friendly and sympathetic
counselor in the person of Dr. George A. Meyer, Foreign Student Adviser,
Room 124, Main Building. He advises with all students from abroad concerning
problems of adjustment to college life and refers them to the appropriate
agencies and individuals on campus and elsewhere for further assistance.
Foreign students will obtain additional help from the Registrar's Office in
matters of acceptance and admissions, registration, withdrawals, reports to
the Immigration Service and "extensions of stay" in the United States.
All students from abroad are invited to participate in activities sponsored
by the Cosmopolitan Club. This organization has a membership of students
and townspeople from America and foreign lands and promotes numerous
activities fostering international friendships.

STUDENT HEALTH SERVICE

Regulations and requirements:
1. Physical examinations are required of all new students and of all who
participate in athletic and physical education activities.
2. Students are encouraged to have their family doctor give the examina-
tion and report on a form provided by the Health Service. If this is not possible
the Health Service will give the examination without cost.
3. It is highly recommended that students purchase the Student Accident
Insurance available to them.
4. A speech and hearing examination is required of all new students upon
entering the College. Arrangements should be made in the Speech Clinic,
M377.
5. Office Hours:
   8 a.m. to 5 p.m. daily.
   10 a.m. to 12 noon Saturday.
The following medical service is available to all registered students with-
out cost:
I. Regular dispensary care.
   1. Consultation on health matters.
   2. Medical Examinations.
      a. entrance
      b. recheck for follow-up
   3. Care for emergencies such as: fractures, sprains, bruises, dislocations,
cuts, sutures, and all ordinary health matters requiring medical and
minor surgical attention.
   4. X-rays for injuries—fractures, etc.
   5. Consultation for all different cases when needed.
   6. Inoculations and immunizations.
Note: This includes all the care regularly given in any Doctor's office
or clinic.
II. These services are intended to cover the resident student while on the
campus between the hours of 8 a.m. and 5 p.m., and students off the
campus in a school supervised activity.
III. Does not include:
   1. Emergencies occurring off the Campus.
   2. Emergencies occurring out of town.
   3. Chronic illness originating before entrance to school.
   4. Hospital care for any condition.
   5. Major surgery.
   6. Service to wives or children of students.

IV. House calls will be made during Doctor's office hours if reported to the Medical Office. House calls or emergencies called in after Doctor's office hours will be charged at the rate of $2 per call.

V. No medical bills or charges will be paid by the Health Service unless the service has been approved by the U. S. A. C. Medical Office.

VI. In case of illness or an emergency, call:
   1. U. S. A. C. Student Health Services, Telephone 100.

STUDENT HOUSING
(Costs subject to revision)

Supervised Living Accommodations for Single Women

All freshmen women not living at home are required to live in college supervised housing, or other housing approved by the Dean of Women.

Three New Apartment Living Residence Halls will accommodate 210 women, 6 to an apartment. Accommodations consist of combination living-room-kitchen, bath, and 3 bedrooms. Living room-kitchen is equipped with electric refrigerator, electric range, table, chairs, and draperies. Electricity beyond an allowable maximum, cooking utensils, dishes, towels, linens, and all other personal effects are to be furnished by the renters. Rent is $70.00 per person per quarter. Living rooms, recreation and sewing rooms, sundecks, and laundry rooms are shared. Adequate storage space is provided.

Lund Hall is a fire-proof, air-conditioned residence hall for 200 women. Linen changes, bedding, and desk lamps are furnished. Towels and other personal effects are not furnished. An average cost of $189.00 per quarter covers board and room charges. Twenty meals per week are provided.

Co-operative House on campus provides for excellent group living experience for 10 upper-class students who share living expenses and housework. An average cost for rent including heat and water is $42.00 per person per quarter. Other utilities are not provided.

College Apartments, (Prefabracted Units) 28 in number, located in the east section of the Campus, are combination living room-kitchen-study arrangements with bedroom, bathroom and clothes closets. Single apartments accommodate two to three persons and are equipped with electric refrigerators, rangettes, bedding, laundry facilities, and central hot air heating. Electricity, cooking utensils, dishes, window curtains, towels and personal effects are not furnished. Double apartments consist of two single apartments connected with a doorway and accommodate four to six persons comfortably. Rent averages $43.00 per person per quarter, or a minimum of $86.00 per apartment per quarter.

Sorority Houses provide board and room for their members and are managed by their own officers. Each has a mature housemother in a supervisory capacity approved by the Office of Student Personnel. Rates are determined by the house manager and compare favorably with other living rates on campus.

Supervised Living Accommodations for Single Men

Kerr Hall, located at 250 West Center, has facilities for 45 men. A local bus line gives direct service to the Campus. All items except towels and personal effects are furnished. Two meals per day, except one on Sunday, are provided. Average board and room rate is $148.00 per quarter.

College Apartments. Comparable in number, size, type, facilities and price to those provided for single women.
College Apartments (Quonsets) 20 units are available as batching quarters. Each accommodates 2-3 fellows comfortably. Located three blocks from the campus proper, each consists of a kitchen-living room-studyroom arrangement, bedroom, and bathroom. Electricity, fuel, cooking utensils, dishes, window curtains, towels, bedding and personal effects are not furnished. A coal range provides space, cooking, and water heating. An ice box provides refrigeration. The average cost per person per quarter is $25.00. A centralized laundry room is provided.

Fraternity Houses provide board and room for their members and are managed by their own officers. Rates are determined by the house management and compare favorably with other living rates on campus.

Living Accommodations for Married Students

College Apartments, (Prefabricated Units) 248 in number, located on the east fringe of the campus are within easy walking distance of the Campus proper. They are combination livingroom-kitchen-study arrangements with bedroom, bathroom and clothes closets. These units can be rented furnished, unfurnished, or partly furnished with rent ranging from $25.00 to $30 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 an electric range for cooking. A central laundry room is available to each set of 28 apartments.

College Apartments (Quonsets), approximately 40 units, are located two blocks east of the Campus. Each consists of a combination kitchen-living room, study arrangements, bedroom and bathroom. Rent rates run from $16 per month unfurnished to $19 per month furnished. A few double units rent for $25 per month unfurnished, or $28 per month furnished. A coal range provides space, cooking, and water heating. Tenants provide their own electricity, fuel, cooking utensils, dishes, towels, window curtains, bedding, washing machines, and personal effects. A centralized laundry room is provided.

College Trailer Court, located on the corner of 12th East and 7th North, three blocks east of the campus proper, provide 22 modern trailer connections to sewer and water mains. Parking space is hard surfaced. A utility house provides laundry space, also rest rooms and individual shower stalls. Washing machines are not furnished. Monthly space rental per trailer house is $10.

Off-Campus Housing

The College Housing Office maintains lists of accommodations for students in private homes. Many apartments, rooms, board and room, and batching quarters are available. In each instance the final arrangements must be made with the landlord. Rates are determined by the accommodations offered and run from $50 to $60 for board and room, $15 to $25 for a single room, and $30 to $60 for apartments.

Application for Housing

Prospective students are invited to direct their applications and inquiries to Coordinator of Student Housing, Utah State Agricultural College, Logan, Utah. When application is made for College Housing, a security deposit is required in the amount of $5 for single student's accommodations, $10 for family units, and $10.00 for trailer space reservations. Students desiring off-campus housing may procure the current housing list upon arrival at the College, Room 133, Main Building.

Food Services

Food service is obtainable in the College Cafeteria located in the New Student Union Building on campus. Mondays through Fridays schedules and approximate costs run, Breakfast 7:30-8:15 a.m., 35c-40c; Lunch, 11:30 a.m.-1:00 p.m., 50c-75c; Dinner 5:30 p.m.-6:30 p.m., 50c-75c. Saturdays and Sun-
days, Breakfast 9:00-9:30 a.m., Lunch 12:00 m.-1:00 p.m. The snack bar operates 8:00 a.m.-10:00 p.m., Mondays through Fridays and 12:00 m.-11:30 p.m. Saturdays.

Regulations and Procedures

Students are obligated to retain their housing accommodations for at least one quarter, whether in College owned or privately owned housing. If a change of residence is absolutely necessary, students must secure permission from the Coordinator of Student Housing. A two week prior notice of intent to vacate should be made with the householder or the Housing office in case of College housing, whenever a student intends to vacate a living accommodation. Rents are payable in advance. Accounts become delinquent 5 days after scheduled payment date. A penalty of $1.00 late fee plus 10c per day thereafter is imposed. Security deposits are forfeited for failure to comply with a two week prior “Notice of Intent to Vacate.” Cancellation date is two weeks prior to beginning of any quarter. Refunds are not allowable beyond that time.

Dogs, cats or other similar pets are strictly forbidden within the College Housing area. Very few private home owners permit pets.

Freshmen girls are encouraged to live in supervised housing, except those who live with parents or relatives.

STUDENT LOANS

It is the earnest desire of the institution that no student be prevented from completing school because of some temporary financial limitation. As a phase of the program of financial aid to students, small loans are made available on a business-like basis. These are available to all students on the basis of their qualifications and need for financial assistance.

Individual financial problems may be discussed with the Chairman of Student Loans, Main Building, Room 324.

The total Student Loan Fund is composed of the following individual loan funds generously contributed by friends of U. S. A. C.:

U. S. A. C. Faculty Women’s League has a loan fund for women students of College. Loans may range from $50 to $150. Preference is given Seniors.

U. S. A. C. Faculty Women’s League Revolving Loan Fund provides for short time loans, not to exceed $20, to women students for emergency purposes.

Senior Loan Fund, a gift of the class of 1911, and added to by the class of 1922, has helped many students complete school.

Rotary Club Senior Loan Fund. The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year.

Robert L. Judd Loan Fund was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and need financial assistance.

W. B. Rice Memorial Loan Fund provides loans of up to $200.00, usually for one year, to deserving students in the School of Forest, Range and Wildlife Management. Application is made to the Dean’s office.

Bureau of Land Management Loan Fund provides loans up to $100.00 to deserving students in the School of Forest, Range, and Wildlife Management. Application should be made to the Dean’s office.

Marjorie Poulson Loan Fund. A fund provided by the father of a former Aggie student active in student body affairs.

Ichel Waters Loan Fund. An individual gift to assist students in need.

J. Reuben Clark Small Loan Fund. A reserve specifically provided for assistance to students in meeting school obligations.
O. W. Israelsen Loan Fund available to senior engineering students only. Application is made in the School of Engineering and Technology. School of Forestry has a small loan fund for students enrolled in that school.

ORIENTATION

A program of activities designed to acquaint students with the life and environment of the college community. New students at the beginning of each quarter are provided with instruction, assistance, and entertainment as specific ways of becoming oriented to college atmosphere, traditions, policies and procedures.

SCHOLARSHIPS AND GRANTS-IN-AID

(Awards primarily for new students)

Applications for scholarships and grants-in-aid for the succeeding year should be made before March 1. Direct inquiries to Chairman, Scholarships and Grants-in-Aid Committee, Office of Student Personnel Services.

The College grants annually to students scholarships covering from one to three quarters' tuition each on the basis of outstanding academic ability or demonstrated academic ability and outstanding 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 College also awards grants-in-aid to help deserving students with good academic ability who have economic need.

To be eligible for a grant-in-aid, an athlete must meet either of the following requirements:

1. A freshman must have been academically rated as in the upper two-thirds of his high school graduating class. For the first year such award shall be made on an annual basis.

2. A student, other than a freshman, must be in good academic standing and not on probation. Such award shall be made on a quarterly basis.

All of the above awards are under the jurisdiction of a Scholarships and Grants-in-Aid 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 said committee, the recipient has clearly demonstrated his failure to comply with both the spirit and the letter of the original terms of the scholarship or grant-in-aid.

Tuition Scholarships. The President of the College is authorized by Title 53, Chapter 34, Section 1-a, Utah Code Annotated, 1953, to waive registration and tuition fees in full or in part for a limited number of meritorious or impecunious students whose domicile is in the state of Utah.

Logan Kiwanis Club. Three $100 scholarships awarded to outstanding students who are in need of financial assistance.

Logan Lions Club. Three $100 scholarships awarded to outstanding students who are in need of financial assistance.

Logan Rotary Club. Three $100 scholarships awarded to outstanding students who are in need of financial assistance.

KVNU Scholarship. A $100 scholarship. $50 is awarded fall quarter, $25 winter quarter, $25 spring quarter, to the winner of the Dairy Darling Contest.

Palmer Scholarships. Mr. and Mrs. Val. W. Palmer made a gift of $10,000 as a scholarship fund. Five scholarships of $200 each are awarded each year to students of outstanding scholarship and leadership ability.
Home Economics Scholarship. The faculty of the school of home economics awards one $100 scholarship to a high school graduate who shows special interest and ability in the field of home economics.

Faculty Women’s League Annual Freshman Scholarship provides tuition for one year for a freshman woman. Selection is based on need, scholarship, and leadership.

The following 4-H Club scholarships are available to Utah 4-H Club members. (Additional information may be obtained from county agents.)

Carl Raymond Gray Scholarships. The Union Pacific Railroad awards 16 scholarships annually to Juniors or Seniors in high school who are enrolled as 4-H Club members. These members scholarships are $100 each and are to be used at Utah State Agricultural College or its branches. The scholarships are available in the following counties:

<table>
<thead>
<tr>
<th>County</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver</td>
<td>Iron</td>
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<tr>
<td>Box Elder</td>
<td>Juab</td>
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<tr>
<td>Cache</td>
<td>Kane</td>
</tr>
<tr>
<td>Davis</td>
<td>Millard</td>
</tr>
<tr>
<td>Morgan</td>
<td>Tooole</td>
</tr>
<tr>
<td>Rich</td>
<td>Utah</td>
</tr>
<tr>
<td>Salt Lake</td>
<td>Washington</td>
</tr>
<tr>
<td>Summit</td>
<td>Weber</td>
</tr>
</tbody>
</table>

Standard Oil Scholarships. The Standard Oil Co. of California offers 5 scholarships to 4-H Club members in Utah as follows: $350.00, 1st; $300.00, 2nd; $250.00, 3rd; $250.00, 4th; and $200.00, 5th.

Utah Dairy Federation. The Utah Dairy Federation gives an annual scholarship of $100 each to a 4-H boy and a 4-H girl who will enroll in Dairy or Home Economics at U.S.A.C.

National 4-H Club Contests. National scholarships of $300 each are available to 4-H Club members in at least 22 different projects or activities.

Sears Roebuck and Company Scholarships. For Freshmen in the School of Agriculture the company offers 13 scholarships of $200 each, $75 of which is paid at the beginning of the fall term, $75 at the beginning of the winter term and $50 at the beginning of the spring term. Winners are determined on the basis of scholarship, interest in agriculture, financial need, and leadership. The winner who has the best scholarship record at the end of his freshman year, receives an additional scholarship for use in his sophomore year. Application blanks and information may be obtained from the Dean’s office.

SPEECH CLINIC

The Speech Clinic provides individual help and special classes for persons having speech handicaps. In addition to the speech and hearing examination required of all new students, remedial training is available to anyone. The types of problems handled include stuttering or stammering, stage fright, delayed speech development in children, baby talk, lisping and other articulation disorders, cleft palate speech, paralytic speech, “nervous” speech conditions, nasal speech, voice quality deviations, etc. All college students who have defective speech should register in the speech clinic, where they will receive attention. These services are also available to non-college students.
COLLEGE CITIZENSHIP

Students in a state-supported, land-grant college like the U. S. A. C. are expected to lead in setting high standards of conduct. The College relies primarily on the good taste and sense of personal responsibility on the part of its students for the high level of behavior generally maintained. So that newcomers to our campus can be readily informed, the following well-established rules and traditions are listed:

A. The College has a long tradition of no smoking in College buildings.

B. Alcoholic beverages are not used on campus, in college-supervised living quarters, or at any social function. Intoxicated individuals may be requested to leave college functions.

C. A code of personal honor is traditional at Utah State Agricultural College. Cheating is neither condoned nor accepted.

D. The friendliness and informality at Utah State are vital to the success of the College. As an Aggie, you have an obligation to be friendly.

E. A good citizen pays his bills. Now that you are on your own on the Aggie Campus, you should pay yours.

RELIGION

The officers of the College are deeply interested in the spiritual and moral growth of the students. Every student is encouraged to affiliate with the church of his choice immediately upon registering at the College.

Outstanding religious leaders of the Latter-day Saint, Protestant and Catholic faiths cooperate with the College in serving the students of their respective churches. Accredited courses in religion are also offered by scholars representing each of these groups. An L. D. S. Institute, with a staff of four well trained instructors and an enrollment of more than 1000 students, is adjacent to the campus.

COURSES OF INSTRUCTION

The courses of instruction offered by the College are listed under the names of the seven academic Schools.

Courses numbered below 100 are Lower Division courses. Courses numbered above 100 are Upper Division courses. These may be pursued by a Freshman or a Sophomore only with permission of the Instructor of the course and the student’s Dean.

Courses numbered above 200 are Graduate courses. Many Upper Division courses also yield Graduate credit.

The amount of credit in quarter hours for a course and the quarter in which the course is given are indicated in parentheses at the end of the course description. “F” is the abbreviation for Fall, “W” for Winter, “S” for Spring, and “Su” for Summer.
SCHOOL OF AGRICULTURE
R. H. WALKER, DEAN

<table>
<thead>
<tr>
<th>Department</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>77</td>
</tr>
<tr>
<td>Agricultural Economics and Marketing</td>
<td>80</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>83</td>
</tr>
<tr>
<td>Agronomy</td>
<td>85</td>
</tr>
<tr>
<td>Animal Husbandry</td>
<td>90</td>
</tr>
<tr>
<td>Applied Statistics</td>
<td>90</td>
</tr>
<tr>
<td>Botany and Plant Pathology</td>
<td>93</td>
</tr>
<tr>
<td>Dairy Industry</td>
<td>95</td>
</tr>
<tr>
<td>Horticulture</td>
<td>98</td>
</tr>
<tr>
<td>Poultry Husbandry</td>
<td>101</td>
</tr>
<tr>
<td>Veterinary Science</td>
<td>103</td>
</tr>
</tbody>
</table>
The best trained person receives the best employment opportunities in agriculture as in other occupations. Opportunities in crop and livestock production, marketing, extension work, teaching, research, positions in agriculture in the foreign service, and in various businesses related to agriculture await students who have adequate technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest and disease control methods are needed to rehabilitate under-developed territories. Increase of soil fertility by prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution. Thus a great opportunity and a challenge await students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

Utah State Agricultural College is well equipped to train young men to meet these needs. Technical courses are given in crop and animal production, agricultural economics, rural social science, soil management, mechanic arts, and other basic sciences that underlie practical agriculture. Training is also given in English, literature, history, political science, the fine arts, hygiene and public health, and education, all of which supplement the practical, scientific agricultural training and contribute to the well-rounded education of students.

Instruction includes both the principles and practice of agriculture. A new agricultural science building provides the most modern laboratory equipment. The college farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards, and technical equipment offer excellent opportunities for combining scientific study with practical experience. A new milking parlor and modern dairy set up provide the most modern facilities for student training. Outstanding representatives of principal livestock and poultry breeds best adapted to Utah conditions afford a “standard of perfection” in desirable type and form for the student judge.

The College maintains an outstanding herd of Hereford and Shorthorn beef cattle. The Sears-Roebuck Foundation has given $12,000 towards purchase of foundation beef cattle. Rambouillet, Columbia, Hampshire, Southdown, and Targhee breeds of sheep are maintained for comparative study. Kennecott Copper Company has given $25,000 to the College toward the breeding and selection of more open-faced sheep of the Rambouillet breed. Duroc and Yorkshire swine are also kept. The dairy herd is made up of purebred Jersey and Holstein-Friesian cattle. The important breeds of chickens and turkeys are available at the new poultry and turkey farms. These animals afford teaching materials and experience in the care and handling of livestock.

Utah Agricultural Experiment Station is devising better methods of feeding and cropping, is developing more valuable strains of fruits, crops, and livestock, and more remunerative systems of marketing agricultural products. These activities are studied by the students first hand, and student employment enables many to take active part in the research work of the Experiment Station. This arrangement gives the student clear insight into scientific methods and valuable practical experience. Special attention is given 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 School of Agriculture is shown by the records of graduates who have gone back to the farm, or have become specialists as teachers or investigators, and have become leaders in their chosen work.
Students entering the School of Agriculture may pursue one of three courses leading to the Bachelor of Science degree in Agriculture, as follows:

1. General Agriculture, which is designed to meet the needs of the student who desires a broad training in scientific and practical agriculture.

2. Specialized Agriculture, in which the student chooses to specialize or major in one department of the School of Agriculture.

3. Technical Agriculture, which is for the student who plans to pursue graduate study in one of the basic agricultural sciences, or who plans to enter employment in which technical agricultural training is required.

**GENERAL AGRICULTURE**

The course in general agriculture is designed to meet the needs of students who desire a broad general training in scientific and practical agriculture. The curriculum for this course is partially prescribed as outlined below.

Unless the student has chosen a specific phase of agriculture in which to major, it is usually best for him to follow the curriculum in General Agriculture for two years. Later, when he decides to major in a specific field, he can arrange his major course without serious complications.

The prescribed courses and minimum number of credits in the various fields are as follows:

(a) Minimum Requirements in Following Divisions:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural economics</td>
<td>9</td>
</tr>
<tr>
<td>*Applied plant sciences</td>
<td>26</td>
</tr>
<tr>
<td>**Applied animal sciences</td>
<td>26</td>
</tr>
<tr>
<td>Engineering and technology</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70</td>
</tr>
</tbody>
</table>

(b) Physical Science, Biology, Social Science, and Language and Arts:

<table>
<thead>
<tr>
<th>Physical Science</th>
<th>Credits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 34 or 35</td>
<td>3 or 5</td>
<td></td>
</tr>
<tr>
<td>Chem. 10, 11 &amp; 12 or 3, 4 &amp; 5</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td>18 or 20</td>
</tr>
<tr>
<td>Botany 24 or 25</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Bacteriology 10 or 70 &amp; 71</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Zoology 2 or 3 &amp; 4</td>
<td>5 or 10</td>
<td></td>
</tr>
<tr>
<td>Zoology 112</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Entomology 108</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Botany 130</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Principles of Economics 53</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other social science courses</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>(See College group requirements)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Language and Arts</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Basic Communications 1, 2, 3</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>College group requirement</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>(See College group requirements)</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>(c) Military Science or Physical Education</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Total credits prescribed</strong></td>
<td>151</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>35</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>186</td>
<td></td>
</tr>
</tbody>
</table>

Courses to be selected from agronomy and horticulture.

Courses to be selected from animal husbandry, dairy industry, poultry husbandry, and veterinary science.

Soils 56 is required as part of the 26 credits.
SPECIALIZED AGRICULTURE

A student may major in one of the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, Bacteriology and Public Health, Botany and Plant Pathology, Dairy Husbandry, Horticulture, Poultry Husbandry, or Zoology, Entomology and Physiology. Information concerning the curriculum for a major in any of these departments may be obtained from the head of the major department, who should be consulted before registering.

In addition to major and minor requirements as specified by each department, the student majoring in specialized agriculture is required to take a minimum of one 3-credit course in each of two departments in the applied plant sciences and one 3-credit course in each of two departments in applied animal sciences.

He must also complete the following:

- Mathematics 34 or 35
- Chemistry 10, 11 & 12 or 3, 4 & 5
  (Majors in agricultural economics may substitute Physical Science 31 and 32 and another 5 hours of exact science for 16 hours of chemistry)

A minimum of 14 credits in the following courses:

- Botany 24 and 25
- Zoology 2, 3 and 4
- Bacteriology 10 or 70, 71
- Zoology or Botany 1
- Physiology 4
  (See various department course requirements in this group. Zool. 1, Bot. 1, and Physiology 4 are not accepted by some departments)
- Prin. of Econ. 53, 5 credits; and two additional 3-credit courses
- Social science group, 8 credits
- Language and arts groups, 8 credits
- Basic Communications, 9 credits
- Agron. 56

A total of 186 credits, 60 of which are of Upper Division grade, and a minimum of 1 credit each term for six terms in military science or physical education are required for graduation from the School of Agriculture.

TECHNICAL COURSES

For students who plan to do graduate work or to enter employment in which technical training is required, technical courses are provided in each of the departments. Students may register for these courses only upon permission of the department and the dean.

NON-DEGREE COURSE IN AGRICULTURE

The School of Agriculture offers a 2-year non-degree course in practical agriculture for students who do not wish to take more than two years of college work. A student may register for any of the regular non-prerequisite production, marketing, and management courses in the School 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, the student is required to take six
credits in the groups in which he does not major. For example, a student majoring in animal science must complete in addition to 20 credits in his major field, 6 credits in plant science, 6 credits in agricultural economics, and 6 credits in agricultural engineering. He is also required to take the following courses:

- Biology, 5 credits; Basic Communications, 9 credits; Physical Science, 5 credits; and Social Science, 5 credits.

The following courses are open to students in the non-degree course in Agriculture: Agricultural Economics 53, 58, 63, 70; Agricultural Engineering 14, 15; Agronomy 6, 7, 8, 56; Animal Husbandry 1, 10, 15; Dairy Husbandry 1, 3, 6, 7; Horticulture 1, 8, 10; Irrigation and Drainage 10; Landscape Architecture 3; Poultry Husbandry 1, 2, 8; Veterinary Science 20.

Students in the non-degree course must complete 96 credits to obtain a certificate.

Agricultural Economics and Marketing

G. T. Blanch, Professor and Head of Department; R. H. Anderson, E. M. Morrison, E. W. Lamborn, Associate Professors; Lynn H. Davis, Douglas C. Strong, Assistant Professors; Jane U. Sandberg, Research Assistant; M. H. Taylor, Leon C. Michaelson, Extension Economists; Clyde E. Stewart, Collaborator in Research, U.S.D.A.

W. P. Thomas, Professor Emeritus.

Master of Science Degree. The Department of Agricultural Economics offers opportunity for research and graduate study leading to a master of science degree. The facilities of the department for training graduate students in general agricultural economics, farm management, land economics, agricultural finance, marketing, and prices are augmented by the research investigations conducted by the department staff and the federal collaborator with the assistance of graduate students. The following courses in Agricultural Economics may be used for graduate credit: 102, 104, 105, 106, 112, 114, 115, 116, 120, 121, 155, 163, 180.

Agricultural Economics 53 or its equivalent is prerequisite to all other courses in Agricultural Economics.
# Suggested Course of Study for Major in Agricultural Economics in School of Agriculture

## Exact Sciences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 34</td>
<td>3*</td>
</tr>
<tr>
<td>Math. 35</td>
<td>5*</td>
</tr>
<tr>
<td>Chem. 10</td>
<td></td>
</tr>
<tr>
<td>or Physical Sci. 31</td>
<td>5†</td>
</tr>
<tr>
<td>Chem. 11</td>
<td></td>
</tr>
<tr>
<td>or Physical Sci. 32</td>
<td>5†</td>
</tr>
<tr>
<td>Chem. 12 or 5 hrs. in another exact science</td>
<td>5†</td>
</tr>
</tbody>
</table>

Total: 18 or 20

*One of these is required

## Biological Sciences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zool. 1 or Botany 1</td>
<td>5</td>
</tr>
<tr>
<td>Bact. 10 or 70 &amp; 71</td>
<td>5</td>
</tr>
<tr>
<td>Physiology 4</td>
<td>5</td>
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</table>

Total: 15

*14 credits required

## Social Sciences (Excl. Econ.):

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Sociology 10</td>
<td>5</td>
</tr>
<tr>
<td>Pol. Sci. 10</td>
<td>5</td>
</tr>
<tr>
<td>Sociology 141</td>
<td>3</td>
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</table>

Total: 13

## Languages and Arts:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech 1</td>
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<tr>
<td>English 40</td>
<td>5</td>
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</table>

Total: 10*

*A minimum of 8 credits required

## English Composition:

<table>
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<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Basic Communications</td>
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</tbody>
</table>

Total: 9

## Military Science or Physical Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

*These or equivalent course required

## Journalism:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Journalism 12</td>
<td>3</td>
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<tr>
<td>Journalism 120</td>
<td>3</td>
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Total: 6

*These or equivalent courses required

## Economics:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Economics 52</td>
<td>5†</td>
</tr>
<tr>
<td>Economics 107</td>
<td>3†</td>
</tr>
<tr>
<td>Economics 108</td>
<td>3†</td>
</tr>
<tr>
<td>Economics 155</td>
<td>3</td>
</tr>
<tr>
<td>Economics 165</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
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Total: 20*

## Business Administration:

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<tbody>
<tr>
<td>Accounting 1 or 109</td>
<td>5 or 3</td>
</tr>
<tr>
<td>Other</td>
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Total: 15*

*A minimum of 6 credits required

## Applied Plant Science and Soils:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Agron. 56</td>
<td>4†</td>
</tr>
<tr>
<td>Agron. 6</td>
<td>1</td>
</tr>
<tr>
<td>Veg. Crops 1</td>
<td>3</td>
</tr>
<tr>
<td>Hort. 1</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
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</table>

Total: 18*

*A minimum of 12 credits required

## Applied Animal Sciences:

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>An. Hus. 1</td>
<td>3</td>
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<tr>
<td>An. Hus. 10</td>
<td>5</td>
</tr>
<tr>
<td>Dairy 1 or 109</td>
<td>3</td>
</tr>
<tr>
<td>Poultry 1</td>
<td>3</td>
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<tr>
<td>Other</td>
<td>4</td>
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</table>

Total: 18*

*A minimum of 12 credits required

## Agricultural Engineering:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Irri. &amp; Drainage 10 or 112</td>
<td>3 or 4</td>
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<tr>
<td>Ag. Eng. 15</td>
<td>3</td>
</tr>
<tr>
<td>Ag. Eng. 105</td>
<td>5</td>
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Total: 13 or 14

## Statistics:

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<tr>
<td>Appl. Stat. 131</td>
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<tr>
<td>Appl. Stat. 132</td>
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Total: 6

## Major:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Ag. Econ. 53†, 58†, 63†, 102†, 105, 106, 112, 120, 121†, 155, 163†</td>
<td>37</td>
</tr>
</tbody>
</table>

Total: 37
Rural Economy

53. Fundamentals of Agricultural Economics. A basic introduction to the field and principles of Agricultural Economics. (5F, W, S) Staff


112. Farm Cooperatives. Principles of cooperation, organization, operation and management of cooperative sales, purchasing, and service associations. (3F) Davis

113. Analysis of Farm Cooperatives. Primarily to give advanced training and experience in agricultural cooperation. Prerequisite or taken simultaneously: Ag. Econ. 112. Taught alternate years. Not taught 1956-57.


180. Agricultural Policies. An economic analysis of selected agricultural problems, together with government policies and programs associated therewith. (3W) Blanch

230, 231, 232. Seminar in Agricultural Economics. Review and discussion of economic problems, principles and techniques in Farm Management, Agricultural Marketing and Rural Economy. (1F, W, S) Staff

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

Farm Management, Land Economics, and Agricultural Credit

58. Introductory Farm Management. A case-problem approach to the basic considerations of organizing the productive resources of a farm using the farm plan, using labor and power efficiently, and measuring the farm business success. (3F, S) Morrison

70. Farm Accounts. Farm accounts and their application to the organization and management of farms and to filing of income tax statements. (3S) Strong

102. Intermediate Farm Management. Principles underlying organization and operation of farms for maximum returns with special emphasis on economic laws underlying production function and combinations. Designed for majors in Agricultural Economics and other students preparing for work as farm operators or specialists with farm people. (3W) Blanch


202. Advanced Farm Management. Primarily to give students advanced training and experience in farm management. Prerequisite: Ag. Econ. 102. (3S) Morrison

Marketing and Prices

62. **Principles of Marketing.** Principles, methods, and practices of marketing. (5F, W) Anderson

63. **Marketing Agricultural Products.** Economic principles, marketing agencies, functions, and channels of distribution. (3S) Staff


115. **Marketing Poultry and Dairy Products.** Principles of marketing applied to marketing poultry and dairy products. Taught in alternate years. (3W) Anderson

116. **Marketing Livestock and Livestock Products.** Principles of marketing applied to marketing livestock and livestock products. (3F) Davis

120. **Agricultural Prices.** Economic principles underlying prices. Factors, policies, and programs as they relate to and influence agricultural prices. (3S) Lamborn

121. **Statistical Analysis.** Statistical techniques applied to Agricultural Economics data. (3S) Strong

163. **Intermediate Marketing.** Principles of marketing and their application to specific problems. Taught in alternate years, not taught 1956-57.

General Graduate Courses

214. **Research in Agricultural Economics.** Thesis. Any quarter. Time and credit arranged. Staff

215. **Special Problems in Agricultural Economics.** Any quarter. Time and credit arranged. Staff

240. **Research Methods in Agricultural Economics.** (2F) Blanch

241. **Research Methods in Agricultural Economics.** Prerequisite: Agr. Econ. 240 (2W) Blanch

Agricultural Education

S. S. Richardson, Professor and Head of Department.

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

Master of Science Degree

Opportunity is offered for research and graduate study in Agricultural Education through any major department in the School of Agriculture. Students planning to do graduate work should select a co-ordinated program of study in the Schools of Agriculture and Education.
Prescribed Course for Majors in Agricultural Education
Institutional and General Requirements

<table>
<thead>
<tr>
<th>Biological Sciences:</th>
<th>Cr. Tot.</th>
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<tbody>
<tr>
<td>*Botany 24</td>
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</tr>
<tr>
<td>*Zoology 2</td>
<td></td>
</tr>
<tr>
<td>Zoology 112 (Genetics)</td>
<td></td>
</tr>
<tr>
<td>*Bacteriology 10, or 70 &amp; 71</td>
<td></td>
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<tr>
<td></td>
<td>20</td>
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<tr>
<td>Social Sciences:</td>
<td></td>
</tr>
<tr>
<td>*Agr. Econ. 53</td>
<td></td>
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<tr>
<td>*Sociology 10, or 70, or 70</td>
<td></td>
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<tr>
<td>*Political Science 10, or 70</td>
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<tr>
<td>*History 14</td>
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<table>
<thead>
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<tbody>
<tr>
<td>*Landscape Architecture</td>
<td>3</td>
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<tr>
<td>*Speech, or Music, or Art or Literature</td>
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<tr>
<td>English:</td>
<td></td>
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<tr>
<td>Basic Communications 1, 2, 3</td>
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| Exact Science:                               |          |
| *Chemistry 10, 11, 12                       | 15       |
| *Mathematics 34                             | 3        |
| Radio 21, Physics 3 or 6                    | 4        |
| or 7, Geology 3                             | 22       |

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

<table>
<thead>
<tr>
<th>Animal Industry‡</th>
<th>Cr. Tot.</th>
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<tr>
<td>An. Hus. 10</td>
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<td>Elective</td>
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<td></td>
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<tr>
<td>Plant Industry‡</td>
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<tr>
<td>Agron. 56 (Soils)</td>
<td>4</td>
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<tr>
<td>Elective</td>
<td>16</td>
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<tr>
<td></td>
<td>20</td>
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<tr>
<td>Agricultural Economics</td>
<td></td>
</tr>
<tr>
<td>Agron. 56 or 102, 63</td>
<td>6</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Agricultural Engineering*</td>
<td></td>
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<tr>
<td>Irrig. 10</td>
<td>4</td>
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<tr>
<td>Elective</td>
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<table>
<thead>
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<th>Education</th>
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<td>Education 112, 113, 114</td>
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<td>22</td>
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<tr>
<td>Psychology 102</td>
<td>5</td>
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<tr>
<td>Public Health 155</td>
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<td>Elective</td>
<td>3</td>
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<td></td>
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<td>Total Minimum Requirements</td>
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<td>For B. S. Degree</td>
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<tr>
<td>Institutional and General</td>
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<tr>
<td>Agriculture</td>
<td>80</td>
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<tr>
<td>Education</td>
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<tr>
<td>Military Science &amp; F. E.</td>
<td>6</td>
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<tr>
<td></td>
<td>192</td>
</tr>
</tbody>
</table>

| Total                                      |          |
|                                            |          |

*Courses which meet lower division group requirements.
†Elective courses must be selected from at least two departments.

Courses


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

125. Methods of Teaching Agriculture. Fundamental principles and practices of all teaching. Special attention is given to selection, organization, and teaching of subject matter and supervision of agricultural activities on the farm. (5W) Richardson
126. Directed Teaching in Agriculture. Student observation and teaching under supervision in approved local vocational agricultural departments. Student teachers leave the campus to train in selected high schools for a full teaching program for five or six weeks. (4-8 W or S)

128. Auxiliary Problems. Developing a sound F. F. A. program, for leadership and educational contests. (3F) Richardson


225. Special Problems in Agricultural Education. A consideration of needs of individual upper division and graduate students and special types of service. (1-2; S) Richardson

226. Young Farmer and Adult Classes. Fundamental principles and techniques in organization and instruction of young farmers and of adults in farming occupations. (3S) Richardson

Agronomy


Bachelor of Science Degree in Agronomy

Study and research in Agronomy focus upon problems of crop production and soil conservation in arid regions. Course offerings emphasize interrelations 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 within the department: General Agronomy, Soil Conservation, Technical Field Crops, and Technical Soils. In addition, a joint major termed Irrigation and Soils is offered between the departments of Agronomy and Irrigation and Drainage.

Every candidate for the Bachelor of Science degree in Agronomy is required to demonstrate a reasonable knowledge and skill in common farm operations.

Major in General Agronomy

A major in General Agronomy prepares the student for positions related to the management of soils and the production of field crops. Training in general agronomy is preparatory to civil service positions such as agronomist, conservationist, farm planners and soil scientists. Many Agronomy majors are also employed in commercial fields such as field men for sugar beet companies, seed companies, fertilizer distributors, and canning companies. Special course outlines have been prepared to train students for such positions. Studies in General Agronomy are also designed to train students who desire to farm, to be county agricultural agents, or to take field positions related to soils or crop production with various other state and federal agencies. Students majoring in General Agronomy may partially specialize in either crops or soils.
In addition to the general requirements of the college and the School of Agriculture all majors in General Agronomy must take Geol. 3; Bot. 24, 25, and 120 or 130; Bact. 10; Ent. 108; Math. 35, 44; Agronomy 7, 8, 56, 103, 107, 111, 112, 113, 118, 155, and either 109 or 114. A minimum of one summer of practical farm experience is required of all majors in General Agronomy before graduation.

**Major in Soil Conservation**

A major in Soil Conservation prepares the student for employment as a specialist in the Soil Conservation Service, the Soil Conservation Division of the Indian Service, Soil Surveyors, Soil Scientists in the Bureau of Reclamation, as well as other positions related to the reclamation and conservation of soil and water resources.

In addition to the general requirements of the college and the School of Agriculture, all majors in Soil Conservation must take: Geol. 3 and 115; Bot. 24, 25 and 120 or 130; Bact. 10; Math. 35 and 44; Irrig. and Dr. 10; Engr. Dr. 60 or 61 and 62; Civil Engr. 81 or 84, and 171; Range Mgt. 180; and Agronomy 7, 8, 56, 103, 107, 111, 112, 113, 114, 118 and 155. A minimum of one summer of practical farm experience is required of all majors in Soil Conservation before graduation.

**Major in Technical Field Crops**

Majors in Technical Field Crops are prepared for graduate work and technical employment in plant breeding, crop production, weed control and seed technology. Students having high scholastic standing and special aptitude in the fundamental sciences who are interested in the plant sciences find real opportunity in this major.

In addition to general college requirements, majors in Technical Field Crops should take Bact. 10 or 70 and 71; Bot. 24, 25, 30, and 120 or 130; Chemistry 3, 4, 5 and 125 and 126 or 12 and 115; Mathematics through 99; Physics 6 and 7 or 17, 18, 19; Geology 3; Ag. Econ. 53; Animal Science, 5 hours; Horticulture, 3 hrs.; I. D. 10 or 112, and Agronomy 7, 8, 56, 103, 107, 108, 111, 112, 113, 118, 120, 131, 132, and 155.

**Major in Technical Soils**

Majors in Technical Soils are prepared for graduate work and technical employment in research, soil testing, land classification, and soil management. Students having high scholastic standing and marked ability in the fundamental sciences find real opportunities in this major.

In addition to general college requirements, majors in Technical Soils should take Bact. 10 or 70 and 71; Bot. 24, 25, 120; Chemistry 3, 4, 5 and 17 and 18 or 115; Physics 17, 18, 19; 5 hrs. of either Organic Chem. or Advanced Physics; Math. through 99; Geol. 3; Ag. Econ. 53 and 102; An. Sci., 5 hrs.; Hort. 3 hrs.; I. D. 10 or 112; Applied Statistics 131, 132; Agronomy 7 or 8, 56, 103, 107, 111, 112, 113, 114, 155, 165.

**Major in Irrigation and Soils**

This joint major between the departments of Agronomy and Irrigation and Drainage is designed for students who wish to specialize in problems related to the management of land and water in irrigation agriculture without specializing in technical engineering phases of irrigation. Extension specialists, civil service positions, and farm managers represent some types of employment available to graduates in this field.

In addition to general college requirements, majors in Irrigation and Soils should take Bot. 24, 25; Chem. 3, 4, 5; Math. through 99; Physics 17, 18, 19; Geol. 3; Ag. Econ. 53, 102; I. D. 112, 145, 149, 160; Eng. Drawing 61, 62; C. E. 81 or 84; An. Sci., 5 hrs.; Hort., 3 hrs.; Agronomy 7 or 112, 125, 126, 130, 131, 132, and 114.
Master of Science Degree

The Agronomy Department offers opportunity for study and research toward the Master of Science degree. A year of graduate study in the department is also accepted by other colleges and universities as a year toward a Ph.D. degree in the subject pursued. The outline of studies and the research program are designed around the objectives of the individual student. The department in co-operation with related departments, is prepared to give strong programs in various phases of plant breeding, crop production, weed control, soil chemistry, soil physics, soil conservation, soil management, and soils and irrigation.

The following courses are acceptable for graduate credit toward the Master of Science degree in Agronomy: 109, 110, 120, 155, 165; in addition, for students majoring in crops, 107.

The following courses are acceptable for graduate credit toward the Master of Science degree in departments other than Agronomy: 103, 107, 109, 110, 114, 116, 117, 120, 121, 155, and 165.

Doctor of Philosophy Degree

The Agronomy Department in co-operation with related departments is approved for the offering of advanced study and research for the attainment of the degree of Doctor of Philosophy in specialized fields of soil science related to irrigation agriculture. Detailed information may be obtained from the department or from the Dean of the Graduate School.

Suggested Course of Study for Majors in General Agronomy

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Cr.</th>
<th>Junior</th>
<th>Cr.</th>
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<tr>
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<td><strong>Courses</strong></td>
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<tr>
<td>Math. 34, 35, 44</td>
<td>...</td>
<td>Agron. 103, 107, 118</td>
<td>...</td>
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<tr>
<td>Bot. 24, 25</td>
<td>...</td>
<td>Bact. 10</td>
<td>...</td>
</tr>
<tr>
<td>Eng. 1, 2, 3</td>
<td>...</td>
<td>Agr. Econ. 53, 58, 63</td>
<td>...</td>
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<tr>
<td>Agron. 8</td>
<td>...</td>
<td>*Ent. 108</td>
<td>...</td>
</tr>
<tr>
<td>Poultry 1 &amp; 2</td>
<td>...</td>
<td>Soc. Sci.</td>
<td>...</td>
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<tr>
<td>Hort. 4</td>
<td>...</td>
<td>Dairy 109</td>
<td>...</td>
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<td>Hort. 1</td>
<td>...</td>
<td>Lib. Sci. 106</td>
<td>...</td>
</tr>
<tr>
<td>P. E. or M. Sci.</td>
<td>...</td>
<td>Phys. 6</td>
<td>...</td>
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<tr>
<td>*</td>
<td></td>
<td>Land Arch. 3</td>
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<table>
<thead>
<tr>
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<td><strong>Courses</strong></td>
<td>Cr.</td>
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<td>Chem. 3, 4, 5, 12 or</td>
<td>...</td>
<td>Agron. 111, 112, 113</td>
<td>...</td>
</tr>
<tr>
<td>10, 11, 12</td>
<td>...</td>
<td>Agron. 114, 155</td>
<td>...</td>
</tr>
<tr>
<td>Geol. 3</td>
<td>...</td>
<td>*Agron. 109 or 165</td>
<td>...</td>
</tr>
<tr>
<td>Lit. or Art.</td>
<td>...</td>
<td>Bot. 130</td>
<td>...</td>
</tr>
<tr>
<td>Agron. 7, 56</td>
<td>...</td>
<td>*Zool. 112 or Geol. 115</td>
<td>...</td>
</tr>
<tr>
<td>An. Hus. 10</td>
<td>...</td>
<td>Range Mgt. 160</td>
<td>...</td>
</tr>
<tr>
<td>Irrig. &amp; Dr. 10</td>
<td>...</td>
<td>An. Sci. Elect.</td>
<td>...</td>
</tr>
<tr>
<td>P. E. or M. Sci.</td>
<td>...</td>
<td>*Agr. Ed. 151</td>
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<td><strong>Courses</strong></td>
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<td><strong>Courses</strong></td>
<td>Cr.</td>
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<td>Agron. 111</td>
<td>...</td>
<td>Agron. 116, 150</td>
<td>...</td>
</tr>
<tr>
<td>*Agron. 109 or 165</td>
<td>...</td>
<td>Eng. Dr. 60</td>
<td>...</td>
</tr>
<tr>
<td>Bot. 130</td>
<td>...</td>
<td>C. E. 81 and 171</td>
<td>...</td>
</tr>
<tr>
<td>*Zool. 112 or Geol. 115</td>
<td>...</td>
<td>Ent. 151</td>
<td>...</td>
</tr>
<tr>
<td>Range Mgt. 160</td>
<td>...</td>
<td>Electives</td>
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</tr>
<tr>
<td>An. Sci. Elect.</td>
<td>...</td>
<td>...</td>
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</tr>
</tbody>
</table>

For a Soil Conservation major, substitute the following courses for those marked (*): Geol. 115, Agron. 160, 110, Engr. Dr. 60, C. E. 81 and 171.

Farm Crops

7. Grain Crops. The classification, history and cultural methods involved in the production of grain crops. Two lectures, 1 lab. (3W or S) McAllister
8. Root and Miscellaneous Crops. Sugar beets, potatoes, tobacco and fiber crops are studied as to cultural methods, market types and commercial possibilities. Three lectures. (3F or W) Bennett

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, 1 lab. (4F or S) Bennett

109. Plant Breeding. Principles, techniques, and practices in breeding improved varieties of crop plants. Prerequisite: Zool. 112. Three lectures, one 3-hour lab. (4F) Tingey

116. Weeds. Identification of weeds and plants, the weed problems in agriculture and methods of control. An assessment is made for field trips. Two lectures, one 3-hour lab. (3F) Tingey

120. Field Crop Seed Production. Methods, problems, and commercial possibilities of field crop seed production in the Intermountain West. Two lectures. (2W) McAllister

121. Seed Analysis and Grading. Impurities of crop seeds; methods of analysis and testing; seed inspection; application of federal standards in the grading of field crops. Two 3-hour labs. (2S) McAllister

124. Advanced Judging, Grading and Identification. Prerequisites: Agron. 6, 118 and 121. Two 3-hour labs. (2F) McAllister

201. Hays and Pastures. Recent advances in current problems related to the production and utilization of hays and pastures. Prerequisite: Agron 6 and 103 or equivalent. Three lectures. (3W) Bennett

203. Sugar Beets and Potatoes. Recent advances in improvement and production. Prerequisite: Agron. 8. Two lectures. (2F) Bennett

204. Cereal Crops. Recent advances in the improvement and production of cereal crops. Prerequisite: Agron. 7. Two lectures. (2S) McAllister

205. Weeds. Recent advances in methods of weed control. Two lectures. (2W) Tingey


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

Soils

56. Introductory Soils. Fundamentals of soils with a brief study of soil fertility and management problems. A beginning course for students in agriculture. Prerequisite: Inorganic Chem. Three lectures, one 3-hr. lab. (4F, W or S) Staff

57. Introductory Soils Laboratory. Offers credit for the laboratory of Agronomy 56 for students who have had a general soils course without a laboratory. One credit. Given the same as Agron. 56 laboratories. 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 Chem. (Credit not given for both 56 and 58.) Four lectures, one 3-hr. lab. (5S) Staff

107. Fertility and Management of Irrigated Soils. Methods and amounts of irrigation water application in relation to soils and crops. Fertilizer
selection and use in relation to irrigation and soil management. The management and reclamation of saline soils. Organic matter maintenance in soils. Prerequisite: Agron. 56. Five lectures. (5F or W) Peterson; Smith

110. Soil Microbiology. See Bacteriology 110.

114. Soil Conservation and Survey. Principles and techniques of soil survey and conservation and land classification. Problems of land policy and management and field practice in farm planning. Prerequisite: Agron. 56, and 3 credits in field crop production or range management. Two lectures, 3 lab periods. (6S) Wilson

155. Soil and Plant Relations. Plant and soil relations with respect to physical environment and the availability and absorption of minerals. Laboratory in soil and plant analysis in relation to soil productivity. Prerequisite: Agron. 56. Two lectures, one 3-hr. lab. period. (3W) Peterson

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

212. Seminar. Review of current literature in soil science. Required of graduate students in soil science; open to staff members. One credit per quarter, on conference. (1F, W, S) 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. Prerequisites: Agronomy 165 and approval of the instructor. Three lectures. (3W) Taylor

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

220. Range and Forest Soil Problems. Special soil problems associated with soils used for forest or range. Prerequisite: Agron. 58, 155, 165. 2 cr. Time arranged. Pittman

221. Genesis, Morphology and Classification of Soils. A critical review of basic principles of soil classification, soil forming factors in relation to generic, morphological and zonal distribution of soils. Prerequisite: Agron. 114 or permission of instructor. Three lectures. (3S) Staff

224. Soil Chemistry. Composition and reactions of soil colloids. Prerequisite: Approval of instructor. (3S) Smith

227. Chemical Analysis of Soils. A laboratory course in soil chemistry. Two lab. periods. Prerequisite: Agron. 155 and 224, or approval of instructor. (2S) Peterson

266. Physical Analysis of Soils. A laboratory course in Soil Physics. Registration limited to twelve students. Two 3-hour lab. periods. Prerequisite: Agron. 165. (2W) Taylor

Special Courses


116. Dry Farming. Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the mountain regions; and analysis of the possibilities in typical climatic areas, and on important soil types. Prerequisites: Agron. 7 and 56. Two lectures. (2S)
117. Geography of Agriculture. A brief review of the principal agricultural regions of the world, with topography, climate, soils, livestock, population and industries considered in relation to agriculture. Two lectures. (2W)

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

218. Special Problems. Special problems in crop production, crop breeding, soil fertility or other phases of agronomic work. Students review literature on the problem and conduct experiments. Any quarter. Time and credit arranged. Staff

230. Research and Thesis. Outlining and conducting research in soils or farm crops and preparation of thesis. Any quarter. One or more credits each quarter. Staff

Applied Statistics

Rex L. Hurst, Associate Professor and Head.

The Department of Applied Statistics offers service courses in statistical methodology to all departments of the college.

75. IBM Machine Operation. Card design and coding methods. Basic operation of the key punch, verifier, sorter, interpreter, reproducing punch, collator and accounting machine. Two lectures, one lab. (3F) Staff

76. IBM Machine Operation. Wiring and operation of reproducing punch, collator, accounting machine and calculating punch. Job planning. Prerequisite: Applied Statistics 75. Two lectures, one lab. (3W) Staff


141. Sampling methods. The methods and theory of obtaining sample estimates of population characteristics. Reliability of sample estimates. Types of sampling procedures. Analysis and interpretation of samples. Prerequisite: an elementary course in statistics. Two lectures, one 2 hour lab. (3S) Hurst

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

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

Animal Husbandry

J. A. Bennett, Professor and Head of Department; L. E. Harris, G. R. Henderson, Professors; R. H. Keeteh, M. A. Madsen, H. Steffen, Associate Professors; Doyle Matthews, Darrell Matthews, John E. Butcher, Assistant Professors; J. R. Harris, D. O. Williamson, Robert J. Raleigh, Research Associates.

Students majoring in Animal Husbandry are expected to complete 32 credits in this field, including courses numbered 1, 2, 10, 40, 110, 125, 150, 155, 160 and 165.

For students who plan to enter livestock production, county agent work, vocational agricultural teaching or some similar work, a minor in Agricultural Economics, Agronomy, Dairy Husbandry, Poultry Husbandry, or Range Management is recommended.
Graduate study leading toward the Master of Science degree is offered in animal breeding, nutrition, and production. In addition to graduate courses (in the 200 series) courses 150, 151, 155 and 175 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry if the student's supervisory committee approves.

Suggested Course of Study for Majors in Animal Husbandry

### Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>An. Hus. 1 &amp; 2, 40</td>
<td>6</td>
</tr>
<tr>
<td>M. S. or P. E.</td>
<td>3</td>
</tr>
<tr>
<td>Math. 34 or 35</td>
<td>3 or 5</td>
</tr>
<tr>
<td>Bot. 24 or 25</td>
<td>5</td>
</tr>
<tr>
<td>Bact. 10</td>
<td>5</td>
</tr>
<tr>
<td>Agr. Econ. 63</td>
<td>5</td>
</tr>
<tr>
<td>Soc. 10 or 70, or Hist. 14</td>
<td>5</td>
</tr>
<tr>
<td>Eng. 1, 2, 3</td>
<td>9</td>
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<tr>
<td>Vet. Sci. 20</td>
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<tr>
<td>Electives</td>
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### Sophomore

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<td>M. S. or P. E.</td>
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<tr>
<td>Chem. 10, 11, 12 or 3, 4, 5</td>
<td>15</td>
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<tr>
<td>Zool. 3 &amp; 4, or 2</td>
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<td>Hort</td>
<td>3</td>
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<tr>
<td>Agron. 56</td>
<td>4</td>
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<tr>
<td>Language and Arts</td>
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<tr>
<td>Electives</td>
<td>0 or 5</td>
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<td><strong>Total</strong></td>
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### Junior

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<tr>
<td>An. Hus. 110, 120, 125, 165.</td>
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<tr>
<td>Dairy 109 or 110</td>
<td>3 or 5</td>
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<tr>
<td>Agron. 7, 8, or 107</td>
<td>3 or 5</td>
</tr>
<tr>
<td>Agr. Econ. 58, 63</td>
<td>6</td>
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<tr>
<td>Vet. Sci. 120</td>
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<tr>
<td>Zool. 112</td>
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<tr>
<td>Electives</td>
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<td><strong>Total</strong></td>
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### Senior

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<tr>
<td>An. Hus. 150, 155, 160, 175, 185</td>
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<tr>
<td>Agron. Econ. 116 or 162</td>
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<tr>
<td>Range Mgt. 160</td>
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<td>Agron. 103</td>
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<td><strong>Total</strong></td>
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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 or S) Steffen

2. **Animal Husbandry Laboratory.** Exercises in judging, market classification and practical problems. Should be taken at the same time as An. Hus. 1. Two lab. periods. (2F or S) Madsen

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

15. **General Animal Breeding.** For students who do not expect to major in animal science but who want general knowledge of reproduction and breeding principles and their application to larger farm animals. (3W) Madsen

40. **Fitting and Showing Livestock.** Current methods of fitting and training livestock for showing. Each student prepares and exhibits animals in a showing contest. (1F or S) Matthews

110. **Beef Production.** Factors involved in economical production of beef cattle, including organization of the enterprise, breeds of cattle, selection of breeding stock, production of maximum calf crop, handling and feeding animals of different ages on the range and in the feed lot, and marketing of surplus stock. Prerequisite: An. Hus. 10. (3F) Bennett

120. **Swine Production.** Systems of production with emphasis on those suited to western conditions. Breeds, management and feeding of the breeding herd, and feeding for market. Relation of the industry to dairy farming. Prerequisite: An. Hus. 10. (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: An Hus. 10. (3W or S) Matthews; Madsen

150. Animal Nutrition. Attention given fundamental phases, including protein, carbohydrate, fat and mineral metabolism, vitamins, content and deficiencies of range forage, and feed and forage poisoning. Prerequisite: Chem. 10, 11, 12 (or equivalent), and An. Hus. 10 (4W) Harris

151. Nutritional Diseases. Cause, detection, treatment and prevention. Prerequisite: An. Hus. 150, senior standing or special permission of instructor. Taught alternate years. (Taught 1956-57) (3W) Harris

155. Animal Breeding. Application of genetics to improvement of farm animals. Breeding systems, inheritance problems, fertility and sterility in larger farm animals are emphasized. Prerequisite: Vet. Sci. 20, Zool. 112. Four lectures, one lab. (5W) Bennett

160. Livestock Production Problems. Attention is given various problems in livestock production, especially in Utah. Students are expected to apply knowledge acquired in previous courses. Prerequisite: An. Hus. 110 and 125. (3S) Madsen

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

175. Wool Technology. Marketing and manufacturing of wool, and laboratory techniques used in studying wool. Methods of grading, scouring, and measuring length, diameter, crimp, density, tensile strength and other characteristics are included. Prerequisite: A. H. 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. Preparation of meats for the home freezer will be emphasized. (3W) Matthews

201. Problems in Animal Breeding. Readings, discussions and lectures concerning genetic facts and theories as related to animal breeding. Prerequisite: An. Hus. 155. (3W) Bennett

210. Problems in Animal Nutrition. Assignment, discussions and reports. Students review literature of animal nutrition and prepare reviews of assigned topics. Prerequisite: An. Hus. 150. (2-6F, W or S) Harris

215. Nutrition Laboratory. Review and practice in techniques used in nutrition research. Two labs. (2F or W) May be repeated. Harris

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

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

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

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

261, 262, 263. Animal Industry Seminar. Topics of current interest and research problems are presented by graduate students, staff members and guest speakers. Subjects discussed relate to nutrition, breeding, and production during Fall, Winter and Spring, respectively. (May be repeated.) (IF, W, S) Staff
### TECHNICAL ANIMAL HUSBANDRY MAJOR

**Exact Science**
- Math 35, 44, or 46
- Chem. 3, 4, or 10 and 11, 5, 17, 18
- Physics 5, 7, or 17, 18, and 19

**Biological Science**
- Zoo. 3, 4
- Botany 24 or 25
- Bact. 70 and 71
- Zoo. 112

**Social Science**
- Ag. Econ. 53
- Elective in group

**Lang. and Arts**
- Elective in group

**Basic Communications**
- 5

**An. Hus.**
- 10, 110, 125, 150, 155, 160, 165, 175
- 29

**Other Animal Sc.**
- Vet. Sc. 20
- Dairy 109 or 110 or Poult. 1
- 3 or 5

**Plant Sc.**
- Agronomy 6, 108, 56
- 8

**Electives**
- 32 to 45
- 138 to 151

### Botany and Plant Pathology

Ralph W. Ames, Professor and Head of Department; W. S. Boyle, George W. Cochran, Professors; Herman H. Wiebe, Associate Professor; Arthur H. Holmgren, Associate Professor and Curator of the Intermountain Herbarium; Richard J. Shaw, Assistant Professor; John L. Chidester, Research Associate; Orson S. Cannon, Eugene H. Cronin, Leonard L. Jansen, George H. Kaloostian, Bryce N. Wadley, Robert Zundel, Collaborators, U. S. Department of Agriculture.

### Bachelor of Science Degree in Botany

Study and research in Botany focus upon four major fields of study: cytology, pathology, physiology, and taxonomy. Course requirements for all fields of botany include: Botany 24, 25, 30, 117, 120, 240, 241, 242; Math 35; Chem. 10, 11, 12; Zoo. 112. Required additional courses for the various fields of botany are as follows: Cytology: Botany 116, 118, 130 or 150; Zoo. 3, 4, 131; Chem. 124, 125; Physics 6, 7; Pathology: Botany 116, 130, 150; Zoo. 2; Ent. 108; Physiology: Botany 130 or 150; Zoo. 3, 4; Taxonomy: Botany 116, 118, 130, 150; Zoo. 107, 131, 214; Agronomy 56; Range Management 126; German 1, 2, 3; Latin 1, 2, 3.

Recommended additional courses for specialized fields include: Cytology: Botany 130 or 150; Math. 44, 97, 98, 99; Pathology: Botany 221, 222, 223; Ent. 230; Math. 44, 97, 98, 99; Chem. 124, 125; Physics 6, 7; Ag. Econ. 53; Bact. 70; Agronomy 56, 131, 132; Hort. 131, 1, 4, 6; Physiology: Botany 116, 130 or 150, 224; Math. 44, 97, 98, 99; Chem. 124, 125, 115; Physics 20, 21, 22; Bact. 180; Agronomy 56, 131, 132; Taxonomy: Agronomy 131, 132; Botany 104, 108, 112.

Course requirements for a teaching major: Botany 24, 25, 30, 120, 180.
Master of Science Degree in Botany

The Department of Botany offers opportunity for research and graduate study leading to the Master of Science degree in the following specialized fields: Cytology, Pathology, Physiology, Taxonomy. The research and graduate possibilities in these subjects are greatly augmented through the cooperation of the Utah Agricultural Experiment Station, United States Department of Agriculture, and the Intermountain Herbarium.

1. Principles of Biology. Basic life principles illustrated in both plant and animal forms. For lower division students except those who may elect Bot. 24, 25 or Zool. 2, 3, and 5. (5F, W, S)  
   Shaw

   Holmgren

24. Elementary Botany. The structure, physiology and reproduction of flowering plants. Consideration given basic structure and functions of cells, tissues, stems, roots, leaves, flowers, fruits, and seeds. Three lectures, two laboratory periods. (5F, or S)  
   Boyle; Shaw

25. Elementary Botany. A survey of the plant kingdom. Emphasis on comparative morphology and reproduction processes of representatives of the major groups of plants. Introduction to the classification of vascular plants is given toward the end. Three lectures, two labs. (5W, Su)  
   Boyle; Shaw

30. Taxonomy of Vascular Plants. The kinds, relationships, and classifications of vascular plants, chiefly of this region. Assumes a knowledge of fundamental principles of botany. Two lectures, two labs. (5S)  
   Holmgren

104. Taxonomy of Poisonous Plants. The kinds, relationships, and classifications of poisonous plants, chiefly of this region. Assumes a knowledge of fundamental principles of botany. (2W)  
   Holmgren

108. Agrostology. A taxonomic study of native and imported grasses of the western ranges. Special attention to species important in grazing and soil binding. Assumes a knowledge of fundamental principles of botany. (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. (3F)  
   Holmgren

   Boyle

   Boyle

118. Cytology. A detailed study of the cell; emphasizes structure and behavior of chromosomes and their bearing on genetics, reproduction, and evolution. Assumes a knowledge of fundamental principles of botany or zoology. (4S)  
   Boyle

120. Elementary Plant Physiology. Principles of absorption, mineral nutrition, food manufacture, metabolism, translocation, and growth. Assumes a knowledge of fundamental principles of botany. Prerequisites: Chem. 12 or 121. (5W or S)  
   Wiebe
121. Water Relations of Plants. Consideration of rooting habits, sap concentration, transpiration and water requirements of plants. Prerequisite: Bot. 120. (3S) Taught alternate years. Offered in 1956-57.

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. Prerequisite: Bot. 24. (5F) Ames


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: Bot. 25. (5W) Taught alternate years. Not offered in 1956-57.

221, 222, 223. Pathological and Physiological Techniques. Special methods applied to plant pathology, physiology, and related subjects. Registration only by special permission. (2F, W, S) Taught alternate years. Not offered 1956-57. Staff

224. Advanced Plant Physiology. Chemical reactions and transformations underlying the vital processes in plants. Prerequisite: Bot. 120. (3S) Not offered 1956-57. Wiebe

234. Special Problems. Open to qualified students majoring in pathology, taxonomy, plant physiology, or cytology. Any quarter. Time and credit arranged.

240. Seminar. (1F, W, S)

250. Research. Open to all qualified college students in botany and plant pathology. Any quarter. Time and credit arranged.

Dairy Industry

A. J. Morris, Professor and Head of Department; G. Q. Bateman, P. B. Larsen, L. R. Hunsaker, G. E. Stoddard, Associate Professors; L. R. Rich, Associate Professor and Extension Dairyman.

G. B. Caine, Professor Emeritus.

There is demand in the field of dairying for students who have had advanced training. Opportunity is offered to pursue graduate study with applications in chemistry, biochemistry, genetics, bacteriology, or economics.

All majors in Dairy Industry must have practical experience on a dairy farm or in a dairy manufacturing plant before graduation.

General Course in Dairy Production

Designed for students majoring in Dairy Production to prepare them for the management and operation of dairy farms and herds; and to become county agricultural agents or field men in the Dairy Industry.

Students must fill the general requirements of the college and the School of Agriculture and in doing so must take Zoology 2 and Botany 24 in filling the Biological Science group. The following courses are also required. Dairy 1, 6, 12, 109, 110, 111, 112, 215, 120 and 121; Bacteriology 10 or 70 and 104; Veterinary Science 20 and 120; Animal Husbandry 10 and 155; Mathematics 34; Political Science 102 and Library Science 106; Zoology 112, Agron. 6, 7, 56 and 108.
Technical Course in Dairy Production

Designed for students majoring in Dairy Production to prepare them for technical employment in the field of Dairy Production and for advanced study and research in this field.

In filling the general requirements of the college dairy students must take Zoology 2 and Botany 24. The following courses must also be taken. Dairy 1, 6, 12, 109, 110, 111, 112, 215, 120 and 121. Bacteriology 70, 71 and 104, Veterinary Science 20 and 120; Animal Husbandry 10, 150 and 155; Chemistry 3, 4, 5, 125, 126, 190 and 108; Mathematics 34 and 35; Agronomy 6, 7, 56 and 103; Agricultural Economics 53, 58 and 63; Zoology 112; Library Science 106 and Political Science 102.

General Course in Dairy Manufacturing

This course prepares students of commercial dairying to be plant operators, equipment and supply technicians, inspectors, graders, and sanitarians.

In addition to the general college requirements students in general Dairy Manufacturing should take: Chem. 10, 11, 12, 190 and 108; Math. 34; Ag. Econ. 53, 62, and 115; Land Arch. 3; Poultry 1 and 2; Bacteriology 104 and 105; Business Administration 20 and 63; Agr. Engineering 4; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 215, 254.

Business Course in Dairy Manufacturing—Plant Management

This course prepares students for plant managers, salesmen and dairy industry administrators.

In addition to the general college requirements students in the business course in Dairy Plant Management must take: Chemistry 10, 11, 12, 190 and 108; Ag. Econ. 53, 62 and 115; Bacteriology 104 and 105; B. A. 20, 63, 154, 156, and 160. Engineering 4; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 215 and 254.

Technical Course in Dairy Manufacturing in Preparation for Research and Quality Control

In addition to the general college requirements students in the technical course in Dairy Manufacturing Research and Quality Control should take: Chem. 3, 4, 5, 17, 18, 121, 122, 190, 108; Bact. 104, 105, 160 and 180; Appl. Stat. 131; Library Science 106; Physics 6; Math. 35 and 44; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 121, 215 and 254.

All dairy students must take 3 or more quarters of DI 215.

2. Introductory Dairying—Considers the history and development 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; and dairy arithmetic will be studied. Practical skills will be emphasized. (5 F & S) Morris and Caine

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

6. Market Milk. Modern sanitary methods of producing, processing, and marketing milk, cream, and related products for city supply. (5F) Larsen

7. Dairy Practice. For special or short course students only. Practice in plant manufacture emphasized. Any quarter. Time and credit arranged. Larsen
12. Breeds of Dairy Cattle. History and development of all breeds of dairy cattle; emphasis on the various families within breeds; requirements for official testing; pedigree and herd book study. (3F) Caine

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 creams, sherbets, and ices. Merchandising and selling included. (5S) Caine


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

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

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 or S) Caine


110. Dairy Production. A brief review of dairy cattle breeding, calf feeding and management, developing dairy heifers, factors influencing the growth and development of dairy cattle, the care and management of dairy herds. Special emphasis on feeding for milk production. A thorough study of housing dairy cattle. (5S) Caine

111. Dairy Cattle Judging. The types of various breeds of dairy cattle. Visits to important herds. Valuation of dairy cattle. (2S) Caine

112. Feeding Dairy Cattle. Metabolism and the characteristics of feeds and feeding standards. Emphasizes practices under irrigation farming. (3S) Caine

120. Dairy Cattle Breeding. Studies of the inherited characteristics of dairy cattle to be considered in selecting breeding stock. Artificial insemination of dairy cattle, physiology of reproduction, and breeding programs and systems in use. (3W) Caine

121. Milk Secretion. A brief review of the mammary gland. Theories of milk secretion and study of some problems related to management, including mastitis control, flavors in milk. (3W) Caine

215. Seminar. Discussion and reports of current literature. Any quarter. Time arranged. Staff

220. Res. in Dairy Industry. Any quarter. Time and credit arranged. Staff

254. Special Problems in Dairy Industry. Any quarter. Time and credit arranged. Staff
Horticulture

Leonard H. Pollard, Professor and Head of Department; Anson B. Call, Associate Professor and Extension Fruit Specialist; Alvin R. Hamson, Associate Professor; Robert K. Gerber, Paul Krumperman, Robert A. Norton, and Dattajeeroo K. Salunkhe, Assistant Professors; Otto Riethmann, Instructor; *Odeal Kirk, Superintendent, Max Williams, Acting Superintendent, Howell Field Station; Rulon Draper, Superintendent, Farmington Field Station; Leslie R. Hawthorn, Collaborator in Research, USDA.

Students may pursue a course in general Horticulture, or they may specialize in Pomology, Floriculture or Vegetable Crops. All students majoring in Horticulture are required to take the same basic course during the first two years. Suggested special courses are outlined for the Junior and Senior years.

Master of Science Degree

The department offers work towards a Master of Science degree in Horticulture. A year’s study in this department is accepted by other colleges and universities as a year toward a Ph.D. degree in the field of study pursued. The outline of studies and the research program are designed around the objective of the individual student.

All courses in horticulture numbered above 100 may be used for graduate credit.

Horticulture 1, 2, 4 and 5 may be counted to fill the horticultural requirement for students in the various fields of agriculture.

Lower Division Courses in Horticulture

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Sophomore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 34 and 35</td>
<td>Chem. 10, 11, 12, or 3, 4, 5</td>
</tr>
<tr>
<td>P. E. or M. S. &amp; T.</td>
<td>Math. 46</td>
</tr>
<tr>
<td>Botany 24 &amp; 25</td>
<td>Agron. 56</td>
</tr>
<tr>
<td>Agr. Econ. 63</td>
<td>Animal Science</td>
</tr>
<tr>
<td>Hort. 1</td>
<td>Landscape Arch.</td>
</tr>
<tr>
<td>Hort. 2</td>
<td>P. E. or M. S. &amp; T.</td>
</tr>
<tr>
<td>Hort. 4</td>
<td>Hort. 10 or 11</td>
</tr>
<tr>
<td>Hort. 5</td>
<td>Social Science</td>
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<tr>
<td>Animal Science</td>
<td>Ag. Econ. 58 &amp; 63</td>
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<tr>
<td>Social Science</td>
<td>Bact. 10 or 70 &amp; 71</td>
</tr>
<tr>
<td>Botany 30</td>
<td></td>
</tr>
<tr>
<td>Basic Communication</td>
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</table>

50-52

50-51

Suggested Courses for Students in General Horticulture

<table>
<thead>
<tr>
<th>Junior</th>
<th>Senior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hort. 108</td>
<td>Hort. 105 or 151</td>
</tr>
<tr>
<td>Hort. 101, 102</td>
<td>Hort. 131</td>
</tr>
<tr>
<td>Ent. 108</td>
<td>Hort. 152</td>
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<tr>
<td>Botany 120</td>
<td>Hort. 153</td>
</tr>
<tr>
<td>Zoology 112</td>
<td>Hort. 124</td>
</tr>
<tr>
<td>English 110</td>
<td>Hort. 115</td>
</tr>
<tr>
<td>Botany 130</td>
<td>Electives</td>
</tr>
<tr>
<td>Entomology 120</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td></td>
</tr>
</tbody>
</table>

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*On Leave.
### Suggested Course for Students Specializing in Floriculture

<table>
<thead>
<tr>
<th>Junior</th>
<th>Cr.</th>
<th>Senior</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hort. 116</td>
<td>3</td>
<td>Hort. 119</td>
<td>3</td>
</tr>
<tr>
<td>Entomology 108</td>
<td>5</td>
<td>Hort. 120</td>
<td>3</td>
</tr>
<tr>
<td>Hort. 118</td>
<td>3</td>
<td>Hort. 153</td>
<td>3</td>
</tr>
<tr>
<td>Botany 120</td>
<td>5</td>
<td>Hort. 130</td>
<td>4</td>
</tr>
<tr>
<td>Hort. 117</td>
<td>3</td>
<td>Chem. 121, 122</td>
<td>10</td>
</tr>
<tr>
<td>Zoology 112</td>
<td>5</td>
<td>Hort. 115</td>
<td>4</td>
</tr>
<tr>
<td>Botany 120</td>
<td>5</td>
<td>Electives</td>
<td>24</td>
</tr>
<tr>
<td>Entomology 120</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 110</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape Arch. 40</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape Arch. 41</td>
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<tr>
<td>Electives</td>
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<td></td>
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</tbody>
</table>

### Suggested Course for Students Specializing in Vegetable Crops

<table>
<thead>
<tr>
<th>Junior</th>
<th>Cr.</th>
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<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>Agron. 107</td>
<td>5</td>
<td>Agronomy 109</td>
<td>4</td>
</tr>
<tr>
<td>Zoology 112</td>
<td>5</td>
<td>Applied Statistics 131 &amp; 132</td>
<td>6</td>
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<tr>
<td>Eng. 110</td>
<td>4</td>
<td>Agronomy 155</td>
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</tr>
<tr>
<td>Hort. 130</td>
<td>4</td>
<td>Hort. 124</td>
<td>4</td>
</tr>
<tr>
<td>Hort. 105</td>
<td>4</td>
<td>Hort. 121</td>
<td>4</td>
</tr>
<tr>
<td>Hort. 108</td>
<td>3</td>
<td>Hort. 131</td>
<td>5</td>
</tr>
<tr>
<td>Botany 120</td>
<td>5</td>
<td>Hort. 153</td>
<td>3</td>
</tr>
<tr>
<td>Chem 121, 122</td>
<td>10</td>
<td>Botany 121</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>11</td>
<td>Botany 130</td>
<td>5</td>
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<tr>
<td></td>
<td></td>
<td>Entomology 108</td>
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<td></td>
<td></td>
<td>Electives</td>
<td>5</td>
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</tbody>
</table>

### Suggested Course for Students Specializing in Pomology

<table>
<thead>
<tr>
<th>Junior</th>
<th>Cr.</th>
<th>Senior</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hort. 108</td>
<td>3</td>
<td>Hort. 152</td>
<td>4</td>
</tr>
<tr>
<td>Entomology 108</td>
<td>5</td>
<td>Hort. 151</td>
<td>4</td>
</tr>
<tr>
<td>Hort. 101, 102</td>
<td>8</td>
<td>Hort. 153</td>
<td>3</td>
</tr>
<tr>
<td>Botany 120</td>
<td>5</td>
<td>Chem. 121 &amp; 122</td>
<td>10</td>
</tr>
<tr>
<td>Zoology 112</td>
<td>5</td>
<td>Hort. 131</td>
<td>5</td>
</tr>
<tr>
<td>Botany 130</td>
<td>5</td>
<td>Hort. 115 or 124</td>
<td>4</td>
</tr>
<tr>
<td>English 110</td>
<td>4</td>
<td>Electives</td>
<td>21</td>
</tr>
<tr>
<td>Entomology 120</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>Electives</td>
<td>14</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>51</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Technical Course in Horticulture

Students with special aptitude and high scholastic standing may enroll in a course in technical horticulture which is designed to prepare them for graduate work and for technical employment. Students interested in such a course should contact the head of the department.

In addition to the college group requirements, students in the technical course must take Math. 34, 35, & 46; Chem. 3, 4, 5, 121 & 122 or 125 & 126, 190 or 191; Bot. 24, 25, 30, 120, 130; Bact. 70 & 71; Agron. 56, 107, 131 & 132; Zool. 112; Ent. 108; Hort. 1, 2, 4, 5, 6 or 10; Eng. 111.
1. Elementary Pomology. Principles and practices underlying production of tree and small fruits. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage, propagation, and stocks. (3F, W) Norton; Gerber

2. Elementary Pomology Laboratory. A laboratory course to accompany or follow Hort. 1. A prerequisite for advanced Pomology courses. Practical experience in the various operations of pomological work. (IF, W) Norton; Gerber

3. Vegetable Production. Methods of production, harvesting, storage and processing of vegetables. (3F, or S) Hamson; Pollard

4. Vegetable Production Laboratory. A laboratory course to accompany or follow Hort. 1. A prerequisite for advanced Pomology courses. Practical experience in the various operations of pomological work. (IF, W) Norton; Gerber


7. Pruning and Grafting. A practical course for all students in the college 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. Six lectures, 24 hours of arranged lab work and at least 10 hours of practical experience in the field required. (2W) Norton

8. Advanced Pomology. Principles and practices of orcharding; 101, water relations, nutrition, light, growth regulators; 102, temperature, pruning, fruit setting. Prerequisite: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 and 2. (4F, 4W) Taught alternate years. (Given 1956-57) Gerber

9. Small Fruit Production. The culture of small fruit in home and commercial plantings. Prerequisite: Hort. 1 (SW) (Taught 1957-58) Norton

10. Fruit and Flower Breeding. Fundamental principles and practices of plant breeding in the improvement of fruit and ornamental plants. Prerequisites: Zool. 112; Hort. 1 and preferably 6, 10, and 108. (4S) Taught in alternate years. (Taught 1957-58) Pollard

11. Commercial Greenhouse Management. Principles and practices of commercial greenhouse management. Prerequisites: Hort. 1, 6, 10; Bot. 24, 25. (3F, 3W) Taught in alternate years. (Taught 1956-57) Riethmann

12. Floral Design. Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. (3F) Taught in alternate years. (1957-58) Staff

13. Systematic Floriculture. 119. Systematic study of garden flowers. Prerequisites: Hort. 1, 6, 10; Bot. 30. 120. Systematic study of plants grown by florists. (3F, 3W) (Taught 1956-57) Staff

14. Advanced Vegetable Crops. Economic, ecological and physiological factors underlying vegetable production, based on study of experimental results. Prerequisites: Hort. 4; Agron. 56; Bot. 120. (4W) Taught in alternate years. (Taught 1957-58) Ballard


16. Vegetable and Flower Seed Production. Methods and commercial possibilities of vegetable and flower seed production in Utah. A required field trip is taken into seed producing areas in southern Idaho. (4F) Taught in alternate years. (Taught 1956-57) Pollard; Hawthorn
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 application equipment. Two laboratory periods a week. Jointly administered by the Departments of Botany and Plant Pathology, Horticulture, and Zoology, Entomology, and Physiology. Prerequisites: Bot. 130, Ent. 108, or special permission. (5S) Ames; Davis; Norton


152. Fruit Handling. Problems in handling and marketing; picking, grading, packing, transportation, storage, distribution, buildings, equipment, roadside and local marketing, processing. One laboratory period per week. Prerequisite: Hort. 1. (4F) Taught alternate years. (Taught 1957-58) Gerber

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

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

201. Research and Thesis. Original research by graduate students taking a major or minor in horticulture. Registration by permission only. One to ten credits. 201, Fall; 202, Winter; 203, Spring; 204, First Summer Term; 205, Second Summer Term. Staff

206. Graduate Conference and Problems. (Variable credit F, W, S) Staff

215. Special Problems. Any quarter. Time and credit arranged. Staff

220. Advanced Vegetable Breeding. A study of special techniques and practices used in vegetable breeding. Prerequisites: Vegetable Crops 124. (3 arr.) Pollard

221. Advanced Vegetable Problems. A study of current research as related to important vegetable problems. Prerequisites: Hort. 4, 105; Agronomy 56; Botany 120. (4W) Hamson

Poultry Husbandry

C. I. Draper, Professor and Head of Department; J. O. Anderson, J. D. Carson, Associate Professors; Elmer Clark, Assistant Extension Specialist; D. D. Thomas, Associate Poultry and Livestock Specialist.

Courses in other departments that can be applied toward a major in Poultry Husbandry are: Animal Husbandry 150, 151, and 155; and Veterinary Science 120 and 170, Agricultural Economics 115.

The department offers courses leading to the Master of Science degree in Poultry Husbandry.

SUGGESTED COURSE OF STUDY FOR MAJORS IN POULTRY HUSBANDRY

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>Credit</td>
</tr>
<tr>
<td>Physiol.</td>
<td>5</td>
</tr>
<tr>
<td>P. H. 1</td>
<td>3</td>
</tr>
<tr>
<td>Math. 34 or 35</td>
<td>3 or 5</td>
</tr>
<tr>
<td>M. S. or P. E.</td>
<td>3</td>
</tr>
<tr>
<td>Agr. Econ. 58</td>
<td>5</td>
</tr>
<tr>
<td>Bact. 10</td>
<td>5</td>
</tr>
<tr>
<td>Vet. Sci. 20</td>
<td>5</td>
</tr>
<tr>
<td>Hort. 1</td>
<td>3</td>
</tr>
<tr>
<td>A. H. 1</td>
<td>3</td>
</tr>
<tr>
<td>Eng. 1, 2, 3</td>
<td>9</td>
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<tr>
<td>Rural Soc. 10</td>
<td>5</td>
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<tr>
<td>Elective</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>53</strong></td>
</tr>
</tbody>
</table>
Sophomore Year

Veg. Crops  3
Chem. 3, 4, & 5 or 10, 11, 12  15
P. H. 8  3
Agron. 6 & 7 or 8 & 56  8
M. S. or F. E.  3
Soc. Sci.  3
Zool. 2  5
L. A. 3  3
Electives  7

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Senior Year

An. Hus. 150  4
Physiol. 121  5
Entom. 108  5
P. H. 125, 126, 105 or 106  6
D. H. 109  3
Agr. Engr. 105  5
Electives  21

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Suggested Electives: Irr. and Dr. 10; Vet. Sci. 140, 151, 155; Agron. 131, 132; Chemistry 125, 126, 190; English 5, 111.

1. General Poultry. A study of breeds, judging, incubation, brooding, feeding, marketing, and problems of production. (3W or S) Draper

2. General Poultry Laboratory. Covers the same work as Poultry 1, with practical laboratory problems. (1W or S) Staff

8. Turkey Production. A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small farm flock or large commercial flock management are emphasized. (3F) Taught alternate years. (Taught 1957-58) Carson

104. Incubation. Problems involved in incubation, embryology, and hatchery operations. Two lectures and one lab. Lab. arr. (3S) Taught alternate years. (Taught 1956-57) Carson

105. Poultry Management. Problems of location of poultry farm, farm planning, renewing the flock, brooding, marketing and problems affecting labor income. Prerequisite: Poultry 1 (3W) Taught alternate years. (Taught 1956-57) Carson

106. Poultry Breeding. Discussed from the standpoint of populations rather than individuals. Consideration is given to selection pressure, relationships, inbreeding, heritability, expected gains, mating systems, and selection indexes. Prerequisites: Poul. 1, Math. 34, and Zool. 112. (3W) Taught alternate years. (Taught 1957-58) Carson

107. Poultry Feeds and Feeding. A study of the nutritive requirements of poultry, the composition of poultry feedstuffs, methods of feeding and formulation of rations for special needs. Prerequisite: Poultry 1. Three lectures, one lab. (4W) Taught alternate years. (Taught 1957-58) Anderson

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

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

Poultry Diseases. (See Veterinary Science 170.)

210. Research Problems in Poultry Husbandry. (F-W-S) Time and credit arranged. Staff
SCHOOL OF AGRICULTURE  

Veterinary Science

Merthyr L. Miner, Professor and Head of Department; LeGrande Shupe, Associate Professor; Royal A. Bagley, J. Alan Thomas, Joseph L. Thorne, Wendell Brooksby, Assistant Professors. Don Thomas, Extension Veterinarian; Wayne Binns, Collaborator in Research, U. S. D. A.

Courses in this department are designed not for training students to become veterinarians, but to give them a basic understanding of anatomy and physiology of domestic animals, and the principles of animal sanitation related to disease control. Students wishing a course in Veterinary Medicine should take the proposed pre-veterinary course and then enter a school of Veterinary Medicine for a degree.

Students desiring to study toward a degree in Veterinary Medicine (D.V.M.) must have at least two years and preferably three of pre-veterinary training at some authorized college or university, with all the basic courses completed. Enrollment in veterinary schools is limited; generally, preference is given to the students from the state in which the school is located. Therefore, it is advisable to have a solid and well-rounded background. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry are eligible for entrance into all veterinary schools if the requirements in the basic sciences are fulfilled.

The state of Utah has entered into a compact with the Western Interstate Commission of Higher Education whereby Utah will subsidize the training of five students in the veterinary schools operating under the compact. Utah residents completing the pre-veterinary requirements must apply to the Utah Commission for certification. Student acceptance is dependent on choice of student by the veterinary schools.

A suggested three-year pre-veterinary course has been drawn up. Any student wishing to take this course and who fulfills the college group requirements with a minimum of 141 credits, can, after one year at an accredited veterinary school, obtain a Bachelor of Science degree from this institution. It requires four school years to complete the requirements for graduation from a veterinary school.

20. Anatomy and Physiology of Domestic Animals. A study of how the animal’s body is constructed and its functions. Each system is studied separately; emphasis on the digestive and reproductive systems. 4 lectures, 1 lab. (6F or W) Shupe and Bagley

50. Artificial Insemination of Cattle. Outlined for training students in artificial insemination of cattle and to train technicians for doing insemination in the Artificial Breeding Associations in the State. Fulfills the requirements for the qualifications necessary for the student to be eligible to take the State Board Examination. Two-week short course. (3Su) Miner, Shupe and Thorne

120. Animal 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. 3 lectures, 1 lab. (4S) Thorne

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. 4 lectures, 1 lab. (5F) Miner

170. Poultry Hygiene. Principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of common diseases affecting poultry in this region. Taught alternate years. 2 lectures, 1 lab. (3S) Bagley
200. **Special Problems.** Open to upper division or graduate students majoring in some subject related to Veterinary Medicine and who wish to study a particular phase of disease in animals. Any quarter. Time arranged. Credit 1 to 3.


**Suggested Pre-Veterinary Courses**

The following courses are recommended for pre-veterinary training; those marked (*) are basic pre-veterinary requirements for all schools of veterinary medicine.

*Zoology 3, 4, 112, 118; *Chemistry 3, 4, 5, or 10, 11, 5; *Organic Chemistry 121, 122; *Physics 20, 21, 22, or 6, 7; *Mathematics 34, 35 and 46; *Botany 24; Animal Husbandry 1, 10, 150; Poultry 1, 2; Dairy 1; and *Basic Communications 1, 2, 3.

It is also required that 20 to 30 hours be taken in the language and arts and social science groups to meet the requirements of the veterinary schools where the individual expects to make application.
SCHOOL OF BUSINESS AND SOCIAL SCIENCES

M. R. MERRILL, Dean

Business Administration ................................................................. 106
Accounting .................................................................................. 108
Business Management ................................................................. 109
Business and Distributive Education ........................................... 111
Merchandising ............................................................................ 111
Economics .................................................................................... 112
History and Political Science ...................................................... 115
Pre-Legal Training ....................................................................... 119
Secretarial Science ........................................................................ 119
Social Science ............................................................................. 122
Sociology and Social Work ............................................................ 122-125
General Information

The School of Business and Social Sciences gives opportunity for a liberal education with special emphasis upon the business, social, and political phases of life. The School comprises two major areas—business, and the social sciences. Graduates are prepared to assume leadership and responsibility in business and they will have the basic elements for further training in the professions. Students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Business Education, Economics, History, Political Science, Pre-law, Sociology, and Social Work.

For the profession of law, the programs offered in Economics, History, and Political Science afford excellent preparation. Graduates who have met the necessary requirements are prepared for positions as secondary school teachers. Many desirable positions as industrial managers are open to those who are qualified by training and experience. Many students find employment in retail and wholesale merchandising.

Special attention is called to the many opportunities for service in social work and government. The departments of Political Science and Sociology offer basic and professional courses in these fields.

Business Administration

V. D. Gardner, Professor; Ina Doty, Norman S. Cannon, Associate Professors; Floris S. Olsen, Stanford L. Johnson, William V. Tezak, Assistant Professors; Helen Lundstrom, Instructor.

Students majoring in Business Administration may concentrate in Accounting, Management, Merchandising, Secretarial Science, and Distributive Education. Students are advised to select from courses listed below to complete their major and technical subjects. (Students majoring in Secretarial Science should register under the advice of the instructional staff for Secretarial Science.)

Credit Toward Master of Science Degree

With approval of heads of related departments in which students are candidates for the Master of Science degree, courses numbered 101 or above in the Department of Business Administration and Secretarial Science are acceptable for graduate credit.

RECOMMENDED COURSES

In conformance with group requirements, as discussed on page 51, students in business administration are urged to secure as broad a cultural background as possible in the first two years of their work toward a degree. To that end the following courses are favored by the department:

FRESHMAN AND SOPHOMORE YEARS, GENERAL EDUCATION BACKGROUND

Physical Education and Military Science

Biological Science Requirements: Biology 1, Physiology 4.

Exact Science Requirements: Chemistry 1, 2; Geology 42; Math. 34, 35, 60; Physical Science 31, 32, 33.
Language Arts Requirements: Art 3, 26; English 40; Landscape Architecture and Planning 3; Music 1, 80, 81.

Social Science Requirements: Economics 27, 51 and 52; History 4, 5, 10; Political Science 1, 10; Psychology 53; Sociology 70.

Communications Requirements: Basic communications (Freshmen).

Departmental Foundational Work: Ag. Econ. 62; Eng. Drawing 59; B.A. 1 and 2, 20, 29, 30; Political Science, 11, 12, 13; Secretarial Science 41, 42, 65, 92.

JUNIOR AND SENIOR YEARS CONCENTRATIONS


Business Education: (In addition to courses listed as departmental Foundational Work B.A. 29, 30 will be taken in freshman and sophomore years.) 131, 132, 133, 134, 135, 149, 151, 152, 153, 156, 157, 161, 162, 163, Economics 107, 108; Education 111, 113, 114, 116, or 141, 127, 129, 130; Bacteriology 155; Psychology 155, 161; Secretarial Science 179; English 110.

Distributive Education: Same as for general business education eliminating B.A. 29, 30, 133, 134, 135, 149, 150, 156, and Education 111 and Secretarial Science 179 and adding B.A. 63, 156, 194, 195; English 110.

Management: Tool Engineering 51, 52, 58; B.A. 131, 132, 133, 134, 135, 111, 136, 137, 138, 141, 149, 150, 151, 152, 153, 159; Economics 165, 171, 174; 125, 126, 127; Psychology 155; Industrial Education 117, 118, 120; English 110.

Merchandising: (Add B.A. 63 to departmental foundational work) B.A. 131, 132, 149, 150, 151, 152, 153, 154, 155, 156, 157, 160, 161, 162, 163; 164; English 110.

Secretarial Science: (See discussion in that section of catalog.)

Since some of the above courses are taught only in alternate years, the student is not required to take the courses in the year indicated. However, the general outline should be followed whenever possible.

Special Offerings for Mature Persons Who Are Not Candidates for Degrees

For capable, mature persons whose education has been interrupted by war or other causes and who want maximum professional training in a minimum of time, two two-year courses in addition to the one in Secretarial Science have been organized in the School of Business. These courses minimize liberal course offerings and concentrate upon vocational and professional courses. One gives training in merchandising and the other in accounting. Only students who know definitely that they will not seek a degree should pursue these courses, and then only after consultation with the head of the department. Recent high school graduates should not take these programs. A special course in problems of small business is included. A DIPLOMA CERTIFYING COMPLETION WILL BE GIVEN.
ACCOUNTING

1, 2. Introductory Accounting. Lectures, questions, problems and practice sets that require application of the theory advanced. Principles and techniques learned here are basic to further study of accounting and to understanding the common problems of business. Technique emphasized. (B. A. 1-5F or W) (B. A. 2-5W or S) Staff

Burroughs Calculator. (See Secretarial Science 94.)
Commercial and Bank Posting. (See Secretarial Science 98.)
Mathematics of Investment. (See Math 60.)

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. (4F, W, S)


109. Accounting for Non-Commercial Students. For Engineering, Agriculture, Home and Family Living, Forestry, and other non-commercial students (4F and S 1956-57) Gardner; Cannon


121, 122. Auditing Theory and Practice. Principles and procedures presented to give practical knowledge of auditing. Prerequisite: A good working knowledge of accounting principles and techniques. (3F, 3S) Staff

126. Accounting Seminar. (1F, 1W, 1S) Staff


129. Governmental 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. (Not taught 1956-57.) Staff

MANAGEMENT

The degree program in Management is offered through the combined resources of the Schools of Business and Social Sciences, Education, and Engineering and Technology. It is designed to provide professional training in executive development for business and industry. Majors are offered in three areas:

1. Business Management. Gives training in executive development for students whose basic training is in the field of Business Administration.

2. Industrial Management. Gives training in executive development for students whose basic training is in Engineering, Technology or Industrial Education.


Students will obtain a degree in one of the three schools participating in the program, with a major in the department of special interest and emphasis. A core curriculum is taken by all students in Management. In addition the student takes the special courses required for specialization in the particular phase of Management for which he is preparing. The core curriculum is shown below. The special courses for the department majors are shown in the departments concerned: Business Administration, Industrial Education and Psychology and Sociology.
# The Core Curriculum

(For All Students in Management)

## Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics 51, General Economics</td>
<td>5</td>
</tr>
<tr>
<td>Psychology 53, General Psychology</td>
<td>5</td>
</tr>
<tr>
<td>Speech 1, Public Speaking</td>
<td></td>
</tr>
<tr>
<td>Political Science 1, Government and the Individual</td>
<td>5</td>
</tr>
<tr>
<td>Math. 34, Introduction to College Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math. 35, College Algebra</td>
<td>5</td>
</tr>
<tr>
<td>Military Science 1, 2, 3</td>
<td>3</td>
</tr>
<tr>
<td>Work Experience in Industry (10 weeks)</td>
<td></td>
</tr>
</tbody>
</table>

## Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany 1, Principles of Biology</td>
<td>5</td>
</tr>
<tr>
<td>Physiology 4, General Physiology</td>
<td>4</td>
</tr>
<tr>
<td>Sociology 70, Principles of Sociology</td>
<td>5</td>
</tr>
<tr>
<td>Chemistry 31, 32, Physical Science</td>
<td>6</td>
</tr>
<tr>
<td>Political Science 11, Commercial Law</td>
<td>3</td>
</tr>
<tr>
<td>Military Science</td>
<td></td>
</tr>
<tr>
<td>Work Experience in Industry (10 weeks)</td>
<td></td>
</tr>
</tbody>
</table>

## Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind. Educ. 118, Industrial Safety</td>
<td>3</td>
</tr>
<tr>
<td>Psychology 155, Psychology of Business and Industry</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Educ. 102, Instructional Aids</td>
<td>3</td>
</tr>
<tr>
<td>Psychology 161, Social Psychology</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Adm. 109, Accounting (Applied)</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 125, Trade Unions and Collective Bargaining</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 126, Trade Unions and the Law</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 127, Social Security</td>
<td>3</td>
</tr>
<tr>
<td>Work Experience in Industry (10 weeks)</td>
<td></td>
</tr>
</tbody>
</table>

## Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociology 241, Community Organization</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Educ. 119, Job Evaluation and Wage Incentives</td>
<td>3</td>
</tr>
<tr>
<td>Human Relations in Industry</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Adm. 133, 134, 135, Industrial Manage. Problems</td>
<td>9</td>
</tr>
</tbody>
</table>

# BUSINESS MANAGEMENT

(Courses required in addition to the core curriculum)

## Freshman Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.A. 1, Introductory Accounting</td>
<td>5</td>
</tr>
<tr>
<td>Econ. 52, Economic Problems</td>
<td>5</td>
</tr>
<tr>
<td>B.A. 2, Introductory Accounting</td>
<td>5</td>
</tr>
<tr>
<td>English 1, 2, 3 Basic Communications</td>
<td>9</td>
</tr>
</tbody>
</table>

## Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.D. 59, Blueprint Reading and Industrial Drawing</td>
<td>3</td>
</tr>
<tr>
<td>T.E. 56, Machine Practice for Engineers</td>
<td>3</td>
</tr>
<tr>
<td>P.S. 12, Commercial Law</td>
<td>3</td>
</tr>
<tr>
<td>T.E. 58, Manufacturing Processes</td>
<td>2</td>
</tr>
<tr>
<td>P.S. 13, Commercial Law</td>
<td>3</td>
</tr>
</tbody>
</table>

## Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.A. 130, Corporation Finance</td>
<td>3</td>
</tr>
<tr>
<td>B.A. 131, 132 Business Statistics</td>
<td>6</td>
</tr>
<tr>
<td>Econ. 165, Money, Credit &amp; Prices</td>
<td>3</td>
</tr>
<tr>
<td>T.E. 158, Manufacturing Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 171, Business Cycles</td>
<td>3</td>
</tr>
<tr>
<td>I.E. 120, Personnel Relations</td>
<td>3</td>
</tr>
</tbody>
</table>

## Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ. 174, Govt. and Business</td>
<td>5</td>
</tr>
<tr>
<td>Econ. 107, 108, Intermediate Economic Theory</td>
<td>6</td>
</tr>
<tr>
<td>B.A. 111, Ind. Cost Accounting</td>
<td>5</td>
</tr>
<tr>
<td>B.A. 150, Managerial Accounting</td>
<td>4</td>
</tr>
<tr>
<td>B.A. 149, Business Policy</td>
<td>4</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td>B.A. 136, 137, 138, Production Management</td>
<td>9</td>
</tr>
</tbody>
</table>
20. Problems of Small Business. A survey of problems encountered in starting a small business. Problems and details of actual operating procedures are considered. Designed to aid the man just entering business. (5W or S, 1956-57) 

29. Managing Personal Finances. Designed to aid in meeting the growing complexity of personal finance: how to avoid financial entanglements, installment buying, borrowing money, owning or renting a home, investing and speculating in securities, everyday legal problems dealing with illness, death, personal taxes. (5W) 

30M. Business Mathematics. For students in B.A. Students with good placement scores in mathematics and in credit college algebra should not register for this. Does not fill group requirement. (3F) 

125, 126, 127. Labor Problems. (See Economics 125, 126, 127.) Required of all business administration majors. 

130. Corporation Finance. The structure of corporate enterprise. Financial and operating ratios and proper financial plans and methods of marketing securities are considered. Practical problems emphasized. Prerequisite: Econ. 51, 52 or equivalent; B. A. 1, 2. (3S) 

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

133, 134, 135. Industrial Management Problems. Problems in industrial location; choice of site; buildings and layouts; selection, purchase, and arrangement of equipment; purchasing of stores; organization; industrial research; labor relations and problems in managerial control. Problems in work simplification, time and motion study included in 134. Prerequisite: B. A. 20. (3F, W, S) 

136. Development of Scientific Management. A study of the contributions of Taylor, the Gilbreths, Emerson, Barth and other leaders in the development of improved management. (3F) (Not given in 1956-57) 

138. Production Planning and Control. Study and application of principles of sound analysis leading to installation and operation: product engineering, production engineering, scheduling, inventory control, order preparation, tool control, dispatching, and cost control in the production process. (3S) (Not given 1956-57) 

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 over insurance companies.
Social Psychology. (See Sociology 40, 140 and Psychology 161.) Recommended for all business administration majors.

141. Real Estate. Introduction to real estate contracts, forms, principles, and recent Federal housing legislation. (3W) (Not given 1956-57) Staff

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


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

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

Business Cycles. (See Econ. 121.) Required of all Bus. Adm. majors.
Money, Credit, and Prices. (See Econ. 165.) For Bus. Adm. majors.
Office Management. (See Sec. Sci. 175.) Required of all accounting majors.
Economics of Business Cycles. (See Econ. 171.) Required of all Bus. Adm. majors.

Government and Business. (See Econ. 174.)

191. Business Administration Seminar. Special reports and group discussion on current developments in business. Open only to qualified juniors and seniors. (2S) Staff

199. Internship in Accounting. Practical experience with public accounting firms in Intermountain region and Pacific coast for selected seniors. Credit arranged, not to exceed 6.0.

BUSINESS AND DISTRIBUTIVE EDUCATION

The School of Commerce and the School of Education co-operate in meeting the demand for well-trained teachers of business subjects. In selection of their courses in Business Administration, Secretarial Science, and Education, students should consult Professor Ina Doty, senior staff member in secretarial science.

MERCHANDISING

Principles of Marketing. (See Ag. Econ. 62) Required of all majors in business administration and merchandising.

63. Salesmanship. The history, development and opportunities in sales work. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance are studied. Special projects are carried out in relation to a particular type of selling. Lectures and assigned cases. (4F or S) Staff
151, 152, 153. Problems in Merchandising. Selected cases are used to teach methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. (3F, W, S) Staff

154. Purchasing. The significance of purchasing as a major activity in modern business. Consideration given organization, policies, and control of the procurement function. Lectures and problems. (3F) (Not taught 1955-56) Staff

156. Principles of Advertising. Intended for those who as business executives will direct publicity programs: includes study of the structure of advertisements, appeals used in the preparation of advertisements for different products, choice of media, consumer research, and the work of advertising departments and agencies. (5S) (Not taught 1956-57) Johnson

157. Advertising for Small Business and the Retail Store. Studies direct mail, radio, television, newspaper, window display, and layout practices. Designed to assist student in judging advertising effectiveness as a sales tool for the small businessman. (5F) Staff

160. Sales Management. Aims to give 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 the sales organization and correlation of its activities with those of production and other departments of the business enterprise. (5W) (Not given 1956-57) Johnson

161, 162, 163. Problems in Retail Distribution. 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. (3F, W or S) (Not given 1956-57) Johnson

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

Economics

Evan B. Murray, Professor and Head of Department; V. L. Israelsen, Professor; Leonard J. Arrington, Associate Professor.

Students majoring in the Department of Economics should register with the department chairman after they achieve junior standing. Some variation is permitted in the program of study depending on whether the student is preparing to do graduate study in Economics or is planning to enter law school, teaching, government service, or employment with private business. Students who plan graduate study in Economics should have thorough training in mathematics. Majors in this department draw heavily on the course offerings of other departments in the School of Business and Social Sciences.
The Department of Economics offers a program of study leading to the Master of Science degree.

26. Economic Development of Europe. The classical and medieval heritage of modern Europe. The Commercial Revolution and the Industrial Revolution: their history, consequences and interrelationship with political and social development. (3F) Staff

50. General Economics. An abbreviated course in General Economics for students in certain fields of engineering. (3W and S) Staff

51. General Economics. For the college student regardless of field of specialization. Emphasis is on the understanding of principles and institutions underlying operations of the economic system. (5F, W and S) Staff

52. Economic Problems. Continuation of Economics 51. Problems of labor, finance, economic instability, international economics, government control, and world economic systems. (5F, W and S) Staff

106. History of Economic Thought. A critical study of the origin and the development of the economic theories of leading thinkers in Western Civilization from 1750 to the present. (3F) Israelsen

107, 108. Intermediate Economic Theory. Critical analysis of present-day price, distribution, and income theory. Required of all students majoring in Business Administration, Agricultural Economics, and Economics. Prerequisites: Economics 51, 52, or Agricultural Economics 53. (3W or S) Israelsen

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

126. Trade-Unionism and the Law. The legal frame-work of the trade union activity; restrictive, permissive, and promotional legislation; the judiciary and labor. (8W) Murray

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

131, 132. Business Statistics. (See Business Administration 131, 132.)

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. Prerequisite: Economics 51, 52. (3F) Israelsen

143. Economy and Trade of Latin America Influences exerted by Latin America on world trade. Alternates with Economics 140. (3F) Staff
145. Economics of Consumption. Deals with personal and group expenditure, standards of living, budgets, variations in consumption. (3W) Staff

150. Comparative Economic Systems. Important present forms of economic organization; their history, theory, and practices. Emphasis on Capitalism, British Socialism, German Fascism and Soviet Communism. (3S) Arrington


165. Money and Banking. Development of our present monetary and banking systems; a critical analysis of central banking. Prerequisites: Economics 51, 52. (3F) Israelsen

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

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

174. Government and Business. History and development of regulation and control of business by government. Monopolies, combinations, cartels, public utilities, and transportation are explored. (5F) Arrington

180. Income and Employment. Analysis of factors determining the general level of output, income, and employment; discussion of public policies designed to maintain full employment and high production. (2S) Arrington

200. Research in Economics. Special investigations carried on by senior and graduate students. Credit granted according to work done. (F, W, and S) Staff

201. Readings and Conferences. For senior and graduate students. Time and credit arranged. 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) Murray

206. Income Theory. Factors determining the general level of output, income and employment; public policies designed to maintain full employment and high production. Open to graduates and seniors with adequate preparation. (2W) Arrington

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

209. Graduate Seminar. Designed to acquaint students with methods of research in economics. A survey of the literature of economic research and practice in the carrying forward of research projects. Prerequisite: permission of instructor. (2) Murray

211. Graduate Seminar. Same as Economics 209, except that emphasis is placed upon a study of bibliographical materials in economics and a study of economic literature. Prerequisite: permission of instructor. (2) Murray

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

M. R. Merrill, Professor and Head of the Department; Joel E. Ricks, Professor Emeritus; J. Duncan Brite, Professor; S. George Ellsworth, Wendell B. Anderson, Associate Professors; M. Judd Harmon, Assistant Professor; Charles Olson, Lecturer.

History

Professors Ricks, Brite, Ellsworth.

Students who major in History should complete History 4, 5, 13, 14, and other courses recommended by their particular advisers. History majors intending to pursue graduate study should complete two years of French or German.

Students who minor in History should consult with a faculty member in the department for specific recommendations before registering in the minor field.

Survey Courses

1. Early European History. A survey of the medieval and early modern European periods from the fall of the Roman Empire through the Renaissance, the Reformation, and the religious wars. (5) Brite


4. Ancient World Civilization. The cultural history of the world from the earliest times to the sixteenth century. The Near and Far Eastern civilizations with emphasis on the European heritage: Greece, Rome, Christianity, the Middle Ages, Renaissance and Reformation. (5F, W or S) Ellsworth

5. Modern World Civilizations. The cultural history of the world from the sixteenth century to the present. Emphasis on European civilization and its spread in the world—the Americas, the Near and Far East. (5W or S) Brite

8. Recent European History. From the Treaty of Versailles in 1919 to the present, emphasizing the problems following World War I, the causes of World War II, and the period since 1945. (3 W) Brite

9. Current World Affairs. An historical inquiry into the evolution and development of the United Nations organizations, the domestic problems and foreign relations of the major world powers since 1945. (1) Ellsworth

10. American Civilization. The American heritage studied through a characterization of major periods and movements, the development of the institutions and social ideas of the United States. (3F') Ellsworth

13. Early United States History. Includes the colonization of the Atlantic seaboard, the Westward Movement, the revolution, the Constitution, the beginnings of American government, the rise of American democracy, social and economic movements, the rise of sections, expansion, nationalism, and the Civil War. (5F, W or S) Ricks

14. Modern United States History. Reconstruction, industrialism, the last frontier, the agrarian revolts, imperialism, the eras of reform, American culture, the new democracy and the two World Wars. (5F, W or S) Ricks

History 21. The Americas to 1763. Geography, pre-Columbian peoples, conquest and colonization by European powers, international rivalries, political, social and economic developments. (3 W) Ellsworth

History 22. The Americas since 1763. The eve of the revolutions, the Anglo-American and Spanish-American revolutions, early development of the United States and Latin American republics, Brazil and Canada, their political, social and economic development, their role in the contemporary world. (3S) Ellsworth
34. English History. English history from the earliest times to the present day. Particularly valuable for English majors and pre-legal students. (5F)

**History of Europe**

105. Greek History. Greek civilization to the Roman conquest, 146 B.C. Emphasizes political, social, intellectual and artistic developments and contributions. (5 W) Ellsworth

106. Roman History. From the earliest times to the decline of the Roman Empire in the nth century A.D. (5S) Ellsworth

111. Medieval Europe (500-1500 A.D.). Political, economic, social and cultural developments during the Middle Ages. (3) Brite

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

125. Absolute Monarchies (1589-1789). From the rise of French absolutism to the French Revolution. (3) Brite

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

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

138. The History of Russia. From the earliest times to the present day. (3W) Brite

**History of the United States**

132. History of the American Frontier. To the Far West. (3F) Ricks

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

137. History of Utah. Geography and native peoples; early explorations; political, social and economic developments to the present with emphasis on territorial period. (3F) Ellsworth

History 143. The Jacksonian Era. Political, economic and cultural developments 1815-1850. American society, industry and commerce, labor, cultural developments, reform movements, the westward movement, extension of the suffrage and the coming of democracy. (3W) Ellsworth

144. The Civil War and Reconstruction. (3) Ricks

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

History 156. Social History of the United States. The development of the patterns of American life, social ideas, education, religion, science, literature and the arts, studied around a framework of major thought forms. The relation of these developments to public policies. (3 F) Ellsworth

159. Recent United States History. Domestic and foreign affairs of the United States since World War I, emphasizing the development of modern America and her role in World affairs. (3) Ellsworth

171. Constitutional History of the United States. (5W) Ricks

175. History of American Democratic Thought. American democratic thought from the Revolutionary War to the present. (3) Ricks

**Far Eastern History**

176. History of the Far East. The emphasis will be on China, Japan, and Russia since 1900. (3S) Brite

**Seminar**

193. Bibliography and Writing of History. Undergraduate professional course for those desiring special training in any type of historical research. Required of all seniors majoring in History. (3 F) Ellsworth

**Graduate Courses**


239. Readings and Conference in Special Areas. (Arr. F, W, S) Staff
Political Science

Students majoring in Political Science are expected to have their course schedules approved by the head of the department for at least six quarters prior to graduation. Exceptions may be made by the department faculty.

1. Government and the Individual. The course proposes to introduce the student to the political world of American democracy. Totalitarian governments and the philosophies of fascism and communism that form the theoretical bases of these regimes are also studied. Democracy as practiced in the United States and Great Britain is contrasted with these systems. (5F, W, or S)

Professors. Merrill, Anderson, Harmon, Olson.

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

11, 12, 13. Commercial Law. Course 11 is a general survey intended for all students who are interested. It is also an introductory course for students who take additional Commercial Law courses. Courses 12 and 13 are devoted to a comprehensive study of the law of contracts and agency. Open to all students of sophomore standing or above. (3F, 3W, 3S)

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

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

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

101. American Foreign Policy. The place of the United States in the world of nations as affected by our traditions, interests, and interpretations of international affairs. (3F, S)

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

104, 105, 106, 107, 108. Commercial Law. Course 104 studies the law of negotiable instruments; 105 and 106 include study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108. 107 and 108 will be given in 1957-58, and 105 and 106 will be given in 1956-57. Prerequisites: Political Science 11, 12, 13 or the consent of the instructor. (3F, 3W, 3S)

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

111. International Organization. Examines briefly the attempts to achieve some type of international organization. Major emphasis is on the League of Nations and United Nations, including such organizations as United Nations Educational Scientific and Cultural Organization, World Health Organization, Food and Agriculture Organization, International Labor Organization, the World Bank, and World Monetary Fund. (3S)
117, 118, 119. American Political Thought. A survey of American political ideas and the men who developed them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present. Emphasis is on ideas that have been significant in shaping the form and actions of American government today. Students may register for one, two, or three quarters. (2F, 2W, 2S) Harmon

125. Political Parties and Practical Politics. Organization and practices of political parties. (3S) Staff

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

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

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

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

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

136, 137, 138. Student Government. Course 136 studies problems of student government, group dynamics, and parliamentary law and is a pre-requisite to courses 137 and 138 which are under the supervision of the Dean of Students and based upon significant student government activities. They include an evaluation of such activities and any appropriate recommendations for future student leaders. (1F, 1W, 1S) Anderson

140. American Legislation. The course 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 method of approach is used as far as is feasible. Parliamentary law is emphasized. (3W) Anderson

145, 146. History of Political Thought. No. 145 covers political thought from its beginnings in the Greek period to Machiavelli. No. 146 carries on the study from Jean Bodin to Bentham. Students may register for the courses separately. (3F, 3W) Anderson

150. Recent Political Thought. Political ideas and political thinkers from the Utilitarians to the present time, with special emphasis on study of Karl Marx and his successors in Communist political philosophy. (3S) Harmon

180, 181, 182. Current Political Problems. A series designed for upper division students. Students may take any quarter without the preceding quarter or quarters. Lower division students must receive the consent of the instructor. (2F, 2W, 2S) Merrill

201. Research in Political Science. For senior and graduate students. Time and credit arranged. Staff

203. Readings and Conferences. For senior and graduate students. Time and credit arranged. Staff
SCHOOL OF BUSINESS AND SOCIAL SCIENCES

205. Methods in Political Science. Methods the political scientist must use that are common to all sciences, the particular problems with which the social scientist is confronted, and their application to the special problems of political science. (3W)

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

211. Thesis. For graduate students who are preparing a master's degree thesis. Time and credit arranged. 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)

Pre-Legal Training

Students who plan to enter the profession of Law may pursue a course of study, primarily in the School of Business and Social Sciences, that will not only prepare them to meet all entrance requirements in any American law school, but will also form an excellent foundation for the study of law. Some law schools admit only college graduates. Others admit students on the basis of three years of college training. College graduation is desirable even when it is not required for admission.

Students should consult Dean M. R. Merrill or Prof. Wendell Anderson.

Secretarial Science

Ina Doty, Associate Professor; Floris Olsen, William Tezak, Assistant Professors; Helen Lundstrom, Instructor.

Students majoring in Secretarial Science are urged to complete the following courses in addition to institutional requirements for graduation.

Curriculum in Secretarial Science for B. S. Degree

<table>
<thead>
<tr>
<th>Dept.</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>Sec. Sci.</td>
<td>30</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>41, 42, 43</td>
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<tr>
<td>Sec. Sci.</td>
<td>51</td>
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<tr>
<td>Sec. Sci.</td>
<td>65</td>
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<tr>
<td>Sec. Sci.</td>
<td>69, 70, 71</td>
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<td>Sec. Sci.</td>
<td>75, 76, 77</td>
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<tr>
<td>Sec. Sci.</td>
<td>80, 81, 82</td>
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<tr>
<td>Sec. Sci.</td>
<td>92 or 94</td>
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<td>Sec. Sci.</td>
<td>96 or 98</td>
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<td>Bus. Adm.</td>
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<td>Bus. Adm.</td>
<td>20</td>
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<tr>
<td>Bus. Adm.</td>
<td>30</td>
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<tr>
<td>Pol. Sci.</td>
<td>11</td>
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<tr>
<td>English</td>
<td>5</td>
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<tr>
<td>Econ.</td>
<td>51, 52</td>
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<tr>
<td>Sec. Sci.</td>
<td>167</td>
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<tr>
<td>Sec. Sci.</td>
<td>170</td>
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<tr>
<td>Sec. Sci.</td>
<td>175</td>
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<tr>
<td>Sec. Sci.</td>
<td>183, 184, 185</td>
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<td>Sec. Sci.</td>
<td>186, 187</td>
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<tr>
<td>Sec. Sci.</td>
<td>180</td>
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<tr>
<td>Sec. Sci.</td>
<td>179</td>
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<tr>
<td>Sec. Sci.</td>
<td>190</td>
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<tr>
<td>Econ. Upper Div.</td>
<td>Elective</td>
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</tbody>
</table>
Students who wish to qualify for a teaching certificate should add the following courses: Psychology 102, Education 113, Bacteriology 155; Education 114, 116 or 141; Education 111, 127, 129, and 130; Methods in Secretarial Science 179 and 180.

A two-year course is also offered in Secretarial Science for students who wish to qualify themselves for secretarial positions as quickly as possible. An official certificate is granted at the graduation exercises to those who successfully complete the two year course. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.

Two-Year Secretarial Course
Certificate Granted Upon Completion

First Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>Fall</th>
<th>Winter</th>
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</thead>
<tbody>
<tr>
<td>Basic Communications</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1st Q. Shorthand</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Typewriting 41</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Bus. Math. 30</td>
<td>3</td>
<td>SS 53</td>
</tr>
<tr>
<td>Biology</td>
<td>5</td>
<td>SS 92 or 94</td>
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<tr>
<td>P. E. or M. S.</td>
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<td>P. E. or M. S.</td>
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<td></td>
<td>17</td>
<td>16</td>
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</tbody>
</table>

Second Year

<table>
<thead>
<tr>
<th>Courses</th>
<th>Fall</th>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. Shorthand 80</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Transcription 69</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bus. Admin. 20</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Political Science 11</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Office Practice 167</td>
<td>2</td>
<td>SS 30</td>
</tr>
<tr>
<td>P. E. or M. S.</td>
<td>1</td>
<td>P. E. or M. S.</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

30. Business Communications. Fundamental principles of business letter writing, such as sales, order, collection, adjustment, and application letters. (3W) Lundstrom

41. First-Quarter Typewriting. For students who have had no previous training in typewriting. Designed to develop a thorough knowledge of the keyboard and machine parts. Personal-use typing problems, centering, letter styles. (2F, W, S) Lundstrom

42. Business Typewriting. For students who have had previous training in typewriting. Practice in typing letters, envelopes, manuscripts, business forms. (2F, W, S) Lundstrom

43. Secretarial Typewriting. Typing of minutes, legal forms, business forms, rough drafts, stencils for duplication. (2F, W or S) Lundstrom

45. Speed Building. Remedial typewriting; emphasis on improvement of accuracy and speed. (1 F, W, or S) Lundstrom

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

*69. Transcription Practice. Designed to develop skill and speed in transcription. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words per minute. (1F or W) Doty; Olsen

*70. Transcription Practice. Continuation of 69. (IW or S) Doty; Olsen

*71. Transcription Practice. Continuation of 70. (1S) Doty

75. First-Quarter Shorthand. For students who have had no previous training in shorthand; includes study of fundamentals of simplified Gregg shorthand. (3F or W) Doty; Olsen

76. Second-Quarter Shorthand. Continuation of course 75. Introduction of new-matter dictation. (3W or S) Doty; Olsen

77. Third-Quarter Shorthand. Continuation of course 76. Intensive practice in new-matter dictation. (3F or S) Olsen; Doty

80. Intermediate Shorthand. For students who have had previous training in shorthand and who are able to take dictation at not less than 60 words per minute and type at least 40 words per minute. Includes review of the theory of simplified Gregg shorthand and development of new vocabulary. Students must register for Transcription Practice 69. (3F or W) Olsen

81. Intermediate Shorthand. Continuation of 80. Must be accompanied by Transcription Practice 70. (3WS) Olsen

82. Intermediate Shorthand. Continuation of 81. Must be accompanied by Transcription Practice 71. (3S) Olsen

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

94. Burroughs Calculator. Practice in addition, multiplication, subtraction, and division on Burroughs calculators and application of the machine to such business computations as percentages, discounts, prorating, decimal equivalents, and constants. (2F, W or S) Olsen


98. Commercial and Bank Posting. Application of the Burroughs posting machine to bookkeeping procedures in commercial and financial institutions and banks. (2F, W or S) Olsen

I. B. M. Machine Operation. (See Applied Statistics, page 121.)

167. Office Practice. Training in use of dictating and transcribing machines, spirit duplicator, mimeograph, mimeoscope. (2F, W or S) Doty

170. Statistical Typewriting. For juniors and seniors majoring in business administration, economics, and secretarial science. Practice in setting up charts, tables, and reports. Prerequisite: Sec. Sci. 41, 42, 43, or equivalent. (2S) 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. Prerequisites: Bus. Ad. 1 and 2 and Econ. 51 and 52. (3F) Staff

179. Methods of Teaching Typewriting and Bookkeeping. Recent developments and practices in teaching of typewriting and bookkeeping. Analysis of objectives, laws of learning, organization of material, texts, standards of achievement, and methods of presentation. (3W) Doty Neuberger

*Required of all who register for Intermediate Shorthand 80, 81, 82.
180. **Teaching of Shorthand.** Methods and trends in teaching shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3F)

183, 184, 185. **Advanced Speed Course in Shorthand.** For students who have had at least two years of shorthand and are able to take dictation at not less than 100 words a minute. Emphasis on increasing shorthand speed through speed phrases and reporting shortcuts. Practice in advanced transcription. (3F, 3W, 3S) Doty

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

189. **Practicum in Business Education.** Provides opportunity for planning and development of practical or creative projects in Business Education. Experienced teachers and students who are registered for teacher training, are encouraged to build projects around actual school situations. (1-2F, W or S) (Not taught 1955-56)

190. **Seminar in Business Education.** A reading and research course for junior and senior students majoring in business administration and secretarial science. Special reports are made on current business education problems and literature. (2S) (Not taught 1955-56)

200. **Research in Business Education.** For senior and graduate students. Time and credit arranged. (F, W or S) (Not taught 1955-56)

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**Social Science**

Edwin L. Peterson, Assistant Professor.

1. **General Social Science.** A basic general education course for those interested in a synthesis of the social science disciplines. (5F, W, or S) Peterson

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**Sociology**

R. Welling Roskelley, Professor and Head of Department; Don Carter, Carmen Fredrickson, Associate Professors; Evelyn H. Lewis, C. Jay Skidmore, Therel R. Black, William A. DeHart, Assistant Professors.

Joseph A. Geddes, Professor Emeritus.

Majors in Sociology must meet the group requirements for graduation. In addition, they are expected to complete a minimum of 47 credits in Sociology distributed in the following fields: General and Historical, 5 credits; Social Organization, 6 credits; Social Problems, 6 credits; Social Psychology and the Family, 6 credits; Social Research and Statistics, 3 credits; Seminar, 6 credits; Cultural Anthropology, 3 credits; Social Work, 9 credits; Population and Industrial Sociology, 3 credits.

Either Sociology 10 or 70 is prerequisite for all upper division courses in Sociology; also Sociology 40 for 140, and 60 for 160.

**Master of Science Degree in Sociology**

The Department of Sociology offers courses leading to the Master of Science degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies.

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**Doctor of Philosophy Degree in Sociology**

Institutional requirements for the Ph.D degree are explained in the section "Graduate School." This degree is offered in the Department of Sociology through collaboration with closely related departments in the social sciences.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisite(s)</th>
<th>Credits</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>American Culture. Basic beliefs, values, customs, and institutions of the American people. Also a study of governmental,</td>
<td>(3F) Black</td>
<td>3F</td>
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<td></td>
<td>educational and other agencies consciously concerned with improvement of American life.</td>
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<td>Black</td>
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<tr>
<td>10.</td>
<td>Rural Sociology. Background information which will lead to a more enlightened rural and urban citizenry through better</td>
<td>(5 F, W, or S)</td>
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<td>Roskelley;</td>
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<td></td>
<td>understanding of and plans for resolving rural problems dealing with organization, institutions, social processes, and</td>
<td></td>
<td></td>
<td>Black</td>
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<td></td>
<td>population.</td>
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<tr>
<td>40.</td>
<td>Social Psychology I. Personality development among social classes and peoples. Analysis of crowds, social movements,</td>
<td>Sociology 70 or Psychology 53.</td>
<td></td>
<td>DeHart</td>
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<tr>
<td></td>
<td>social conflicts and other collective behavior; ideologies and institutions. Prerequisite: Sociology 70 or Psychology 53.</td>
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<tr>
<td>60.</td>
<td>Courtship, Marriage and the Family. Designed to help all students understand the social and emotional factors in personality</td>
<td>Open to all students. (3F, W or S)</td>
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<tr>
<td></td>
<td>development, courtship, mate selection, and marriage adjustment. Open to all students. (3F, W or S)</td>
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<tr>
<td>70.</td>
<td>Introductory Sociology. Open to students in all departments. Emphasis upon developing understanding of the social world, and</td>
<td>Sociology 70 or 10 is prerequisite to all</td>
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<td>how social experience contributes to personal development. Sociology 70 or 10 is prerequisite to all upper division classes in</td>
<td>upper division classes in sociology and</td>
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<td></td>
<td>sociology and social work. (5F, W or S)</td>
<td>social work.</td>
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<tr>
<td>87.</td>
<td>Elementary Social Statistics. Techniques of using statistical method in studying social problems with emphasis upon logical</td>
<td>(3F) Staff</td>
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<td>methods of collection, tabulation, graphic portrayal, averages, dispersion, reliability, elementary sampling and simple</td>
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<td></td>
<td>correlation with brief consideration of theoretical implications. For majors in Sociology and Social Work. (3F)</td>
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<tr>
<td>100.</td>
<td>Educational Sociology. The influence of the social processes and social changes on school curricula, objectives and teachers.</td>
<td>Open to students in all departments.</td>
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<tr>
<td></td>
<td>Appraisal of educational goals in the light of present social needs. (3)</td>
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<td></td>
<td>Black</td>
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<tr>
<td>110.</td>
<td>Utah Social Problems. Present-day problems in population, migration, housing, insurance, manufacturing, temperament, and</td>
<td>(3) DeHart</td>
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<tr>
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<td>safety. (3)</td>
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<tr>
<td>130.</td>
<td>Introduction to Cultural Anthropology. Study of the attitudes, ideas, behavior, social organization, and material results of</td>
<td>(3S) Black</td>
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<td></td>
<td>selected primitive and contemporary cultures.</td>
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<td></td>
<td>Black</td>
</tr>
<tr>
<td>131.</td>
<td>The American Indian. Indian cultures, problems, and needs. Programs for the improvement of Indian adjustment. Actual and</td>
<td>(3S) Black</td>
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<td>potential contributions of Indian knowledge and philosophy to our way of living. (3S)</td>
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<td>Black</td>
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<tr>
<td>140.</td>
<td>Social Psychology II. Relationship between personality development and ideological patterns among various social classes and</td>
<td>Social 40. (3S)</td>
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<td></td>
<td>cultures. Prerequisite: Soc. 40. (3S)</td>
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<tr>
<td>141.</td>
<td>Rural Community Organization and Leadership. Analysis of forces and procedures at work in developing community organization,</td>
<td>(3F) Staff</td>
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<td>with special emphasis on techniques of training leaders to help make the community more effective. (3F)</td>
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<tr>
<td>144.</td>
<td>Women Today. Progress of women in American society since Colonial days; their struggles for status in industry, politics,</td>
<td>(3W) Fredrickson</td>
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<td>education, sex, religion, and the arts. Roles and contributions of outstanding women. (3W)</td>
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<td>145.</td>
<td>Alcoholism. See P. E. 145. (3S)</td>
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<td>Nelson</td>
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<tr>
<td>153.</td>
<td>History of Social Thought. Development of social thought from early periods is traced to August Comte. From this point,</td>
<td>(3S) Roskelley</td>
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<tr>
<td></td>
<td>important developments in Europe and America are studied, with emphasis on American thought. (3S)</td>
<td></td>
<td></td>
<td>Roskelley</td>
</tr>
</tbody>
</table>
154. Population Problems. The nature of population growth and decline studied in reference to international, national and local social problems. Significance of present population distributions, characteristics, and trends. (3W) Roskelley

156. Social Institutions. Similarities and differences in life histories of institutions as they emerge, grow, and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. (3S) De Hart

158. Human Relations in Industry. Designed to extend understanding of the human or social characteristics involved in the operation of modern industry. The pattern of social relations that affect work behavior will be studied. (3S) DeHart

160. Family Relations. The social-emotional development of the child in the family; marital adjustment; social-culture difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60 (3S) Skidmore

161. Modern Social Problems. An approach based on adjustment to instruments of change as a means of minimizing disorganization. (3W) Fredrickson


172. Juvenile Delinquency II. Origin and operation of the Juvenile Court. Detention, probation, placement, and institutional care, as methods of rehabilitation and correction. (3W) Staff

174. Introduction to Criminology. Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation, and methods of prevention and treatment. (3S) Staff

180, 181, 182. Current Sociological Problems. For upper division and graduate students. (1F, 1W, 1S) Staff

190. Seminar in Sociology. Time arranged. Required for majors in Sociology. (1F, 1W, 1S) Staff

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

202. The Study of Society. Basic principles of sociology are considered in their theoretical and scientific settings, as a body of facts, a method of investigation, and an explanation of associate living. (5W) Black

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

207. Graduate Seminar. Short subjects within the field of Sociology and pertinent to but not available in regular courses are selected for study. (2W) 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. (3S) Roskelley

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

262. Instructional Problems in Family Life Education. Methods, materials, and content for teachers dealing with the social, emotional and cultural phases of Family Life Education. (3) Skidmore

263. Marriage Counseling. The philosophy, principles, and techniques of pre-marital and marriage counseling. (3) Skidmore
287. Methods of Social Research. Formulating problems, collecting, analyzing, and interpreting data in social research. (3F) Roskelley

301. Research Methods in Criminology. Careful study and analysis of problems, methods, techniques, and outlook involved in criminological research. (3S) Staff

DIVISION OF SOCIAL WORK

R. W. Roskelley, Director; Evelyn H. Lewis, Assistant Professor, assisted by Sociology staff.

Joseph A. Geddes, W. B. Preston, Professors Emeritus.

The demand for social workers exceeds the qualified personnel available for employment. 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 July, 1952, the graduate schools and undergraduate departments of social work joined forces with other segments of the profession to provide for 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 later undertaking graduate study in social work. More than 60 undergraduate departments of social work have been approved by the Membership Committee 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 B.S. degree in social work are: S.W. 165, 173, 175, and S.W. electives, 12 hours; Economics 127, 145, 180; Political Science 129; Psychology (9 hours selected from:) 105, 121, 140, 161, 183; Sociology (12 hours selected from:) 130, 141, 160, 161, 170, 172; Child Development 67.

During the freshman and sophomore years, students should take the following courses, in addition to filling the general group requirements for graduation: (Most of these courses may be applied towards the Social Science group requirement) Economics 51; Political Science 1 or 10; Psychology 53; Sociology 10 or 70, 40.

162. Mental Hygiene. Social and cultural changes that have given rise to problems of adjustment. Reactions to stress: "preventive" growth and adaptation. (3W) Lewis

165. Culture and Personality. The process of personality development, with emphasis on the influence of culture, social class, and the nature of personal experiences. (3F, S) Roskelley

173. The Field of Social Work. Contemporary social work as it is divided into the following areas of activity: social casework, social group, community organization and social action. Objectives, processes, and personnel requirements of social work agencies. Social Work majors should take S.W. 175 concurrently. (3F) Lewis

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

175. Introduction to Field Work. Acquaints students with various agencies dealing with social work and related areas, includes field trips. Should be taken concurrently with S.W. 173. (1F) Lewis
177. **Social Treatment of Children's Problems.** Analysis and treatment of problems of children. (3S) **Lewis**

178. **Adolescence.** Social adjustment of the adolescent, as influenced by the nature of the culture in which he lives. Methods of working with adolescents. (3W) **Staff**

180. **Group Relations and Group Dynamics.** Analysis of group and inter-group relations and processes. Methods of group work, leadership, and group dynamics are emphasized. (3S) **DeHart**

182. **Children in Institutions.** Principles underlying care and treatment of children in voluntary or non-custodial institutions. Development and trends in institutional care. (3S) **Lewis**

195. **Social Work Seminar I.** A study of social work publications and other source material applicable to the field. Required of majors in Social Work. (IF) **Lewis**

196. **Social Work Seminar II.** Analysis of behavior causation and motives through use of literature and case studies. (1W) **Lewis**

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

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

201. **Social Case Work II.** A continuation of Social Case Work I. Further application of principles and methods, especially in relation to social case recording and development of skill in relationship. (3W) **Lewis**

202. **Social Case Work III.** Application of case work principles and techniques as affected by agency setting and by special types of client needs. Consideration is given to case work with children, families, aged, and the emotionally or physically ill. (3S) **Lewis**

210. **Field Work I.** Field work centers are maintained in selected public and private agencies; supervision is provided under college direction. S.W. 200 should precede or be taken concurrently. (2-4F or W) **Lewis**

211. **Field Work II.** A continuation of Field Work I. S.W. 201 should precede or be taken concurrently. (2-4W or S) **Lewis**

212. **Field Work III.** A continuation of Field Work II. S. W. 202 should precede or be taken concurrently. (2-8S) **Staff**

222. **Social Work in Rural Communities.** Social work in relation to problems of organization, administration and community relations as they affect rural counties. (2S) **Staff**

230. **Social Psychiatry I.** Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; interrelation of physical, emotional, mental and environmental factors. (2W) **Staff**

231. **Social Psychiatry II.** An advanced course open only to students who have completed S.W. 230. (2S) **Lewis**

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

250. **Public Welfare Services I.** Development of the concept of public responsibility and its application in a modern public welfare services program; and historical development of various public welfare services. (3F') **Staff**

251. **Public Welfare Services II.** Analysis of the operation of a modern public welfare services program, including: public assistance, social security, public services for children. (3W) **Staff**
260. Medical Information. Diseases most frequently encountered in social work. Interrelations of disease and social conditions. Medical resources. (3W) Staff

270. Child Welfare. Evolution and current developments in programs for meeting needs of children. Consideration is given to substitute parental care and adoptions, to child labor laws, juvenile courts, to problems of the child of unmarried parents, and the handicapped and the exceptional child. (3S) Lewis

276. Contemporary Social Work Literature. Reviews current contributions to fields of social work literature and acquaints the student with the periodical literature published during the previous year. (2W) Staff

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

295-296. Seminar in Social Work. For advanced students in the Division of Social Work. Reviews the current trends and the recent literature of social work. (1-2S) Staff
SCHOOL OF EDUCATION

JOHN C. CARLISLE, Dean

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General Information

The School of Education, as an administrative unit of the College, includes the departments of Agricultural Education; Education; Fine Arts; Library Science; Health, Physical Education and Recreation; and Psychology. The department of Fine Arts provides for graduation majors in art, music and drama. Most of the other departments in the school of Education provide for similar variable majors. A primary function of all the departments, however, is the preparation of teachers, administrators, supervisors, and other professional personnel for the public schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments in the college.

The Bachelor of Science degree with a major in elementary or in secondary education is designed for students preparing to teach in elementary or in secondary schools. Students majoring in other departments of the College who wish to prepare for teaching are admitted to the teacher education curricula upon formal approval of their application by the Admissions Committee of the School of Education. Subsequently, they are assigned an adviser in education who cooperates with the adviser in the student’s departmental major.

The College offers complete programs of teacher education in all phases of public school work. Facilities for student teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Family Living and Child Development in the School of Home and Family Living, is especially concerned with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts, and Technology do their student teaching under the direction of the departments concerned in selected schools throughout the state and under supervision of College supervisors.

For the preparation of kindergarten and general elementary teachers, the College maintains a laboratory school, the Whittier School, which includes the kindergarten and grades one to six, inclusive. The teachers in the school, selected especially for their fitness to serve in the teacher education program, are regular members of the College faculty. The Whittier School, in addition to its function as a center for teacher education, serves the School of Education as a laboratory in which child growth and development are studied and desirable school practices are developed. A new campus laboratory school to be completed within the next year will take over the functions of the Whittier School.

Students preparing for general secondary certificates do their student teaching under the direct supervision of selected teachers in nearby junior and senior high schools. The College maintains contractual arrangements for these services. Students in elementary education also do part of their student teaching in selected public schools.

On the graduate level, as indicated in the subsequent statements concerning each department, programs are offered for students who desire to meet requirements for administrative, supervisory, or other advanced professional certificates. The M. S., the M. Ed., and the Ed. D. degrees are offered.

The School of Education is a member of the American Association of Colleges for Teacher Education.
DEPARTMENT OF EDUCATION

John C. Carlisle, Professor and Head of Department; Ellvert H. Himes, E. A. Jacobsen, L. G. Noble, Professors; Caseel D. Burke, Jefferson N. Eastmond, Basil C. Hansen, Edith S. Shaw, Associate Professors; Eldon M. Drake, Terrance E. Hatch, Pearl S. Budge, Assistant Professors; Ellen S. Humphrey, Myrtle R. Jensen, Beatrice E. Murray, Fern S. Nichols, Alice Olsen, Ivan Pedersen, Thomas Taylor, Instructors.

The Department of Education is organized into two main subdivisions—Teacher Education and Graduate Programs. Students may complete requirements and graduate with the Bachelor's degree in either elementary or secondary education. They are then eligible to receive either the elementary or secondary certificate in Utah, which in turn is recognized by most states requiring either the Bachelor's degree or less for these certificates.

At the graduate level, the department offers courses leading to the degrees Master of Education, Master of Science in Education, and the Doctor of Education, in the general areas of School Administration, Elementary Education, Secondary Education, and Vocational Education.

TEACHER PLACEMENT SERVICE

BASIL C. HANSEN, Chairman

The College is interested in placing qualified teachers in teaching positions. To accomplish this purpose, the teacher placement service has been organized. All students who qualify for teaching certificates are required to register with the bureau to facilitate the compilation of the proper credentials to be used in placement for the current and future years. Registration should be completed in the winter quarter or early part of the spring quarter.

TEACHER CERTIFICATION

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements for regular students of the College.

Certification standards conform as nearly as possible to the requirements of the State Board of Education. With the Bachelor's degree the student may qualify for any one of the following certificates:

- Teacher's Certificate for Kindergarten
- Teacher's Certificate for Elementary Schools
- Teacher's Certificate for Secondary Schools
- Librarian's Certificate for Elementary Schools
- Librarian's Certificate for Secondary Schools
- Provisional Counselor's Certificate
- Certificate for Secondary School Teachers of Vocational Agriculture
- Certificate for Secondary School Teachers of Industrial Arts
- Certificate for Teachers of Vocational Homemaking in Secondary Schools

Administrative Certificates granted by the State Board of Education may be earned by graduate students.

Specific requirements for each certificate may be obtained from the departments in which the major work is offered.
In order to coordinate and assist efforts in educational research, the School of Education maintains a Bureau of Educational Research and Service. The service and facilities of this Bureau are available for graduate students and faculty members. In addition, the Bureau is organized to render specialized services to public schools, and facilities of this Bureau are available to graduate students and others interested in educational research or service. Inquiries should be directed to the chairman in charge or to the dean of the School of Education.

DIVISION OF TEACHER EDUCATION

Caseel D. Burke, Chairman

The Division of Teacher Education offers programs of study leading to the Bachelor of Science degree in the fields of elementary and secondary education and to completion of certification requirements for teaching in the elementary and secondary schools of Utah. Students working toward the degree in either field should plan their courses of study with the guidance of their faculty advisers.

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 the following minimum requirements must be met:

1. Courses designed to provide a broad liberal background. These must include a minimum of ten credit hours in each of the four basic fields of knowledge: biological science, physical science and mathematics, language arts, and social science. In addition, six credit hours must be earned in the fine and/or practical arts.

2. Thirty credit hours in one field of concentration, or 18 credit hours in each of two such fields. These fields of concentration should be related as closely as possible to curriculum areas of the elementary school.

3. A major of 45 credit hours in professional study selected from the following divisions:

   Group I  Understanding the Child—Minimum, 9 credit hours:

   Group II Understanding the School—Minimum, 6 credit hours:

   Group III Curriculum and Methods—Minimum, 12 credit hours:

   Group IV Student Teaching—Minimum, 12 credit hours:
   Education 106*, Child Development 175.

   Group V Electives—May apply on 45-credit hour major:
   Education 110, 182, 205, Psychology 112, 140, 161.
   (Starred courses "*" are required.)
In planning his course of study, a student should be guided by his major professor.

A student who wishes to qualify for elementary certification in addition to completing his secondary requirements must have completed a minimum of fifteen (15) quarter hours of professional education courses specifically listed for elementary teachers including: Child Psychology (Psych. 105), Elementary School Curriculum (Educ. 104), Student Teaching (Educ. 106a), and additional courses selected from: Education 105, 107, 108, 109, Psychology 108, English 122, Speech 118, Music 150, Art 152, and Physical Education 182.

The Program in Secondary Education

In obtaining the Bachelor of Science degree in secondary education and to qualify for the Utah teacher's certificate for secondary schools the following minimum requirements must be met:

(1) Completion of the College Lower Division requirements, including those in the four basic groups—biological science, exact science, language and arts, and social science.

(2) Completion of a teaching major of not fewer than 36 credits, of which 15 credits must be Upper Division, and a teaching minor of 18 credits. The major and minor must each be in a specific subject taught in Utah secondary schools. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not fewer than 60 credits in two or more related subjects taught in secondary schools, with a minimum of 18 credits in any subject in the composite major. Lists of courses recommended for teaching majors, minors, and composite majors are available at the department office.

(3) Completion of a major of at least 36 credits of professional work in Education and Psychology, including the 33 credit hours required for the Utah teachers certificate for secondary schools. The professional courses are to be taken within the following divisions:

Group I Understanding the Pupil—Minimum, 9 credits:
Education 113, Psychology 102*, 105, 123, 140, 145, 202, Public Health 155*.

Group II Understanding the School—Minimum, 6 credits:
Education 111, 114*, 116, 141.

Group III Student Teaching, Methods & Curriculum—minimum, 15 credits:
Education 111*, 215, 127*, 129*, 130*, 161. A maximum of 5 credits in the following special methods classes may be counted in completing the 15 credit requirement in this Group or the total of 33 credits in professional courses, if taken in the field of one's teaching major or minor: Art 151, English 123, Music 131 or 132, Speech 123, Secretarial Science 179 or 180, Physical Education 120, 130, 160, 163, Mathematics 150.

Group IV Electives—may apply toward 36 credit major:
Education 182, 202, Psychology 112, 127, 161.

Students majoring in other departments of the College which offer teaching majors in general secondary education must complete the requirements outlined above except that the requirement in Education, Psychology and School Health totals 33 credits for Utah certification instead of 36 for the secondary major. Such students are advised to apply to the Department of Education for admission to the teacher education program as early as possible in their college careers.

10. College and Life. Orientation course for freshmen but open to all students. (2F, W or S)
50. Introduction to Teaching. Study of qualifications essential to teaching success and to each student's aptitudes for teaching. Required of all candidates for teaching training curricula. (2F, W, S) Staff

103. Principles of Elementary Education. Aims, functions, work and attainable goals of the elementary school as an integral part of the American school system of education. Part of the work of the course is observation and analysis of practices and procedures in selected elementary schools near the College. (4F, W, S) Burke

104. Elementary School Curriculum. Familiarizes prospective elementary 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 subjects of the curriculum. (3F, W, S) Hansen

105. Principles of Teaching in the Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. Significance of individual differences in application to schoolroom practices. Consideration of classroom organization, equipment, and play activities. To be taken concurrently with student teaching. (3F, W, S) Shaw

106. Student Teaching in the Elementary School. For juniors and seniors who have had a substantial amount of professional course work including Educational Psychology and Principles of Education. 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. Registration for all quarters should be arranged at fall quarter registration. 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. (12 F, W, S) Shaw and Supervising Teachers

107. Teaching of Reading. Considers the objectives of the reading program, stages of reading development, skills and attitudes to be gained, the materials of instruction, and the experiences of children that contribute to the achievement of the objectives of reading. (3F) Shaw

108. Social Studies in the Elementary School. Social responsibilities and opportunities of youth in the modern world. Emphasizing the part played by the school and the teacher in helping children meet problems of living. Content and methods on both elementary and secondary levels. (3W) Burke

109. Arithmetic and Science in the Elementary Grades. Investigation of the aims of the arithmetic and science programs and an acquaintance with the materials, techniques of instruction, and experiences that may help children gain the skills, understandings, and attitudes desirable in these subject areas. (3S) Burke

110. Diagnostic and Remedial Teaching. Specific objectives of the elementary school and methods of analyzing the extent to which these objectives are reached. Diagnostic and remedial measures with respect to various areas of the curriculum. (3S) Hansen

111. Principles of Secondary Education. The background and status of the American secondary school. Problems concerning desirable objectives and functions are analyzed. An introduction to various type curricula and methods is included. (5F, W, S) Carlisle and Drake

113. Principles of Guidance. Major emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W, S) Hatch

114. Organization and Administration. Fundamental principles of operating public schools, with emphasis on Utah conditions. (3F, W, S) Eastmond
116. Articulation of the Educational Program. A survey of existing needs for close articulation of the various educational units and agencies. Discussion of factors conditioning nature, and extent of articulation and of the unifying principles upon which a well-articulated education program rests. (3F) Jacobsen

118. Social Studies In the Secondary School. A special methods course for secondary school teachers with teaching majors or minors in any of the social sciences. (3F) Budge

119. Extra-curricular Activities. Designed to acquaint prospective teachers and administrators with extra-curricular programs in secondary schools, and the place such activities occupy. (2W) Drake

124. The Teaching of English. This course considers what research says about methods of teaching English and what the content of the language arts program should be. It also includes a review of some fundamentals. (4W) Budge

127. Secondary School Methods. Teacher personality, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, testing and evaluation, are all included. Recommended to be taken the same quarter with Education 129. (3F, W, S) Budge, Hatch

129. Student Teaching in the Secondary School. This course must be taken during the same quarter as Education 127 and should be taken concurrently with Education 130, thus making a block of eleven credits to be completed in one quarter. The student should reserve all morning or all afternoon in his daily schedule for these courses. Application for admission to student teaching is made the preceding quarter, and students may enroll only if their application has been approved. Applications will be approved only if the student has completed Education 111 and Psychology 102. Members of the class are assigned to a sponsor teacher in nearby secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until upon completion of the quarter, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. (4F, W, S) Hatch, Pease, Budge

130. Student Teaching in the Secondary School. See 129 above. (4F, W, S) Hatch, Pease, Budge

131. Student Teaching. Student teaching at the junior college level. Designed for graduate assistants, laboratory instructors and others desiring to enroll for credit. Five hours weekly in student teaching plus one weekly seminar arranged. (4W) Jacobsen

138. Improvement of Teaching in Secondary Schools. Designed to meet the needs of teachers, supervisors, and administrators. Emphasis upon recent developments in the improvement of teaching learning situations and activities from the junior high school to the junior college with special attention to core curriculum. (3S) Budge

141. Social Foundations of Education. The implications for education involved in social conditions and social change. The social significance of current educational theories and practices. (3W) Hansen

161. Audio-Visual Aids in Education. Studies the building of a workable program in which the newest materials and techniques are utilized. (3F, W, S) Drake

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

Special methods courses in Secondary Education.

—Teaching of Typewriting and Bookkeeping. (See Secretarial Science 179)

—Teaching of Shorthand. (See Secretarial Science 180)

—Teaching of Mathematics. (See Mathematics 150)

—Teaching of Physical Education. (See special methods courses in Physical Education.)

—Teaching of Art. (See Art 152)
GRADUATE PROGRAMS IN EDUCATION
(Administration, Elementary, Secondary)

Requirements for graduate degrees in Education are included with the statement of the Graduate School on page 58. Detailed descriptions of the programs of study leading to these degrees are available at the office of either the Dean of the Graduate School or Dean of the School of Education.


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

204. Elementary School Curriculum. An advanced course in elementary school curriculum for graduate students including experienced teachers, supervisors, and administrators. (3W) Burke

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

207. Elementary School Administration. The operation and management of the modern elementary school. (3F) Burke

208. School Supervision. The principles and practices of school supervision including the qualifications and responsibilities of supervisors. (3S) Staff


213. Organization and Administration of Guidance. (See Psychology 213). Staff

215. Secondary School Curriculum. A study of the secondary school curriculum, junior and senior high school, as it now exists in typical schools, with special reference to Utah. (3F) Staff

217. The Junior High School. A study of the junior high school as a distinct segment of the American public school system, its functions, organization and curriculum with special emphasis upon the core curriculum and common learnings. (3F) Hatch

218. Public Relations in Education. Objectives and techniques and media for an improved school public relations program are listed and evaluated. (3F) Jacobsen

221. School Administration. The work of the school administrator and the principles upon which the profession of school administration is practiced. Federal, state, and local relations to education are studied. (3F) Eastmond

222. Administration of School Personnel. Principles and practices in management of teacher and pupil personnel. (3S) Jacobsen

236. Secondary School Administration. Topics in secondary school administration are considered, 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 certificate in secondary education. (3W) Carlisle

237. Problems in Secondary Education. For graduate students in secondary education and those preparing for school administration or supervision in the junior or senior high schools. Reviews current research in areas of special interest to class members. (3F) Hatch

245. Problems in Elementary Education. Consideration given those fields of elementary education that members of the class desire to investigate in order to gain modern authoritative viewpoints. Opportunity for both individual and group work. (3S) Burke
247, 248, 249. Education Seminar. Opportunity for investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. (1F, W or S) Staff

267. Introduction to Research. An inquiry into the nature and sources of research problems with a study of underlying principles and methods of working out such problems in education. Some attention is given thesis writing as a problem related to research. (3F) Carlisle

271. Research and Thesis Writing. Individual work in thesis writing with necessary guidance and criticism. Credit arranged. (F, W or S) Staff

275. Field Studies and Thesis. Individual work on research problems applying on the program of the Ed.D. Credit arranged. (F, W, S) Staff

281. School Finance. The importance of finances in a school system; principles and practices involved in collecting and distributing school revenues, with special reference to conditions in Utah. (3F) Eastmond

299. Internship in School Administration. The course provides introductory experiences in school administration. The student will be assigned for a minimum of five hours weekly to work under the direction of an administrator in the public schools, either elementary or secondary, according to the student's goal. (F, W, S) Credit to be arranged. Staff

302. Readings in Foundations of Education. The course will deal with current problems of education in terms of their sociological, historical, and philosophical foundations. For advanced graduate students. Enrollment on consent of the instructor. (3S) Jacobsen


323. Legal Aspects of School Administration. Emphasis is given to responsibilities and functions of local and district school administrators with interpretation of legal status, form and procedure as established by statutes, legal opinions, and court decisions. (3W) Eastmond

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 provision governing financing and construction of new buildings, bids and contracts. (3S) Eastmond

HEALTH, PHYSICAL EDUCATION AND RECREATION

H. B. Hunsaker, Professor and Head of Department; Lois Downs, J. M. Pease, Associate Professors; Dale O. Nelson, Ray Watters, Pauline Fuller, Roxie Diver, Assistant Professors; Ned Stringham, Arthur Mendini, Instructors.

INTERCOLLEGIATE ATHLETIC STAFF

H. B. Hunsaker, Professor and Director of Athletics; Cecil Baker, Head Basketball Coach, Associate Professor; Everette Faunce, Head Football Coach, and Ralph Maughan, Assistant Football Coach, Assistant Professors; George Nelson, Trainer, Jack Nelson, Assistant Football Coach, Evan Sorenson, Freshman Coach, and Dale Gardner, Administrative Assistant, Instructors.

ACTIVITY COURSES

In the activity courses opportunity is given each student to develop skills in some physical activity that will help establish a permanent interest in healthful recreation, both active and passive, the promotion of physical fitness, the building of morale, and the maintenance of health.
A physical examination is given each student at the beginning of each year to advise him properly about the type of activity best suited to his individual needs.

Women students are required to take physical education activity courses for six quarters. Classes may be selected by the student; no course may be repeated for credit. A student must satisfactorily complete an elementary course or have the permission of the instructor before she can enroll in an intermediate or advanced activity course.

All male students should take some activity courses in Physical Education. Numerous courses in aquatics, dual, team, individual and outing activities are offered each quarter.

**INTRAMURAL ACTIVITIES**

Intramural activities are conducted as part of the program of the Department of Health, Physical Education and Recreation. The intramural program is planned to give every student moral, social, physical, and educational values derived from competitive activities. This program provides for both individual and team endeavor and every attempt is made by the department to make possible for all students to participate.

The Women's Intramural Association, in cooperation with the Women's Division of the department, offers a widely varied program of activities. All women students are eligible and encouraged to participate in any or all of the activities offered during the year.

The department offers an extensive organized intramural sports program for men. Competition in a variety of activities is carried on in separate leagues; fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues.

**RECREATION**

The Department of Health, Physical Education and Recreation aims to meet the recreational needs and interests of every student, whether he is pursuing a course of study in agriculture, engineering, business, or other professional activity. The purposes of these activities are the development of a love of wholesome recreation and sufficient skills so that the students will continue to participate with satisfaction and enjoyment in various recreation activities after they become members of a community. Clubs are organized in a variety of activities so that the above purposes may be realized. These clubs include hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and square dancing.

**PROFESSIONAL PREPARATION IN HEALTH, PHYSICAL EDUCATION AND RECREATION**

In the department of Health, Physical Education and Recreation students may specialize in the following areas: Physical Education, Elementary Physical Education, Secondary Physical Education Certification, Recreation, Health, Dance, Professional Scouting, and Physical Therapy. A composite major including two of the above areas may be taken to meet the major-minor requirement. Selection of a program of study in these areas should be carefully worked out under the guidance of the student's adviser. The following courses, in addition to the six credits required for graduation, are suggested for each of the above areas:

Non-certifying Physical Education Majors should complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 83, 84, 85 or 92, 106, 107, 108, 183; six credits in Sports Techniques, and ten credits of approved electives.

Elementary Physical Education Majors should complete Physical Education 24, 55, 75, 81, 83, 84, 85 or 92, 108, 120, 177, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.
### Secondary Physical Education Men Majors should complete the following:

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<td>Group Req.</td>
<td>10 5 5</td>
</tr>
<tr>
<td></td>
<td>16 16 16</td>
<td></td>
<td>Electives</td>
<td>2 2 2</td>
</tr>
</tbody>
</table>

### Secondary Physical Education Women Majors should complete the following:

<table>
<thead>
<tr>
<th></th>
<th>Freshman</th>
<th></th>
<th>Sophomore</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>F W S</td>
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<td>F W S</td>
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<tr>
<td>P.E. *120, 121, 122</td>
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<td>P.E. 130, 131, *132</td>
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<td>2 2 2</td>
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<td>P.E. 183</td>
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<tr>
<td>P.E. 106, 107, 108</td>
<td>3 3 3</td>
<td></td>
<td>P.E. 192</td>
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<td>Ed. 111</td>
<td>3</td>
<td></td>
<td>P.E. 184</td>
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<tr>
<td>Psy. 102</td>
<td>5</td>
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<td>PH 155</td>
<td>3</td>
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<tr>
<td>Ed. 114</td>
<td>3 3 3</td>
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<td>Ed. 127</td>
<td>3</td>
</tr>
<tr>
<td>Minor</td>
<td>4 2 4</td>
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<td>Ed. 129</td>
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</tr>
<tr>
<td>Electives</td>
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<td>Ed. 130</td>
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<tr>
<td></td>
<td>17 17 17</td>
<td></td>
<td>Minor</td>
<td>6 3</td>
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<td></td>
<td>Elective</td>
<td>3 8</td>
</tr>
<tr>
<td></td>
<td>17 16 16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Courses taught more than one quarter each year.*
Recreation Majors should complete Physical Education 3, 17A, 18, 74, 75, 83, 84, 85, 153, 157, 179, 183, 196; three credits in Sports Fundamentals, four credits in crafts, music, drama, and photography.

Health Education Majors should complete Physical Education 55, 84, 108, 145, 183, 184; Public Health, 15, 50, 151, 152, 153, 156, and Psychology 145 or Sociology 162 or Social Work 165, and 12 credits from approved electives.

Dance Majors should complete Physical Education 72, 76, 81, 83, 84, 102, 103, 104, 106, 107, 108, 111, 140, 150, 151, 153, 183, 184, and six credits of approved electives.

Students planning to go onto a Physical Therapy School should complete Physical Education 17A, 18, 55, 74, 75, 83, 106, 107, 108, 183; four credits in Sports Fundamentals and four credits in Sports Techniques, and 12 hours from approved electives. Physical Therapy students should work closely with the advisor in selecting courses to fill groups and minor requirements.

MASTER OF SCIENCE DEGREE IN PHYSICAL EDUCATION

The Department of Health, Physical Education and Recreation offers courses leading to the Master of Science degree in 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 Utah State Agricultural College and additional requirements as prescribed by the graduate school. Required courses are: P.E. 192, 250, 271, 295, 299. Ed. 267, Eng. 211.

Students entering the department for graduate study should select supporting fields from one or two other areas of the school, closely allied to physical education and recreation. Students should elect graduate courses from the areas selected. Suggested areas and courses are:

- Education 201, 211, 219, 221, 230, 237.
- Health 160, 166, Bact. 144, 151, 156, 168, 201.
- Psychology 107, 110, 140.

ACTIVITY COURSES FOR MEN

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Freshman Football</td>
<td>Sorenson</td>
</tr>
<tr>
<td>4. Boxing (1F, 1W, 1S)</td>
<td>G. Nelson</td>
</tr>
<tr>
<td>5. Boxing (Advanced)</td>
<td>G. Nelson</td>
</tr>
<tr>
<td>6. Football (1W)</td>
<td>Faunce</td>
</tr>
<tr>
<td>7. Wrestling (1F, 1W)</td>
<td>G. Nelson</td>
</tr>
<tr>
<td>8. Wrestling (Advanced) (1F, 1W, 1S)</td>
<td>G. Nelson</td>
</tr>
<tr>
<td>12. Track (1S)</td>
<td>Maughan</td>
</tr>
<tr>
<td>15. Softball (1S)</td>
<td>Staff</td>
</tr>
<tr>
<td>16. Swimming (1F, 1W)</td>
<td>Staff</td>
</tr>
<tr>
<td>17. Swimming (Intermediate) (1F, 1W, 1S)</td>
<td>Staff</td>
</tr>
<tr>
<td>23. Basketball (1F, 1W, 1S)</td>
<td>Baker</td>
</tr>
<tr>
<td>26, 27, 28. Individual Physical Education</td>
<td>Faunce</td>
</tr>
<tr>
<td>29. Varsity Football</td>
<td>Staff</td>
</tr>
<tr>
<td>34. Soccer (1F)</td>
<td>Stringham</td>
</tr>
<tr>
<td>35. Volley Ball (1W)</td>
<td>Stringham</td>
</tr>
<tr>
<td>37. Trampoline (1F, 1S)</td>
<td>Stringham</td>
</tr>
<tr>
<td>38. Tumbling and Gymnastics (1W)</td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY COURSES FOR WOMEN

39. Soccer-Speed Ball (1F)
40. Volleyball (1F, 1W)
41. Basketball (1W)
42. Softball (1S)
43. Field Hockey (1S)
44. Tumbling and Stunts (1W, 1S)
45, 46, 47. Individual Physical Education. A Program designed to meet
the needs of individuals who are unable to participate in the required program
of Physical Education. Students must obtain permission of the head of the
department before registering. (1F, 1W, 1S)
52. Swimming (1F, 1W, 1S)
56. Swimming (Intermediate) 1F, 1W or 1S)
55. Rifle (1W)
60. Body Conditioning (1F, 1W, 1S)
152. Synchronized Swimming (1F)

ACTIVITY COURSES FOR MEN AND WOMEN

1. Hiking (1F, 1S)
3. Skiing (1W)
9. Fencing (1F, 1W, 1S)
13. Bowling (1F, 1W, 1S)
18. Swimming (Advanced) (1F, 1W, 1S)
19. Skiing (Intermediate) (1W)
48. Modern Dance (1F, 1W)
49. Modern Dance (Intermediate) (1W, 1S)
61. Archery (1F, 1W, 1S)
66. Badminton (1F, 1W, 1S)
67. Tennis (1F, 1S)
68. Folk Dance (1F, 1W)
70. Tap Dancing (1F, 1W, 1S)
71. Tap Dancing (Intermediate) (1F, 1W)
72. Social Dancing (1F, 1W, 1S)
73. Golf (1F, 1S)
74. Life Saving. Prerequisites: Red Cross Swimmers Card or permission
of instructor. American Red Cross Certification is given to students who
pass the examination. (2F, 2W)
76. Social Dance (Advanced) (1F, 1S)
90. Tennis (Intermediate) (1S)
136. Golf (Advanced) (1S)
141. Modern Dance (Advanced) (1W, 1S)
155. Diving. Prerequisite: PE MW 18 (1S)
161. Archery (Advanced) (1W, 1S)
166. Badminton (Advanced) (1F, 1W, 1S)
167. Tennis (Advanced) (1S)
168. Square Dancing (1F, 1W, 1S)

PROFESSIONAL COURSES

17A. Swimming. For screening of all freshmen and transfer students
majoring in Physical Education. (1F, 1W)
20. Fundamentals of Sports. A professional course designed to develop
the fundamental skills of Tennis and Archery. (1F) Taught alternate years.
21. Fundamentals of Sports. A professional course designed to develop
the fundamental skills of Social and Square Dancing. (1W) Taught alternate
years.
22. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Badminton and Golf. (1S) Taught alternate years. Staff

24. Dance Laboratory. Folk dancing for freshman and sophomore women majoring or minoring in physical education. (1F) Taught alternate years. Fuller

26. Dance Laboratory. Tap Dancing for freshman and sophomore women majoring or minoring in physical education. (1S) Taught alternate years. Fuller

30. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Boxing and Wrestling. (1F) Taught alternate years. (Not taught 1956-57) Staff

31. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Tumbling, Gymnastics and Trampoline. (1W) Taught alternate years. (Not taught 1956-57) Staff

32. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Volleyball and Speedball. (1S) Taught alternate years. (Not taught 1956-57) Staff

55. First Aid. Standard American National Red Cross course in first aid with emphasis on practical use of the knowledge as applied to everyday life in various occupations. Detailed demonstrations and practice. American Red Cross First Aid certificate may be obtained by students who pass a satisfactory examination. (3F, 3W) Staff

57. Introduction to Physical Education. An introduction to the historical background, philosophy, theory and practice in Physical Education. (2F) Staff

75. Introduction to Physical Education. An introduction to the historical background, philosophy, theory and practice in Physical Education. (2F) Staff

77. Dance Laboratory. Techniques of Elementary Modern Dance for freshman and sophomore women majoring or minoring in Physical Education. (1F) Taught alternate years. (Not taught 1956-57) Fuller

78. Dance Laboratory. Techniques of Intermediate Modern Dance for freshman and sophomore women majoring or minoring in Physical Education. (1W) Taught alternate years. (Not taught 1956-57) Fuller

79. Dance Laboratory. Techniques of Advanced Modern Dance for freshman and sophomore women majoring or minoring in Physical Education. (1S) Taught alternate years. (Not taught 1956-57) Fuller

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

83. Playground and Community Recreation Leadership. Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (3S) Staff

84. Problems in Physical Growth. The individual is traced through the various stages of development with special emphasis on the physical aspects of growth. Principles and function of activity is applied. (3S) D. Nelson

85. Organization of Intramural Sports. Organization and administration of intramural sports in secondary schools. Sports, tournaments, units of competition, scoring systems, and co-ordination of intramural sports with physical education and athletics are considered. (3F) Watters

86. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating football, touch football, basketball, wrestling and boxing. Attention also is given to the proper instruction of other game officials such as timers, scorers and game administrators. (2F) Watters

87. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating volleyball, ski meets, water basketball, badminton and softball. The techniques of officiating basketball are reviewed. Attention also is given to the proper instruction of other game officials such as timers, scorers and game administrators. (2W) Watters

92. Organization of Intramural Programs for Women. Organization of sports days, play days, tournaments, and administration of intramural activities for women. (3W) Downs
93. Sports Officiating for Women. Techniques of officiating, knowledge of rules, and practical experience in officiating. (2F) Staff

94. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of soccer-speedball and volleyball. (1F) Taught alternate years. (Not taught 1956-57) Downs

95. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of basketball and basketball officiating. (1W) Taught alternate years. (Not taught 1956-57) Downs

96. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of softball and field hockey. (1S) Taught alternate years. (Not taught 1956-57) Downs

98. Physical Education Laboratory. Fundamentals of individual sports for lower division women majoring or minoring physical education. (1S) Taught alternate years.

102. Dance Composition. Composition based upon the special elements of direction, level, and dimension. Experience in composing for an individual and for group. (2F) Fuller

103. Dance Composition. Composition based upon the following musical forms: AB, Rondo, Theme, and Variation, Canon and Round, Dance Suite. (2W) Fuller

104. Dance Production. Composition done independently and participation in a performance required: lighting, staging, costume and make-up applied to a dance concert. (2S) Fuller

106. Scientific Foundations of Physical Education. "Basically" a study of Kinesiology which is the science of movement. The course 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 on principles of good body mechanics; and accepted methods of using and developing the human body. (3F) D. Nelson

107. Scientific Foundations of Physical Education. "Basically" a study of the physiological functions of the human body in various types of activity. The course includes a detailed study of the physiological changes that take place during all kinds of activity. The application of physiological principles are then applied to physical education. (3W) D. Nelson

108. Scientific Foundations of Physical Education. "Basically" a study of the adapted physical education program. The course includes the administration of a corrective physical education program in addition to a study of abnormal problems in body mechanics, Athletic injuries and their treatment, Athletic training procedures, and principles dealing with abnormal conditions found in the physical education program. (3S) D. Nelson

111. Creative Rhythms for Schools. Methods and materials used in guiding creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W) Fuller

113. Construction of Physical Education Equipment. Construction of and practice in the use of rhythmic instruments and play equipment. (3S) Staff

120. Methods in Physical Education. A study of theories of learning and their practical application to the teaching of physical education. Open to men and women. (2F) Staff

121. Techniques in Physical Education. A professional course designed to develop teaching techniques in social and square dance. Open to men and women. (2W) Taught alternate years. Staff

122. Techniques in Physical Education. A professional course designed to develop teaching techniques in tennis and badminton. Open to men and women. (2S) Taught alternate years. Staff

124. Scoutmaster's Basic Training Experience. The standard training course approved by the National Council and includes the following: Plans and methods, fundamentals, organization and leadership, program planning, meetings, hiking, and camping. (2S) Staff

130. Technique in Physical Education. A professional course designed to develop teaching techniques in boxing and wrestling. (2W) Taught Alternate years. Not taught 56-57) Staff
131. Technique in Physical Education. A professional course designed to develop teaching techniques in gymnastics, tumbling, trampoline and speed-ball. (2S) Taught alternate years. (Not taught 1956-57)

132. Water safety Instructor’s Course. Prerequisite: American Red Cross Junior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life-saving and use of small water crafts. Proper American Red Cross certification is given students who pass the examination. (2W, 2S)

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. (2S)

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)

145. Alcoholism and Education. The alcohol problem is considered from the physiological, psychological, sociological, educational, historical, and legal aspects. The development of a correlated attack on the problem is emphasized. (3S)

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

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

153. Leadership in Dance. An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing is prerequisite. A syllabus is required. (2S)

157. Social Recreation Leadership. Practical experience in conducting social recreation activities by planning and conducting social recreation evenings for church, school and civic groups. Prerequisite: P.E. 83. Time and credit arranged. (F, W, or S)

160. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in soccer, speedball and volleyball. (2F) Taught alternate years. (Not taught 1956-57)

161. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in basketball. Consideration is also given to officiating basketball. (2W) Taught alternate years. (Not taught 1956-57)

162. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in softball and field hockey. (2S) Taught alternate years. (Not taught 1956-57)

165. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in stunts and tumbling. (2S) Taught alternate years.

177. Physical Education in the Elementary School. Characteristics of the growth and development of the elementary school child with special reference to his needs in social and physical development which can be aided through physical activities. (3F)

179. Camping and Camp Craft. Training in camp technique and camp leadership. Different types of camps and their organization, supervision, equipment and safety are considered. Several short hikes and an overnight camp are conducted during the course. Each class member is expected to participate in these hikes. (2S)

182. Material and Methods of Elementary School Physical Education. Practical experience in, participation in, and direction of activities in the well balanced physical education program. Students teach at all grade levels in local elementary schools. (3W, 2S)

183. Interpretation of Physical Education Objectives. Results and values of physical education activities under leadership in terms of development, adjustment and standards, and their relationships as objectives. (8F)
184. Administration of Physical Education. Administration procedures in the conduct of physical education in the high school; curriculum construction and program planning. (3S) Hunsaker

188. Methods in Football. Fundamentals of football, theory and practice, details of each position on the team, training, and managing, complete technique of developing offensive and defensive tactics. (2W) Faunce

189. Methods in Basketball. Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; methods of defense and offense. (2F) Baker

190. Methods in Baseball and Track. The course is taught in two distinctive phases. (a) Fundamentals in track and field, training and the conduct of athletic meets. (b) Fundamentals of baseball, team play, training and strategy. (2S) Staff

191. Interpretation of the Health Examination. Examination procedures, the detection of physical defects, the general assessment of the health of the individual and the follow up program. (3S) Staff

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

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

196. Organization of Recreation. Problems of organization and administration of community recreation departments, including staff, facilities, program of activities and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school co-operation in a united recreation program. (3S) Pease

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

271. Research and Thesis Writing. Credit arranged. Hunsaker

295. Problems in Physical Education. (3F, 3W, 3S) Pease

299. Physical Education Seminar. (F, W, S) Credit arranged Pease

Fine Arts

Professor and Head of Department

The Department of Fine Arts, comprising the Divisions of Drama, Music, and Visual Arts, has a three-fold purpose. It is designed to offer rewarding contact with the arts to the college and community at large through experience as viewers, listeners or participants in a variety of exhibitions, dramas and concerts. It serves to prepare students as teachers of the arts in the elementary and secondary schools, and as participants in other professional endeavors in the field of fine and applied arts. Graduate studies, designed both to deepen artistic insight and to facilitate the professional application of technic are available.

The Division of Visual Arts

Floyd V. Cornaby, H. Reuben Reynolds, Professors; Jessie Larson, Everett Thorpe, Associate Professors; Harrison Groutage, Assistant Professor.

The Division of Art serves three functions:

a. To the student body in general it offers:

1. The following courses which meet Group Requirements in the field of Language and Arts: Art 7, 30, 31, 32, 33, 34 and 40.

2. Elective courses designed to increase appreciation of art and to satisfy avocational interests in the field: Art 1, 4, 7, 30, 31, 32, 33, 34, 40, 50, 106, 109, 110, 111, 112, 115, 116, 117, 118, 135 and 160.
b. The Division offers service courses to other schools, departments and divisions of the College, particularly to majors in Home Economics, Industrial Design and Landscape Architecture. Advisors in those fields should direct their majors to appropriate courses.

c. The Division offers majors in Art Education or in Applied Art. In the field of Art Education majors and minors may select specialization in Elementary Art or Secondary Art. In the field of Applied Art they may select specialization in Commercial Art, Crafts, Drawing and Painting; General Art or Interior Decoration. Majors in Art Education must choose a minor in a department other than Art. (This is also recommended for majors in Applied Art.)

The Division of Art reserves the right to retain student work for temporary or permanent exhibition.

Graduate Study: Provision is made through the Department of Fine Arts for study leading to a Master's Degree.

**CURRICULUM**

The following course of study is suggested for the first two years for all Art majors.

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Basic Comp.</th>
<th>Biological, Exact or Social</th>
<th>Art or Military</th>
<th>P. E. or Military</th>
<th>Science</th>
<th>Electives</th>
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</thead>
<tbody>
<tr>
<td>Fall</td>
<td>(Eng. 1) 3</td>
<td>biological, exact or social</td>
<td>Art 1, 3, 4 or 7 3</td>
<td>P. E. or Military</td>
<td>1</td>
<td>3 to 5</td>
</tr>
<tr>
<td>Winter</td>
<td>(Eng. 2) 3</td>
<td>biological, exact or social</td>
<td>Art 1, 2, 4 or 5 3</td>
<td>P. E. or Military</td>
<td>Science 1</td>
<td>1</td>
</tr>
<tr>
<td>Spring</td>
<td>(Eng. 3) 3</td>
<td>Language and Arts 3 or 5</td>
<td>Art 2, 3, 5 or 7 3</td>
<td>P. E. or Military</td>
<td>Science 1</td>
<td>Electives 0 to 3</td>
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**SECOND YEAR**

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<th>Quarter</th>
<th>Basic Comp.</th>
<th>Biological, Exact or Social</th>
<th>Art or Military</th>
<th>P. E. or Military</th>
<th>Science</th>
<th>Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>(Eng. 1) 3</td>
<td>biological, exact or social</td>
<td>Art 1, 3, 4 or 7 3</td>
<td>P. E. or Military</td>
<td>Science 1</td>
<td>1</td>
</tr>
<tr>
<td>Winter</td>
<td>(Eng. 2) 3</td>
<td>biological, exact or social</td>
<td>Art 1, 2, 4 or 5 3</td>
<td>P. E. or Military</td>
<td>Science 1</td>
<td>Electives 1 to 3</td>
</tr>
<tr>
<td>Spring</td>
<td>(Eng. 3) 3</td>
<td>Language and Arts 3 or 5</td>
<td>Art 2, 3, 5, or 7 3</td>
<td>P. E. or Military</td>
<td>Science 1</td>
<td>Electives 0 to 3</td>
</tr>
</tbody>
</table>

Art 1, 2, 3, 4, 5 and 7 are basic courses and should normally be completed before upper division work is undertaken. Upper division courses in Art with the exception of Art 101, 106, 125, 140, 151 and 152 may be repeated up to a total of three quarters, the letters a, b, c after the course numbers indicate the proper sequence. Credit in each major must total a minimum of 60 hours.

*See page 50 for a description of Group Requirements.

*This course is not required of majors in Applied Art.

Additional Requirements for the Two Majors and the Various Specializations: Art Education:

Courses in Education necessary to meet state requirements for certification: Art 40, 120a, 160a, 151 or 152, 101, 125a, 105a, 104a. Crafts—6 hours.
Painting—6 hours. Appreciation—6 hours; requirements for the minor (see page 50); electives (see page 51).

In the various specializations on the Major in Applied Art requirements for the minor (see page 51) and for electives (see page 51) must be met in addition to the art courses listed.

**Commercial Art:**
- Art 6, 120a, b, 101, 106, 121 a, b, 125a, 135. Salesmanship 63. Painting—9 hours. Appreciation—3 hours.

**Crafts:**
- Art 120a, 160a, 101, 105a, 115 (3 to 9 hours), 116 (3 to 9 hours), 117 (3 to 9 hours), 118 (3 to 9 hours). Appreciation—3 hours. Landscape Architecture 20 and Wood Work 61A.

**Drawing and Painting:**
- Art 6, 12, 32 or 34, 101, 104a, 105a, 106, 135 and Painting—15 hours.

**General Art:**
- Art 120a, 31, 40, 160a, 101, 125a, 135. Crafts (6 to 12 hours). History and Appreciation of Painting (3 to 9 hours). Painting (6 to 12 hours).

**Interior Decoration:**
- Art 120a, 31, 40, 115a, 135, 140, 141a. History and Appreciation of Painting—3 hours. Clothing Textiles and Related Arts 24 and 33. Household Administration 65, Landscape Architecture 20 (Landscape Architecture 20 is recommended as an elective), Salesmanship 63. Wood Finishing 170.

**ART EDUCATION**

50. **Art for Young Children.** Designed to meet needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3F)

Staff

151. **Art Methods for Elementary Grades.** Methods of teaching drawing, painting, design and handwork in the elementary schools. Required for preparation of a grade school teacher. Prerequisite: Art 1 and 2 or 7. (3W)

Reynolds

152. **Art Education 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. Prerequisites: Art 1 and 2 or 7. (3W)

Larson

**ART HISTORY AND APPRECIATION**

30. **Art Understanding and Appreciation.** Aims to increase enjoyment of living through the sense of sight. Develops understanding of basic principles underlying the visible forms of art in everyday life. (3F, S)

Reynolds

31. **History and Appreciation of Architecture.** Stone Henge to Contemporary—characteristics of the great styles of building and the development of a taste for good architecture. (3F)

Reynolds

32. **History and Appreciation of Painting.** Prehistoric, Egyptian, Greek to 18th Century. (3W)

Reynolds

33. **History and Appreciation of Painting.** French Revolution to the present. (3S)

Cornaby

35. **Art History of Western Hemisphere.** Indian cultures of Latin America. Spanish Colonial contribution and contemporary developments in painting, sculpture and architecture. (3W)

Cornaby

135. **Color.** Color used in stage lighting, painting, design, and every-day life. Physical, psychological, and artistic phases are correlated. Suited to the businessman, layman, dramatist, artist, teacher, and painter alike. (3F)

Reynolds

**COMMERCIAL AND GRAPHIC ART**

120abc. **Lettering-Layout.** Elementary and advanced pen and brush lettering. (3F, W, S)
121abc. Advertising Design and Illustration. Elementary and Advanced Fashion Illustration, art for reproduction, advertising layouts, techniques and skill in any media that will prepare the student for a professional career. (3F, W, S) Thorpe and Groutage

125abc. Print Making. Such methods as block printing, wood cuts, silk screen, and etching are studied. Desirable preparation, Art 4. (3S) Groutage

CRAFTS

115abc. Fabric Design and Its Application. Projects in creating designs of character and beauty and applying them to suitable textiles in techniques of block print, stencil, hooked rug, creative embroidery, silk screen printing, freehand painting, and batik. Desired prerequisites: Art 1 and 2. (3S) Larson

116abc. Ceramics. Art of making pottery, tiles, figurines. (3F, W) Groutage

117abc. Art Metal, Jewelry and Lapidary. Art metal projects in hand-wrought copper, and silver, jewelry design and construction, precision casting. (3F, W, S) Cornaby

118abc. Leathercraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (3F, W or S) Cornaby

DESIGN—STRUCTURE AND ORGANIZATION

1. Art Structure and Design. Creative approach to line, mass, form, pattern, texture, color, and their combined relationship to design construction. (3F, W) Cornaby, Reynolds, Thorpe

2. Design and Color. Design construction with special attention to a basic study of color. (Prerequisite: Art 1) (3W, S) Reynolds

3. Design Application. Problems in creating designs for application to specific projects. (Prerequisites: Art 1 and 2) (3F, S) Reynolds, Thorpe

101. Advanced Design. A continuation of Art 3 involving more advanced problems, with emphasis on their application to various industries, crafts and to advertising. (Prerequisites: Art 1, 2, and 3) (3F) Staff

DRAWING AND PAINTING

4. Basic Drawing. Objective drawing of natural forms from observation and memory in various media. A desirable prerequisite to all painting courses. (3F, W) Groutage and Larson

5. Intermediate Drawing. A continuation of basic drawing. (3W, S) Groutage and Thorpe

6. Anatomy for Artists. Analysis of bone and muscular structure of the body with emphasis on surface characteristics. (3F) Groutage

104abc. Life Drawing. From anatomical rendering to the analysis of the figure in relation to creative composition. (3W) Thorpe

105abc. Advanced Drawing and Composition. Special attention given to drawing in relation to creative composition. (3S) Thorpe

106. Perspective. The principles of cylindrical, parallel, and oblique perspective. For students of art and landscape architecture. (3S) Reynolds

7. Introductory Painting. Introducing basic approaches to painting which develop freedom of expression. Tempera and related media. Recommended prerequisite to all other painting courses. Larson, Thorpe

108abc. Creative Painting. Experiments in basic techniques of painting with approaches varying from designed realism to abstraction. Oil and related media. (3F, W) Groutage, Thorpe

109abc. Landscape Painting. Various approaches and techniques in painting—out-door sketching. Oil and related media. (3F, S) Larson

110abc. Figure Composition. Creative approaches to human and animal composition in painting. Oil and related media. (3F, W, S) Larson, Thorpe

111abc. Watercolor and Related Media. (3F, W.) Cornaby and Staff
112abc. Portrait Painting. The contemporary study of the functions and form problems of portrait painting in terms of the principles of value, plane, line, texture, color and design. Any media may be employed. (Prerequisite, Art 6) (3W)

113. Experimental Painting. Use of contemporary mediums, including plastic paint, vinylite, pyroxylin, etc. (3S)

INTERIOR DECORATION

40. Essentials in Interior Decoration. Study of historic styles and the analysis of art elements and principles of design applied to home planning and furnishing. (3F, W) Larson

140. Applied Interior Design. Practical application of art elements and principles of design to problems of home decoration and furnishing. (Prerequisite: Art 40) (3W, S) Larson

141abc. Advanced Problems in Interior Decoration. Experimental projects in home planning and furnishing. (Prerequisites: Art 40 and 140) (3S) Larson

SCULPTURE

160abc. Sculpture. Creative expression in a variety of plastic media. Emphasizes esthetic employment of form and the technique necessary to casting, built up plaster modeling, beating metals, stone cutting, and wood carving. (3S)

SPECIAL ART PROBLEMS

171abc, 271abc. Special Studio Courses. Individual work on specific problems as approved by instructor. Time and credit arranged. (F, W, S) Staff

272abc. Art Research, Seminar and Thesis Problems. Time and credit arranged. (F, W, S) Staff

The Division of Drama

Floyd T. Morgan, Associate Professor; W. Vosco Call, Claude Garren, Assistant Professors.

The undergraduate curriculum and theatre activities of the Drama division of the Department of Fine Arts are designed for students who desire to prepare themselves for teaching careers in Dramatic Art, for students who wish to specialize in Drama and for those who wish to prepare themselves for advanced study in Drama and Theatre.

Forty-five to fifty credit hours of work in Drama, Speech and dramatic literature are required for the teaching or non-teaching major in Drama. Required courses for these majors are Drama 30, 44, 50, 52, 130, 146 and 160, Speech 24, 125 and 181 and a minimum of 8 credits of dramatic literature. Recommended courses in dramatic literature are English 63, 163, 163, 169 and Drama 32 and 60. In addition to the above prescribed courses teaching majors should take one and non-teaching majors two of the following: Drama 150, 152, 154 or 156. Drama 194 and Speech 123 and 124 are recommended for the teaching major.

Special curricula may be arranged for students who wish to take a composite major combining courses in Drama with work in another department or division as Speech, English, Art, Music, Physical Education, etc. Sixty credit hours are required for the composite major. Ordinarily a composite major can be completed in four college years. Students who desire to complete a composite major in Drama and another division or department should work out their programs with advisers assigned to them by the heads of the departments concerned.
For the minor in Drama a minimum of eighteen credit hours are required including three hours in Drama 30. Other courses to meet the needs of the students are to be selected with the aid of an adviser.

An important activity of the Drama Division is the Utah State Theatre which produces several plays each year. Drama students participate in the various departments of a production—acting, directing, staging, lighting and managing.

Graduate Study

The Drama Division of the Department of Fine Arts offers advanced study and research leading to the Master of Science degree. In addition to the graduate courses offered in the Department of Fine Arts and in other departments the following upper division courses in Drama may be taken for graduate credit: Drama 130, 140, 146, 150, 160, 190, 192, 194.

Courses

30. Introduction to the Theatre. A course designed to acquaint the student with the theatre as a social institution. Readings and projects in the various aspects of the theatre. (F & S, 3) Morgan & Garren

32. Current and Recent Drama. Reading and discussion of recent and current plays, musical comedies and their productions. (W 2) Call

40. Theatre Workshop. Limited credit is given for participation in Utah State Theatre plays. Rehearsal and production staff work arranged. Consultant instructor for permission to register. (F, W & S 1 to 6) Staff

44. Fundamentals of Acting. Practice and theory of the basic principles and concepts of the art of acting. (F 3) Call

46. Intermediate Acting. A continuation of Drama 40 with emphasis on characterization and the development of the actor's physical, mental and emotional resources. (W 2) Call

50. Stagecraft. Technical organization and planning of the production, building, rigging and shifting of scenery and construction of properties. (F, W & S 2) Garren

52. Makeup. Practice and theory of straight and character make-up for the stage. One two hour laboratory period per week. Recommended for prospective directors of school, church and community theatrics. (F 1) Morgan

60. Drama Appreciation. Development of appreciation of drama and theatre through a better understanding of the contributions made to the production of a play by playwriting, acting, directing, designing and staging. Selected plays and materials on theatre and drama are studied. (W 3) Morgan

130. History of the Theatre. An historical survey of the theatre from ancient to modern times. (F 5) Call

140. Children's Theatre. Creative dramatics and the selection, preparation and presentation of children's plays. Recommended for prospective elementary school teachers. Consult instructor before registering. (S 3 or 5) Morgan

144. Advanced Acting. Emphasis on the creative approach to acting, analysis and creation of the role and on ensemble playing. (S 3) Call

146. Directing. Theory and practice of the principles of stage directing. Students select, cast, direct and present one act plays. (W 3) Morgan

148abc. Private Instructions. Individual tutoring to develop competence in acting, directing, scenic and costume design. Special fee. May be taken from one to three quarters. (F, W, S credit and time arranged.) Staff

150. Scene Design. Application of basic principles of design to the stage setting. Development of the scenic design through color sketches, plans, elevations and models. History of stage decoration and some painting techniques. (F 3) Morgan
152. Stage Costuming. Fundamentals of pattern drafting, construction of stage costumes and accessories, organization and care of costume wardrobes. (S 2) Garren

154. Stage Lighting. Study and application of the principles of stage lighting. Practice in planning the lighting and in mounting and operating lighting equipment. (W 2) Garren

156. Theatre Organization and Management. Study of the managerial aspects (organization, promotion, financing) of the education and community theatre. (W 2) Call

160. Dramatic Structure. Analysis of dramatic structure and technique as encountered in play directing, dramatic literature or in the writing of original plays. (W 3) Morgan

190. Problems in Drama. Selected research problems of merit and of mutual interest to students and instructors are investigated. Consult instructor for permission to register. (F, W & S) (Time and credit arranged) Staff

192. Projects in Theatre. Advanced work in acting, directing, scene design, costume design, costume construction, lighting, technical practice, make-up 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. By permission of instructors. (F, W & S) (Time and credit arranged) Staff

Graduate Courses

200. Seminar in Drama. Intensive study of special problems in the fields of drama and theatre. (F, W & S) (Time and credit arranged) Staff

202. Research Studies. Advanced research in drama and theatre. By permission of instructors. (F, W & S) (Time and credit arranged) Staff

204. Thesis. (F, W & S) (Time and credit arranged) Staff

292. Projects in Theatre. Advanced work at the graduate level in any of the branches of theatre art. By permission of instructors. (F, W & S) (Credit and time arranged) Staff

THE DIVISION OF MUSIC

Walter Welti, Professor; A. L. Dittmer, Irving Wasserman, Associate Professors; John Philip Dalby, Assistant Professor; George Partz, Instructor.

Courses Available to the General Student

The following are recommended. Others may be elected by qualified students.


General Requirements for all Majors in Music

*1, 2, 3, 4, 5, 6, Basic Theory; 107, Instrumentation and Arranging; 113, 114, History of Music.

Specific Requirements in the Various Areas of Specialization

Schedules 1 and 2 are designed to prepare teachers and supervisors for service in the public schools. Schedule 3 is pointed to the preparation of the private teacher, and provides the basis for graduate training in performance
and musical scholarship. Schedule 4 is designed for those who wish to broaden their knowledge and appreciation of music, but do not seek preparation for professional work in the field.

1. Composite: Instrumental Major, Vocal Minor

   The Major
   Major Instrument (Individual Instruction) 9 credits
   Minor Instrument (Individual Instruction) 4.5
   Group Instruction in Instruments 4
   Instrumental Conducting 3
   Instrumental Ensembles (Band, Orchestra, etc.) 18

   The Minor
   Group Instruction in Voice 3
   Group Instruction in Piano 3
   Choral Conducting 2
   Choral Ensembles (Chorus, Madrigals, etc.) 7
   Secondary School Choral Methods 3

2. Composite: Vocal Major, Instrumental Minor

   The Major
   Voice (Individual Instruction) 9
   Secondary Piano (Group and Individual Instruction) 6.5
   Choral Conducting 2
   Choral Ensembles (Chorus, Madrigals, etc.) 18
   Phonetics (Speech 7) 3

   The Minor
   Group Instruction in Instruments 9
   Instrumental Conducting 3
   Instrumental Ensembles (Band, Orchestra, etc.) 6

3. Composite: Performance Major, Minor in Theory and Literature or in Sacred Music

   The Major
   Piano (Individual Instruction) 22.5 credits
   or
   Voice or Other Instrument (Individual Instruction) 18
   and Secondary Piano (Individual Instruction) 4.5
   Ensemble in the Major Field 3
   Electives in Ensemble 3
   Literature of the Major Instrument or Voice 4
   Pedagogy of the Major Field 3
   Minor in Theory and Literature
   Upper Division Theory 9
   Literature 4
   Electives in Theory or Literature 6
   Minor in Sacred Music
   Secondary Instrument or Voice (Individual Instruction) 4.5
   Choral Conducting 2
   Sacred Music 3
   Choral Ensembles 6
   Counterpoint 3

4. General Major in Music

   Music 4, 5, 6, 107, 113, 114 (From “General Requirements for all Majors”) 18 credits
   Major Instrument or Voice (Individual Instruction) 9
   Ensemble 4.5
   Upper Division Theory or Literature 6
   Upper Division Electives in Applied Music, Theory, or Literature 6
Minor in Music
Music 1*, 2, and 15 credits in Music as approved by the Division, 8 of which must be Upper Division other than Ensemble.

Description of Courses

Theory

1, 2, 3. Basic Theory. Melodic structure and elementary two part work approached through aural, keyboard, and written routines. Prerequisite, Music 7 or its equivalent. (4F, W, S) Naylor

4, 5, 6. Basic Theory. Chorale-style harmony, instrumental texture, analysis of polyphonic and homophonic forms, considered aurally, at the keyboard and in written exercises. (3F, W, S) Naylor

7. Fundamentals of Music. The elements of time and pitch in music. Staff, clefs, note and rest values, musical terms, intervals, scales, modes, triads and inversions. A preparatory course for Basic Theory 1. (3F, S) Staff


102. Counterpoint. Study of the contrapuntal technic of the 16th Century. (3W) Dalby

103. Contemporary Idioms. A survey of typical devices employed in the music of today with emphasis on the logic of their derivation and development. (3S) Staff

104, 105. Conducting, Choral and Instrumental. Basic routines in dealing with vocal and instrumental ensembles; assigned projects in leading large ensembles, chorus, band, and orchestra. (2F, 3W) Staff

107. Instrumentation and Arranging. Study of each of the standard instruments in use today, their employment in small ensembles and large heterogenous groups. Scoring and arranging for band and orchestra. (3W) Dalby

108, 109. Projects in Composition and Scoring. Studies in composition for advanced students; writing in various forms, including some work for large groups. (3S) Dalby

History, Appreciation and Literature

13. Music Appreciation. A general survey of music in small and large forms presented through selected recordings, from folk, church, early and modern music literature, both vocal and instrumental. (3F, S) Welti

113, 114. History of Music. Music's place in history from antiquity to the present. Lives of eminent contributors to the development of music. (3F, S) Welti

116. Literature of the Piano. A consideration of selected masterworks for the piano and its precursors, from J. S. Bach and D. Scarlatti through the works of Beethoven. Offered in alternate years. (2F) Wasserman

117. Opera Literature. A study of opera as an art-form, with consideration of its evolution from the 17th century to the present. Offered in alternate years. (2W) Welti

118. Chamber Music. An analysis of the development of typical chamber music forms and styles including the sonata literature. Offered in alternate years. (2F) Dittmer

119. Symphonic Literature. The evolution of symphonic form; detailed analysis of typical examples from masters of the Classic, Romantic and Contemporary eras. Offered in alternate years. (2F) Dittmer

*See prerequisite to 1, Basic Theory in Description of Courses.
120. Art Song. Origin and evolution of the Art Song: early Italian songs, Lieder from Schubert to Strauss, modern French, English and American songs. Offered in alternate years. (2W) Welti

121. Sacred Music. Evolution of cantata and oratorio; service music with reference to liturgical settings; consideration of the modern anthem literature. Offered in alternate years. (3F) Dittmer

122. Literature of the Piano. A continuation of 116, featuring the works of early and late Romantic composers for the piano and a brief consideration of typical contemporary works. (2W) Wasserman

Ensemble

Ensemble may be repeated indefinitely under the same number.

123. Orchestra. Provides training and practical experience in a wide range of orchestral works including symphonies and the annual opera score. (Arr. F, W, S) Staff

126. String Orchestra. Drill in the routine of large ensemble playing. (1F, 1W, 1S) Pahtz

127. String Ensembles. Offers opportunities for capable string players and pianists to form trios, quartets, and other small units. (1F, 1W, 1S) Pahtz

128. Marching Band. Open to all students who play band instruments. Rehearsals and drills for presentation of shows for athletic events. Attendance at all public appearances of band required. (1 1/2F) Dalby

129. Military Band. Open to men students enrolled in ROTC Basic. Band drill and rehearsal. Fall quarter Military band combined with marching band meets daily. Winter and Spring quarters band meets twice weekly. All military band students excused from 1 hour military drill period each week. (1 1/2F, 1W, 1S) Dalby

130. Symphonic Band. Study and preparation of modern symphonic band literature; public performances and concerts; permission to register must be obtained from instructor. (1F, 1W, 1S) Dalby

131. Brass Ensemble. Brass quartets, sextets, and larger groups. Members are selected from applicants. (1F, 1W, 1S) Dalby

132. Woodwind Ensemble. A study of the literature for Woodwind Quintet and other small groups. (1F, 1W, 1S) Staff

133. Choir. Open to all students with normal singing voices; membership by audition; regular attendance is a condition of membership; public performances close each quarter's work. (1F, 1S) Welti

136. Opera Chorus. The chorus is trained to perform in the College Opera. Auditions are conducted intermittently to determine progress in memorization. (Arr. W) Welti

137. Madrigal Singers. Study and performance of madrigals and part songs; membership by audition. (1F, W, S) Dittmer

138. Meistersingers. A selected group of men singers. Admission by audition only. Auditions are conducted at first and second rehearsals. Limited registration. No credit for less than two consecutive quarters. (1F, W, S) Welti

139. Chansonettes. A selected group of women singers. Admission by audition only. Auditions are conducted at first and second rehearsals. Limited registration. No credit for less than two consecutive quarters. (1F, W, S) Welti

140, 141. Opera Staging and Production. For those who sing roles in the opera or work on the production staff; credit of 1 to 4 hours is arranged in accordance with the project undertaken. (W. 1 to 4) Welti

42, 142. Piano Ensemble. Practice in ensemble playing in groups adjusted to the advancement of the players. (1F, W, S) Wasserman

Music Education
150. Elementary School Music for the Classroom Teacher. Application of music to the elementary classroom. Problems, methods and materials in singing; rhythm, creative music, reading and appreciation. (3W, S) Dittmer

151, 152, 153. Secondary School Methods and Materials. Teaching and administration of various phases of the music program, choral, orchestral, and band. (3F, W, S) Staff

Applied Music

Individual instruction in Applied Music is credited as follows:

One lesson per week with required practice—1.5 credits.

Two lessons per week with required practice—3 credits.

A placement examination is required before initial registration for individual instruction in a major field of Applied Music. Each course of individual instruction continues through three quarters with credit of 1.5 or 3 each quarter, depending on the number of lessons per week. The completion of this sequence or its equivalent is required before registering for the next course. Credit is given separately for each quarter.

No more than three quarters of group instruction in one field may be credited on a degree.

60, 61, 160, 161. Major Piano; 92, 93. Secondary Piano; 80. Group Piano. Staff

62, 63, 162, 163. Major Organ. Clark

64, 65, 164, 165. Major Voice; 81, Group Voice. (1F, W, S) Dittmer, Welti and Staff

70, 71, 170, 171. Major Woodwind Instruments; 92, 93. Minor Woodwind Instruments; 82, Group Woodwinds. (1F, W, S) Staff

72, 73, 172, 173. Major Brass Instruments; 94, 95. Minor Brass Instruments; 83, Group Brass. (1F, W, S) Dalby

74, 75, 174, 175. Major String Instruments; 96, 97. Minor String Instruments; 84, Group Strings. (1F, W, S) Dittmer, Pahtz and Staff

85. Group Percussion. (1W) Staff

In addition to the staff members listed, private lessons in Applied Music are available under special arrangement with the following teachers:

Brass Instruments—Eldon Torbenson
Piano—Lucy L. Christiansen; S. E. Clark (and organ); Thelma Lundquist; Laverne Odd; Jeanne T. Welti.
Voice—Maxine Greenwood; Patience Thatcher.

For Special Fees for individual instruction in Applied Music see “Student Fees.”

Vocational Education

S. S. Richardson, Professor and Chairman; L. Mark Neuberger, Professor; Margaret B. Merkeley, Instructor.

Candidates for a teacher's certificate in any branch of Vocational Education must comply with Utah certification requirements. The following courses are suggested:

Agriculture Basic: Psychology 102; Education 112, 113, 114, 125, 126; Public Health 155; Elective, 3 credits.

Home Economics Basic: Psychology 102; Education 114, 120, 121, 122; Bacteriology 155; Public Health 155; Elective, 7 credits.

120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102. (3F or S) Staff

121. Problems in Teaching Home Economics. Recent investigations in Home Economics and their bearing upon Home Economics curricula and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) This course should be blocked with Education 122 and with one other 3-hour Education course so that concentrated work may be taken on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W, S) Staff

122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having co-operative arrangement with the College. Student teachers leave the campus the middle five or six weeks of Fall or Winter Quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122, preferably at the beginning of her junior year, to make arrangements for teaching at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8F, W, S) Staff

123. Student Teaching in Home Economics for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student dietitians, and patients. For other non-vocational homemaking education majors interested in securing practical teaching experience. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4S) Staff

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

125. Methods of Teaching Agriculture. Fundamental principles and practices of teaching agriculture, selection and organizing of subject matter, and supervision of agricultural activities on the farm. (5W or S) Richardson

126. Directed Teaching in Agriculture. Student observation and teaching in approved local vocational agricultural departments under supervision. Trainees leave the campus to train in selected Utah high schools for a full teaching program. (4-8W or S) Richardson

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

194. Principles and Objectives of Distributive Education. To acquire students with the general philosophy and purposes of vocational distributive education, and to enable them to understand and appreciate its place in the modern education program. Students compare the principles and objectives of distributive education with those of other educational programs. Arr. Staff

195. Part-time Distributive Education. The content, methods and devices to be used in part-time education program. Emphasis placed on problems of coordination, selection of students, arrangement of a class schedule, supervision on the job, and other phases of the co-operative part-time distributive education program in the high school. Requirements and standards of part-time vocational education will be treated. Arr. Staff

199. Special Problems in Home Economics Education. Developed around individual needs of students which are not otherwise provided for in curriculum. (1-2F W or S) Staff

210. Research for Master's Thesis. Credit arranged. Staff

225. Special Problems in Agricultural Education. A consideration of needs of individual students and special types of service. (1-2S) Richardson

226. Young Farmer and Adult Classes. Fundamental concepts in organization and instruction of young farmers and adults; principles and techniques of teaching classes. (3S) Richardson
Psychology and Guidance

Arden N. Frandsen, Professor and Head of Department; David R. Stone, Heber C. Sharp, Parley Newman, Associate Professors.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Courses in psychology contribute, therefore, to both professional training and personal development of students in nearly every department of the College.

A major or preferably a master's degree in psychology should prepare students professionally (1) for guidance and psychological counseling in high schools; (2) for teaching psychology: from habits, mental health, and personality development in high schools; (3) for diagnostic and remedial teaching and for dealing with personality and conduct problems of children in elementary schools and in child guidance clinics; (4) (with additional courses in Education) as a "special" teacher of exceptional children; (5) as clinical psychologists (with additional graduate training) in mental hygiene clinics and hospitals; (6) for personnel work (at the junior professional level) in industry, the U. S. Employment Offices, various Civil Service positions, and in the military services, and (7) for further graduate study in psychology, education, child development and social work. Psychology is also a suitable major for students planning to study medicine, nursing, law, and 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 industrial school, and a mental hospital in which graduate students and some seniors may have practical experience in the general field of clinical psychology. The experiences include educational and vocational counseling; diagnosis and guidance of gifted, subnormal, and delinquent children; diagnosis and treatment of conduct and personality problems; diagnosis and remedial instruction for achievement difficulties in school subjects; teaching psychology in high school or college; teaching exceptional children; and for various kinds of psychometric work.

Lower Division Preparation for Psychology. The best preparation for psychology is basic training in biological science, social science, literature, mathematics and physical science. In completing the group requirements, it is recommended that the following courses be included: Physiology 4; Sociology 70; English 40, 45, and other literature (novel and biography) courses; Mathematics 34, 35, and desirably additional mathematics courses for students with interest in the subject: Physics 7. 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, 80 and, if desired before attaining upper division status, 102, 105, and 112.

Requirements for a major in psychology include 40 credits of approved courses from the following basic: Psychology 53, 71, 102 or 105, 112, 127, 140 or 145, 161, 183, 281, 282; and elective: from Psychology 80, 102, 105, 108, 114, 115, 121, 123, 140, 145, 155, 175, 191; Sociology 170; Education 110; Speech 167, or 173. As upper division electives, Zoology 111; Physiology 121, 122, 123; the Education courses for teacher certification: Sociology 130, 153; S. W. 165, 270; an upper division courses in literature are also suggested.

A minor in psychology (which should include Psychology 53, 71, 102 or 105, 112, 127, 140 or 146, 161fi 181, and 183) is recommended for high school teachers who expect to participate in the school guidance program, social workers, students majoring in speech correction, students whose major is business administration, and students majoring in other social sciences.
Master of Science Degree in Psychology. Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program planned to meet the student's professional objectives may be arranged to include courses both from psychology and pertinent fields. In preparation for meeting the requirements for the Professional School Counselor's Certificate, for example, courses mainly from psychology and education would be chosen. Lists of the prescribed courses for this certificate and for other special professional objectives may be obtained from the Department Head. Besides the courses required for a specific professional objective, the Master of Science degree in psychology should include, as a graduate or undergraduate student, study in the following fields: (1) general and experimental, (2) systems and history, (3) learning, (4) child and adolescence (included in educational), (5) clinical psychology, (6) mental hygiene, abnormal psychology and physiological, (7) social psychology, (8) personality, (9) statistics, and (10) research thesis. Besides additional courses from those listed in each of the above 10 areas, courses planned especially for graduate students are: Psychology 115, 123, 175, 191, 202, 205, 208, 212, 213, 214, 216, 217, 260, 281, 282, 284, 285, 286, 287 or 288. For students who have not majored in psychology thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin graduate study in psychology.

Master of Science Degree in Guidance. Any able student who has a teaching certificate and a total of 30 credits in Education and, or in Psychology is eligible to begin study for this degree. Included in the courses required are: Education 110; Guidance 187, 213; and Psychology 123 or 140, 127, 183, 202 or 205, 281, 282, 285, 288; and a thesis in the field of guidance. These are also the courses required for a Professional Counselor's Certificate.

Personnel in Business and Industry: In cooperation with the Inter-Departmental Program in Human Relations, psychology students may earn a Master's degree in Personnel Psychology. This program would include the central courses outlined by the committee, and the following courses: Psy. 71, 80, 102 or 105, 112, 127, 140 or 145, 181, 183; Speech 9; Merchandising 63, 156; Sociology 130, 160, 161; and Social Work 165, 174.

Doctorate in Educational Psychology and Counseling. The Department of Psychology, in cooperation with the Department of Education has planned a program of advanced graduate study in counseling, school clinical psychology, and educational psychology that leads to the Ph.D. degree in Educational Psychology. The program requires two years of graduate study (partly supervised individual study) beyond the M.S. degree, plus a six months' internship in school, mental hygiene clinic, hospital, or social agency. Prospective candidates interested in learning more about this program should confer with Dean John C. Carlisle or Professor Arden Frandsen.

Courses

33. Mental Hygiene for College Students. Deals with the common personal and social problems of normal people, that is, problems which arise when people try to get along together. It is intended as a basis for improving self-understanding, personal and social effectiveness, happiness and emotional health. (3F) Sharp

51. Psychology for Nurses. ( ) Time arranged. Sharp

53. Elementary General Psychology. Principles of human behavior and experience including: nature of personality; factors of determining development; how we learn, observe, and think; motives of human conduct; dealing with people; maintenance of personal efficiency and mental health. For Lower Division students in all schools of the College. (6F, W. or S) Staff

71. Experimental Methods in Psychology. A study of the scientific methods and of specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: General Psychology. (3W) Sharp
80. **Reading and Study Habits.** A practical course, highly individualized, designed to aid students in improving the efficiency of their work and study habits. Individual appointments arranged for one-third of the time. (2F, W, or S) 
Stone

102. **Educational Psychology** for secondary teachers. A professional course for prospective high school teachers intended to increase understanding of adolescents and to develop insight into conditions for effective learning. Applications to development in adolescence of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects are emphasized. Prerequisite: General Psychology. (5F, W or S) 
Stone

105. **Child Psychology and Development.** The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional development in children from birth to adolescence. Generalizations with respect to dynamics of personality, individual differences, emotions, motivation, how children learn, observe, and think are applied to understanding and guiding children's behavior in home, school, and community. Opportunity for observation and applications of psychological methods of child study in the school is provided. Prerequisite: General Psychology. (3F, W, S) 
Frandsen

108. **Educational Psychology for Elementary School Teachers.** A study from the point of view of psychological theory and research, of the aims, selection and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. Prerequisite: General Psychology. (3F, W, S) 
Frandsen

112. **Application of Statistics to Education and Psychology.** Elementary study of statistical procedures used in handling test scores in schools and of the concepts needed to read current educational and psychological literature. May be taken by last quarter sophomores who have taken General Psychology. (3F or S) 
Frandsen

115. **Seminar. Readings and Discussions on 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. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2F, W or S) 
Staff

121. **Individual Differences.** The nature, extent, and causes of human differences and of the implications and applications of a recognition of these differences in several major life activities. The concepts of human differences have useful applications in the work of the students majoring in the other social and biological sciences. (3S) 
Sharp

123. **Psychology of Exceptional Children.** The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment, suited to their needs. The groups included are the mentally deficient, physically handicapped, the gifted, and children having serious personality and conduct problems. (3W or Su.) 
Sharp

124. **Curriculum and Teaching Methods for Mentally Retarded Children.** A study of curricula and adaptations in methods of teaching especially suited to the needs and patterns of abilities of mentally retarded children. The course should provide helpful guidance both for teachers of special classes for these children and for teachers who provide for them in "regular" school classes. Prerequisite: Psychology of Exceptional Children. (3S) 
Staff

127. **Psychology of Learning.** A comprehensive study of descriptions of learning, factors related to efficiency, explanatory theories of learning, and of applications of the facts and explanatory principles to guiding learning in school and out-of-school situations. Prerequisite: General Psych. (3S) 
Frandsen

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: General Psych. (3S) 
Sharp
145. Mental Hygiene. Designed for teachers and other workers in social occupations. Based on the philosophy that a knowledge of the factors which influence mental health should be in the possession of all who work with people. Intended to promote understanding of emotional and social adjustment and as a basis for guiding children, adolescents and adults toward improved mental health. Prerequisite: General Psych. (3W)

155. Psychology of Business and Industry. Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice; selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work, and psychological aspects of training for work in business and industry. (See also Business Administration 155) Prerequisite: General Psychology or instructor's approval. (3F)

161. Social Psychology. A study of the acquisition of personality or "self." The effect of society on the individual, and the individual's reciprocal effect on society are considered in terms of such topics as propaganda, institutional behavior, "social" neuroses, morale, leadership, and membership. Prerequisite: General Psych. (3W)

162. Social Psychology of Teaching. An application of the concepts of "self" and of "group dynamics" to teaching, and to leadership and participation in other social situations. (3W)

165. Psychology of Military Leadership. (3S)

175. Physiological Psychology. Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances Prerequisite: General Psych. (3S)

183. Theory and Techniques of Counseling. Principles and techniques of counseling students on problems of curriculum planning and vocational choice, on problems of improving methods of study, and on problems of emotional and social adjustment will be studied. Applications will be made also to administrative, supervisory teaching, and other inter-personal relations situations. (3S)

191. History and Systems of Psychology. History of psychology and a critical comparison of the several systematic points of view on major problems in psychology. (3S)

202. Psychology of Adolescence. Growth, psychological and social characteristics and development, educational and guidance needs, and adjustment problems of adolescents as met in schools, homes, and communities. Prerequisite: Educational Psych. (This course and the Psychology of Learning provide training in advanced educational psychology for graduate students in secondary education and in psychology.) (3Su.)

205. Problems in Child Psychology and Guidance. Elementary school child guidance problems—study of the roles of teachers and child guidance specialists in promoting mental health and in diagnosing and treating problems of achievement, social adjustment, and emotional maladjustment. The course may be considered as an advanced course either in child psychology or in elementary school guidance. Alternates with Psychology 280. (3F)

208. Advanced Educational Psychology of the Elementary School. Advanced study, from the points of view of learning theory and experiments in elementary education and child psychology, of the aims, curriculum, methods of teaching, provisions for individual differences, and evaluation of outcomes in the elementary school. Intended especially for supervisors, principals, and teachers of the elementary school interested in graduate study. Thesis topics are suggested. Provision is also made for undergraduate students who need the course Psych. 108 for certification. (3Su.)

212. Treatment of Psychometric Results. Statistical methods of representation, and analysis of interrelationships of psychological test scores. (2W)
214. Independent Readings in Psychology. For students who cannot participate in the discussions in Psychology 115, this course provides opportunity for independent readings and conferences on topics selected by the student. (2F, W or S) Staff

216. Research on Special Problems in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) Staff

217. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) Frandsen, Stone, Sharp, Newman

280. Personality. An advanced study of the organization, development, dynamics, and appraisal of personality. Theories and empirical investigations of personality will be studied as a basis for arriving at integrated concepts of the nature and development of personality. Both the biological and cultural determinants of personality will be considered. Alternates with Psych. 205. (3F)

281. Psychometrics Applied to Guidance. For school counselors, personnel workers, social workers, and clinical psychologists. Consideration is given selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisites: General Psychology and Elementary Statistics. For seniors or graduate students. (5F) Sharp

282. Individual Diagnostic Intelligence Testing. Theory and techniques of testing, including practice in the administration of (a) the Stanford-Binet and other individual tests especially suited to psychological examination of children, and (b) the Weschler-Bellevue and related tests for use with adolescents and adults. Interpretation of test data. (5W) Frandsen

284. Hospital Treatment of Mental Patients. Seminar and staff conferences on personality appraisals, diagnoses, and treatment of mental hospital patients. Students observe and participate in treatment to the extent they are qualified in all of the hospital routines and “treatment” activities in which patients participate. (4F, W or S) Staff


286. Problems in Counseling and Clinical Psychology. Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy are studied. (2F) Frandsen

288. Practicum in Clinical Psychology. Arrangements are made for obtaining experience under staff supervision in vocational guidance; diagnostic testing and writing of interpretative reports; counseling; psychotherapy; diagnostic and remedial teaching. Subjects include children, adolescents, and adults in schools, institutions for the mentally retarded and for delinquents, and patients in mental hospitals. Psychological procedures and institutions are selected according to qualifications and interests of each student. Time and credit arranged. (F, W or S) Staff

314. Adv. Independent Study in Psychology. Staff

Guidance


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

297. Workshop in Guidance. A faculty or part of a faculty in a school or school district studies, evaluates, and attempts to improve the use of the school's resources for more effective guidance in its several phases. (3) Staff
Library Science may be used as a teaching minor in connection with a major in Education. This course prepares the student for a library certificate as issued by Utah State Board of Education and for a position as school librarian on the elementary or secondary level. A teaching minor of not fewer than 18 credits must be selected from Library Science courses.

The courses required for an Elementary library certificate are English 24, L.S. 120, and L.S. 150; for a high school library certificate: L.S. 120, L.S. 150, and L.S. 155.

The following elective courses may be used to satisfy the requirement of the Northwest Association of High and Secondary School Standards of 30 hours for a library position in High Schools of more than 300 students. Education 161, 107; English 122; Speech 118.

1. Introduction to Librarianship. A preview of the library profession, its philosophy and requirements. (2, F, W) Davis, Smith

50. Reference Materials. Basic reference tools and an introduction to the library. (3F) Davis

100. Advanced Reference and Bibliography. Principal reference materials in the major subject fields. Methods of bibliography. Prerequisite Library Science 50 (3S) Tolman

113. Book Repair and Binding. Limited to Library Science minors. (S2) Staff

120. Cataloging and Classification. Dewey decimal system of arranging books in an orderly fashion and the methods of preparing a library card catalog. (4W) Davis

150. Library Administration. Procedures and techniques of library oper- (3S) Davis

155. Book Selection. The materials used and records required in ordering books. (3W) Davis, Smith

160. Art of the Book. The history of bookmaking, printing, and libraries. (3F) Tolman

170. Readings and Conference. Time and credit arranged. Any quarter. Limited to Library Science minors. Instructors approval required. Staff
SCHOOL OF ENGINEERING AND TECHNOLOGY

J. E. CHRISTIANSEN, Dean

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<td>Welding</td>
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General Information

The School of Engineering and Technology consists of the Division of Engineering and the Division of Technology. The Division of Engineering offers both undergraduate and graduate curricula in professional engineering. The Division of Technology offers both two-year and four-year curricula in several specialized fields of Industrial Technology. It also offers undergraduate and graduate courses in Industrial Education.

Scholarship. All students must maintain an average grade of C or higher to remain in College and be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade C or higher. In the Division of Engineering, it is important that students make a grade of C or higher in all mathematics taken during the freshman and sophomore years. Students who fail to do this usually have difficulty in upper division engineering courses.

Graduation. Candidates for graduation must satisfy the general college requirements listed in "Academic Regulations," except those pertaining to group requirements. They must, in addition, satisfy the requirements of the prescribed curriculum of their elected major.

Opportunity for Graduates. The tremendous development in modern industry, the necessity for control and development of natural resources, the rapid advance of transportation and communication, and the development of structures to meet the needs of society, give assurance that graduates of the School of Engineering and Technology will have ample opportunity for remunerative professional employment.

Faculty Advisers. Personal contact with the student is provided through a system of advisers who assist the student when registering, and who are available for consultation at all times.

Personnel Service. The School of Engineering and Technology, through its faculty, establishes definite contacts with those industries, corporations, municipal, state and federal agencies that employ technically trained men. Employment assistance is given to members of each graduating class, to alumni who desire to change positions, and to undergraduates who wish summer employment.

DIVISION OF ENGINEERING

The Division of Engineering offers undergraduate curricula in Civil Engineering, Electrical Engineering (Electronics and Communications Option) and Tool Engineering. Graduate study for the Master of Science degree is offered in Civil Engineering, Electrical Engineering and Irrigation and Drainage Engineering. The Civil and Irrigation Engineering Department provides a two-year graduate program for the professional degree of Civil Engineer and Irrigation Engineer and collaborates with other departments in offering the Doctor of Philosophy degree in Irrigation Science.

A department of Engineering Drawing provides service courses in drafting for all departments of the College.

Objectives. The objectives of the four-year curricula in engineering are to provide the student with an opportunity to obtain the thorough, fundamental, and technical education necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities that are essential to high professional attainment. The curricula are carefully planned to meet the recommendations of the Engineers Council for Professional Development.

Admission. For general requirements, see "Academic Regulations," in the Introduction, page 44. For admission to the professional engineering curricula, students should have taken in high school, in addition to general entrance requirements, Algebra A and B and Plane and Solid Geometry. Students with deficiencies in high school mathematics are strongly urged to spend a Summer Session in college preparatory work at the college prior to registration for the Fall Quarter. Students who enter the Fall Quarter with
deficiencies, and those who are unable to carry successfully the mathematics courses listed for the Freshman year, will have an opportunity to make up this deficiency during the Summer Session, between the Freshman and Sophomore years. All students will be expected to be registered for Math. 98, Differential Calculus, concurrently with Physics 20, Fall Quarter of the Sophomore year. Students planning to take Advanced Air Science or Military Science, should arrange a five year program of study.

**Upper Division Standing.** A student must have completed 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22 and Mathematics 99 or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

**Engineering Societies.** General professional association and advancement are promoted by activities of student branches of national engineering societies. The following are represented, either by institutional membership, faculty membership, or student chapter: American Concrete Institute, American Geophysical Union, American Road Builders Association, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society for Engineering Education, American Society of Tool Engineers, the Institute of Radio Engineers, and others.

**Honor Societies and Scholarships.** The Alpha Delta Chapter of Sigma Tau was installed at Utah State Agricultural College in February, 1951. Membership is elected from junior and senior engineering students whose scholarship is in the upper third of their class.

Graduating Seniors in the upper ten percent of the class are eligible for membership in Phi Kappa Phi. Graduate students may be elected to Associate Membership in Sigma Xi, honorary scientific society.

Several scholarships are available to engineering students. (See "Scholarships, Fellowships, Awards" in Introduction to catalog.)

**Engineering Seminars.** Engineering seminars are a feature of the advanced engineering work. Course C. E. 198 is required of all Civil Engineering students in their senior year. E.E. 175 and T.E. 184 are required of Electrical and Tool Engineering seniors respectively.

**Field Trips.** Field trips to local construction projects, engineering works, and industries are arranged for engineering students. Seniors in engineering usually take a supervised field trip covering the major engineering works in the Western United States. This trip is usually scheduled in the Spring Quarter.

**COMMON FRESHMAN CURRICULUM IN ENGINEERING**

<table>
<thead>
<tr>
<th>Dept. No.</th>
<th>Course Title</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.E. 1, 2, Electives</td>
<td>Engineering Orientation</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>E.D. 61, 62</td>
<td>Engineering Drawing</td>
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<td>3</td>
<td>3</td>
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<td>E.D. 63</td>
<td>Descriptive Geometry</td>
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<tr>
<td>Math. 35</td>
<td>College Algebra</td>
<td>5</td>
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<tr>
<td>Math. 46</td>
<td>Plane and Spherical Trigonometry</td>
<td>5</td>
<td></td>
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<tr>
<td>Math. 97</td>
<td>Analytical Geometry</td>
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<tr>
<td>Chem. 10, 11</td>
<td>General Chemistry</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<tr>
<td>Dept. Requirement</td>
<td>Approved Elective</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>English 1, 2, 3</td>
<td>Basic Communications</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>M.S. or A.S.</td>
<td>Basic Military or Air Science</td>
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</tbody>
</table>

1Orientation taken in Spring Quarter is under direction of the major departments.

2Students deficient in High School mathematics, Algebra B, will register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years.

3Department requirement indicated in Freshman year under the respective curricula. If indicated as elective, must be approved by Department Head.
Engineering Drawing

Austin G. Loveless, Associate Professor and Head of Department; B. O. Willhite, Willis A. Tingey, Assistant Professors; Ross A. Nyman, Instructor.

Note: Students taking any of the courses in engineering drawing are advised not to purchase their instruments or supplies for these courses until after they have attended the first scheduled exercise and received instructions concerning materials.

The Engineering Drawing department offers service courses in drafting and blueprint reading to all departments of the College.

The Department's four drafting laboratories have a total floor space of 5400 square feet and are equipped with 120 individual drafting tables. Modern instructional equipment such as drafting machines, reproduction facilities, moving pictures, slides, and other teaching devices are available to students. Since this is primarily a service department, basic courses are designed to meet needs of many departments.

Students may qualify for a minor in Engineering or Mechanical Drawing on completion of 18 credits, including Descriptive Geometry.

Courses

59. Blueprint Reading and Industrial Drawing. Broad coverage for those desiring only one quarter's work in drafting. Reading and interpretation of blueprints, lettering, use of instruments, and basic drafting practices. Two lectures, two labs. (3S) Nyman

60. Elementary Drafting. For Forestry students. Use of instruments, simple lettering, and drafting fundamentals. One lab. (1W) Tingey

61, 62. Engineering Drawing. The use of drafting instruments, graphic solutions, applied geometry, lettering, principles of shape and size description, sectioning, and standard elements and symbols. Problems are included in sketching; pictorial illustrations are made from orthographic views. (3F, W, S) Staff

63. Descriptive Geometry. Principal and auxiliary views, points, lines, and planes, developments, intersections and warped surfaces. Engineering problems relating to cut and fill, mining, geology, and industrial design are selected. Prerequisites: E.D. 61 or L.A. 20. One lect., two labs. (3F or S) Staff

93. Mechanical Drawing. Advanced work for those interested in a drafting minor. Includes basic work in industrial drawing, including machine fasteners, developments for patterns, and fundamentals of architectural, structural, welding, piping, and electrical drawings. Prerequisite: E.D. 62. (3F, S) Willhite

94. Working Drawings and Specifications. An introduction to architectural drawing and specifications applied to building and construction problems. Scale drawings including plans, elevations, sections and construction details are completed with tracings and prints. Prerequisites: E.D. 62 (3W) Willhite


120. Mechanical Drawing for Industrial Arts Teachers. Emphasis is given to the preparation of course work and the training of teachers to teach architectural, sheetmetal, machine, and electrical drawing, as applied to the junior and senior high school industrial arts program. Prerequisite: E. D. 62 or equivalent. (3F) Loveless

194. Mechanical Perspective. Practical problems in angular, parallel, and oblique perspective. Techniques in rendering finished drawings. Prerequisites: E.D. 94 or 95. (3S) Loveless

195. Industrial Production Illustration. Translation of working drawings into dimetric and trimetric projections, exploded views, and assemblies as a means of rendering industrial illustrations. Prerequisite: E.D. 94 or 95. (3W) (Taught alternate years with E.D. 194) Loveless
196. Aircraft Drawing. Aircraft techniques, numbering systems, change methods, and technical specifications are stressed. Prerequisite: E.D. 95. (3S) Willhite

197. Drafting Room Practice. Personnel and organization of drafting room and its position in industry. Preparation, reproduction and care of drawings and prints. Prerequisite: E.D. 95. (5S) Willhite

Agricultural Engineering

Spencer H. Daines, Associate Professor and Head of Department; J. Donald Wadsworth, Extension Agricultural Engineer; Von H. Jarrett, Instructor; Albert B. Smith, Instructor and Project Engineer for College—Industry Farm Electrification Committee.

The Department of Agricultural Engineering offers service courses involving application of engineering knowledge to solution of farm problems. The most important of these problems are related to farm machinery, farm power, farm structures, drainage, irrigation, soil erosion control, and modern farm and home equipment.

The Department offers service courses in farm mechanics designed to give students practical training in use of hand and power tools and other mechanical skills related to farming and industry. Classes are open to all college students.

Typical Program of Study For Two-Year Certificate of Completion In Agricultural Mechanics

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<td>English 1, 2, 3</td>
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<td>E.D. 61, 62, 63</td>
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<td>Welding 61, 94</td>
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<td>M.S. or A.S.</td>
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<tr>
<td>Approved Electives</td>
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</table>

This program is suggestive only. Variations are permitted according to a student's objectives so long as he has the approval of his advisor and department head.

Courses

1. Farm Mechanics. A basic course in the 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. 3 lectures, 2 labs. (5F, W) Jarrett

4. Dairy Mechanics. Basic equipment found in modern dairy plants; its accessories and upkeep. Three lectures, one lab. (4F) Daines

10. Irrigation Practice. Primarily for agricultural students. Principles and practices underlying efficient and economic use of water in irrigation. Water measurement, farm leveling. Prerequisite: Math. 34. Three lectures, one lab. (4F or S) Bagley

14. Farm Power for Agricultural Students. Principles, operation, care and maintenance of internal combustion engines and electric motors. Two lectures, one lab. (3F or S) Daines

15. Farm Machinery for Agricultural Students. Principles of mechanics and materials applied to farm machinery. Operation, adjustment, and care of agricultural machines. Two lectures, one lab. (3W or S) Daines
101. Farm Buildings. Especially for Agricultural students. Planning, estimating, layout, construction materials, painting, remodeling, wiring, plumbing, fencing, concrete and masonry as related to farm structures. Three lectures, two labs. (6S)

Jarrett

102. Farm Power. Operation, care and maintenance of tractors and farm engines such as found on the average farm. Diesel, L.P.G., 4-cycle and 2-cycle engines and electric motors. Three lectures, two labs. (5W or S)

Jarrett

103. Farm Machinery. Selection, operation maintenance, and repair of farm machinery including materials of construction, mechanics, transmission of power, adjustment of tillage, planting, spraying, dusting, forage and harvesting equipment, brazing cast iron, welding, hardfacing and use of the carbon arc torch. Three lectures, two labs. (5F)

Jarrett


Daines

109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply and farm sanitation, farm electrical systems and appliances. Three lectures, one lab. (4W)

Daines

110. Irrigation Principles. Primarily for upper division students in agriculture and other schools. Water measurement, conveyance, and application, consumptive use of water and water requirements, pumping drainage, and soil-water relationships. Prerequisite: Math. 34 and upper division standing. Two lectures, one lab. (3S)

Hansen

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering. The student is expected to develop his own initiative in pursuing these problems. Standard formal type-written reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged.

Staff

298. Thesis. Time and Credit arranged. (F, W or S)

Staff

CHEMICAL ENGINEERING CURRICULUM

The following is a suggested outline of courses for Freshmen and Sophomores desiring to major in Chemical Engineering. Students would transfer to the University of Utah, or other colleges or universities granting degrees in Chemical Engineering, at the end of the Sophomore year.

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<td>Chemistry 3, 4, 5</td>
<td>5 5 5</td>
<td>Economics 51</td>
</tr>
<tr>
<td>M. S. or A. S.</td>
<td>1 1 1</td>
<td>M. S. or A. S.</td>
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<td><strong>18</strong></td>
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</table>

*Students deficient in High School mathematics, Algebra B, will register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have an opportunity to make up mathematic deficiency during the Summer Session between Freshman and Sophomore years.
Civil and Irrigation Engineering


This department offers a Bachelor of Science Degree in Civil Engineering, Master's Degrees in Civil or Irrigation and Drainage Engineering. A professional engineering degree is offered in Civil or Irrigation and Drainage Engineering. This department collaborates with other departments in offering the Doctor of Philosophy Degree in Irrigation Science.

Civil Engineering consists of the economic application of the laws, forces and materials of nature to the design and construction of engineering structures, including irrigation and drainage systems, highways, railways, bridges, buildings, dams, water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

The carefully planned curriculum in Civil Engineering is accredited by the Engineers Council for Professional Development. It is based upon a thorough training in English, Mathematics, Physics, and Chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to many phases of Civil Engineering.

A Summer Surveying Camp is offered, academic work is supplemented by local field trips during the junior year, and a major field trip of approximately one week duration, in the senior year. These field trips provide opportunity for first-hand study of projects under investigation, construction, and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

The Civil and Irrigation Engineering department is housed mainly in the Engineering Building, where well-equipped laboratories and classrooms provide ample facilities for experimental work. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. A model hydraulic laboratory demonstration unit is available for instruction and laboratory use. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the engineering properties of soil. The materials testing laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscope.

A program of research is conducted in collaboration with Agricultural Research Service, of the U.S. Department of Agriculture under the direction of the Agricultural Experiment Station. This, together with activities of the Engineering Experiment Station, provides opportunities for qualified students to act as part-time research assistants and thereby obtain experience and compensation for their services.

*On leave 1956-57.
Utah State Agricultural College is located in the heart of the Irrigation regions of the West. Emphasis is placed upon basic principles of engineering applicable to the design, construction, operation and maintenance of irrigation systems, and upon the solution of problems related to irrigation agriculture.

Civil Engineering Curriculum

Degree: Bachelor of Science in Civil Engineering

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Courses

1. Engineering Orientation. A preview of engineering; what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. (1F, 1W) Christiansen

2. Slide Rule Instruction. Practice in the use of the Log-Log slide rule. (1F, 1W, 1S) Christiansen

3. Civil Engineering Orientation. Lectures covering the various sub-divisions of Civil Engineering. (1S) Christiansen

65. Engineering Problems. Methods of computations include the use of logarithms, slide-rule, and calculating machines. Emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 35 and C.E. 2. One lab. (1F or 1S) Tingey

¹May be selected from one of the following: history, economics, government, literature, sociology, philosophy, psychology, or fine arts.

²Students deficient in High School mathematics, Algebra B, will register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years.

³Technical Electives may be selected from the following: C. E. 120, 124, 125, 127, 130, 131, 132, 147, 148, 149, 160, 181, 182. (Courses will be taught only for classes of eleven or more students.)
80. Office practice: For Foresters. Practice in preparing office plans from surveys that are encountered by the forester in working up field notes. Prerequisite: C.E. 81 or equivalent. Two labs, one lecture. (3W) Tingey

81. Plane Surveying. Primarily for Forestry students. Use of tape, hand level, level transit, compass and plane table. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisite: Math. 35 and 46. One lecture, two labs. (3F or 3S) Tingey

82. Mapping and Office Practice. Practice in mapping various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. Two lectures, two labs. (4W) Stock

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

85. Advanced Surveying. Problems in chaining, leveling, curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Two lectures, two labs. (4S) Stock

101, 102, 103. Engineering Mechanics. Includes statics, dynamics, and strength of materials. Fall Quarter and part of the Winter Quarter are devoted to study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and the kinematics and kinetics of bodies in translation, rotation and plane motion. The remainder of the year is devoted to study of properties of engineering materials, stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads and special topics. Prerequisite: Math 90. Three lectures, one lab. (4F, 4W, 4S) Greaves or Kiefer

105, 106, 107. Structural Theory and Design. This sequence introduces the analysis and design of structures and their elements. C.E. 105 and 106 cover stress analysis and design in steel, timber, and reinforced concrete. In C.E. 107, students are given more comprehensive problems in the design of buildings and bridges. Prerequisites: Engineering Mechanics; C.E. 101, 102, 103. Fall and Winter Quarters, recitation daily, one lab. Spring Quarter, five recitations. (6F, 6W, 6S) Kepner

111. Advanced Dynamics and Kinematics. Kinematics of linkages, belts, gears and cams. Design of machine elements subject to dynamic loadings. Two lectures, one lab. Prerequisite: C.E. 103. (3F) Kepner or Greaves

112. Stresses in Machine Elements. A study of stresses in machine parts; theories of failure; statically indeterminate stresses and deflections; thermal stresses; stress concentration. Prerequisite: C.E. 103. Three lectures, one lab. (4W) Kepner or Greaves


124. Introduction to Traffic Engineering. A study of the basic traffic problems; the route problems of transportation, indices of transportation inefficiencies, procedures of collecting and analyzing transportation survey data, and the resulting remedial actions for the solution to the problems. Prerequisite: C.E. 120. Two lectures, one lab. (3S) Stock

125. Highway Design. Theory and practice in design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisites: C.E. 120. Two lectures, one lab. (3W) Stock

127. City Planning. Master plans, civic units, parks and playgrounds, utilities, housing, sub-divisions, zoning, civic centers and airports. Three lectures. Prerequisites: C.E. 120. Two lectures, one lab. (3F) Stock

128. Non Metallic Materials. The nature and properties of non metallic engineering materials. Includes testing materials in accordance with ASTM standards. Three lectures, one lab. (4W) Staff

130. Building Construction and Cost Estimating. Construction methods used in fabrication and creation of buildings and practice in estimating costs. 2 lectures, one lab. (3F) Greaves or Kiefer
131, 132. Structural Design Problems. Problems in deflection of beams and trusses, analysis and design of statically indeterminate trusses and rigid frames. Open to seniors and to graduate students in Civil Engineering. C.E. 103 is prerequisite for C.E. 131 and C.E. 105 and 106 are prerequisites for C.E. 132. (3W, 3S) Kepner

141, 142. Fluid Mechanics and Hydraulics. Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, flow of fluids in pipes and open channels, measurement of fluid flow and hydraulic principles underlying the design and selection of tangential and reaction turbines and pumps. Prerequisites: C.E. 196. Three lectures, one lab. (4W, 4S) Hansen

143. Irrigation Principles. For advanced engineering students. Soil, water, plant relations; water requirements, efficiency of water use; flow of water in soil. Prerequisites: C.E. 142. Three lectures, one lab. (4F, or 4S) Hansen

144. Applied Hydraulics and Pneumatics. Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite. C.E. 141. Two lectures, one lab. (3S) Greaves

146. Design of Water Conveyance Irrigation Structures. Application of principles of solid, fluid, and soil mechanics to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 106, 142, and 150. Three lectures. (3S) Bishop

147. Design of Water Control Structures. Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: CE 146. Three lectures. (3S) Bishop

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 both surface and sprinkling methods. Prerequisite CE 146, 143. (3S) Bishop

149. Irrigation Institutions. Laws governing acquisition, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; federal legislation affecting water. Three lectures. (3F) Milligan

150. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and seepage, shear, stress, distribution, consolidation and stability as factors in the design of earth structures and foundations. Prerequisites: C.E. 103, 142. Three lectures, one lab. (4F) Greaves or Milligan


171. Hydrology. (Primarily for Forestry Students.) Weather elements, factors influencing run-off, and influence of range and land-management practice on run-off and erosion. Three lectures. (3F) Bagley

173. Hydrology and Meteorology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, ground water, and runoff methods of collection of hydrologic data and their use in water supply and flood control studies. Prerequisite: C.E. 141, or by special arrangement. Three lectures, one lab. (4W, 4S) Bagley

176. Application of Thermodynamics. For Aeronautics, and Automotive majors. Applications of laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigeration are studied. Prerequisites: Math. 35, 44; Physics 19. Three lectures, one lab. (4W) Koerner

181. Photogrammetry. The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: E.D. 63, C.E. 81 or 85, or Senior standing in Forestry, Range or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3S) Tingey
182. Route Surveying. Theory and practice in highway curves and earth work, including methods used in highway, street, canal, pipe line and general project surveys. One lecture, one lab. (2S) Stock

191. Senior Project. Research or testing project in some phase of engineering. Student conducts minor research project under direction of faculty. Conducted cooperatively with C.E. 198 and English 111. (1W, 1S) Staff


194. Sewerage. Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical and biological action and methods of final disposal. Prerequisite: C.E. 142. Three lectures, one lab. (4S) Kepner or Stock


196. Elementary Engineering Thermodynamics. The general energy equations, principles of the thermodynamic cycles for internal combustion engines, processes of vapors, air compression, refrigeration, and flow of fluids. Prerequisites: Physics 22 and Math. 99. Three lectures, one lab. (4F or S) Kepner

198. Senior Seminar. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Civil Engineering Seniors. One lecture. (1F, W, S) Christiansen

201, 202. Advanced Structural Theory. Review of elementary strength of materials, advanced topics in stress analysis involving central, torsional, and flexural loads. Open to graduate students in Civil and Irrigation Engineering and to qualify Senior students, with the approval of the instructor. (3F, 3W) Kepner

203. Advanced Structural Design. Individual problems in the design of modern structures. Checking of designs by model analysis may be selected. Prerequisite: C.E. 132 (3F, W, or S) Kepner

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. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. Prerequisite: C.E. 150 (3W) Greaves or Milligan

211. Masonry Dams. Design of rigid type dams. Stress, analysis and design of gravity, gravity-arch, multiple arch, and deck types of masonry dams. Timber, steel, and miscellaneous types are also considered. For graduate students and specially prepared seniors. Prerequisite: C.E. 103. (3F) Greaves or Milligan

212. Appurtenances to Dams and Operation of Reservoirs. Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. For graduate students and specially prepared seniors. Prerequisite: C.E. 142. (3S) Greaves or Milligan


220, 221, 222. Advanced Highway Engineering. Economics of location and design, selection, improvement and maintenance, traffic control, administration and finance, and jurisdiction as applied to highways. Prerequisite: C.E. 125. (3F, W, S) Stock
230. Special Problems in Civil, Irrigation or Drainage Engineering. Independent study of a chosen problem under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged.

231, 232. Irrigation Science. Advanced study in irrigation including such topics as consumptive use of water, soil moisture, irrigation, erosion, and land management, infiltration, permeability, and other irrigation engineering principles and practices. (3W, 3S) Staff


243. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisite: C.E. 142 and 147. (3S) Hansen

245. Advanced Design of Drainage Systems. Measurements of field permeability, hydraulics of wells, pumping for drainage, leaching and reclamation of saline soils, etc. (3W) Staff

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. For graduate students and specially prepared seniors. Prerequisite: C.E. 150 or its equivalent. (3S) Bishop

251. Advanced Soil Mechanics Laboratory. Advanced laboratory work in soil mechanics. (1S) Staff

273. Advanced Hydrology. Application of basic hydrologic principles to engineering investigations. Application of the unit hydrograph, infiltration analysis, hydrograph analysis, streamflow routing for reservoir operation and control, use and storage of groundwater. For graduates and specially prepared seniors. Prerequisite: C.E. 173. Three lectures. Credit arranged. Staff

295. Sanitary Design. Principles of design, construction and operation of water purification and sewage treatment plants. Prerequisite: C.E. 193, 194. (3W or S) Kepner

298. Graduate Thesis. Time and credit arranged. Each quarter. Staff

299. Graduate Seminar. Time arranged. (1S) Staff

ADVANCED DEGREES IN IRRIGATION AND DRAINAGE

The program of study for either the degree of Master of Science in Irrigation and Drainage Engineering, or for the professional degree of Irrigation Engineer depends upon the student's previous training and experience. It should contain basic sequence courses to strengthen the undergraduate program and to provide adequate training in irrigation and drainage. Since students come to this institution, with different objectives, no rigid curricula can be suggested for advanced degrees. Typical programs of study for students having the Bachelor of Science degree in either Agricultural Engineering or Civil Engineering for the Master of Science degree in Irrigation and Drainage Engineering or the degree of Irrigation Engineer are as follows:
TYPICAL PROGRAMS OF STUDY FOR THE M. S. DEGREE IN IRRIGATION AND DRAINAGE ENGINEERING

Those with B.S. Degree in Ag. E. Those with B.S. Degree in C. E.
Course F W S Course F W S
C. E. 105, 106 6 6 C. E. 210, 273 3 3
C. E. 148, 231, 232 3 3 3 C. E. 241, 242, 245 3 3 3
C. E. 146, 148 3 3 C. E. 141, 146, 147 3 3 3
C. E. 145 4 C. E. 149, 231, 232 3 3 3
Agron. 107 5 Agron. 107 5
C. E. 298 2 4 5 C. E. 298 2 4 3
C. E. 299 1 C. E. 299 1

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TYPICAL PROGRAMS OF STUDY FOR THE DEGREE OF IRRIGATION ENGINEER

FIRST YEAR

Those with B.S. Degree in Ag. E. Those with B.S. Degree in C. E.
Course F W S Course F W S
Math. 130, 131, 132 3 3 3 Math. 130, 131, 132 3 3 3
C. E. 105, 106, 145 6 6 4 C. E. 143, 146, 147 3 3 3
C. E. 143, 146, 147 4 3 3 Ap.St. 131, 132, 215 4 4 4
C. E. 299 1 C. E. 299 1

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SECOND YEAR

Those with B.S. Degree in Ag. E. Those with B.S. Degree in C. E.
Course F W S Course F W S
C. E. 150, 273 4 3 C. E. 211, 210, 212 3 3 3
C. E. 241, 242, 273 3 3 3 C. E. 231, 232 3 3 3
C. E. 231, 232 3 3 3 C. E. 149, 160, 245 3 3 3
C. E. 211, 210, 212 3 3 3 C. E. 273, 148 3 3 3
Agron. 107 5 Agron. 107 5
C. E. 298 1 7 4 C. E. 298 5 4 3
C. E. 299 1 C. E. 299 1

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These typical programs are suggestive only. Variations are permitted according to a student's previous training and his objectives so long as the general requirements of the department and of the Graduate School are satisfied. Similar programs may be arranged for the degrees of M.S. in Civil Engineering and Civil Engineer. These general requirements are described under "Graduate School."

Electrical Engineering

Larry S. Cole, Professor and Head of Department; Clayton Clark, Professor; Bertis L. Embry, William L. Jones, Bruce O. Watkins, Associate Professors.

The curriculum in Electrical Engineering is fully accredited by the Engineer's Council for Professional Development.

The four year program outlined below leads to the Degree of Bachelor of Science in Electrical Engineering, and is especially thorough in the field of Electronics. E. E. graduates are fully qualified for professional engineering positions in design, research and development. A thorough program of laboratory work, with excellent facilities and modern equipment, supplements the class study for effective training.

Staff
The carefully planned course of study includes mathematics and basic science, engineering science, engineering analysis and design, basic communication and humanistic—social studies. A reasonable choice of elective subjects is provided to allow the student to pursue studies of special individual interest. Provision for additional mathematics is made for students who plan on graduate study.

A graduate course of study leading to the M.S. degree in EE. including courses number 200 and over, together with suitable related work in other departments, is offered. A typical program is listed below. This suggested course of study may be modified as required, depending on the individual student's preparation and objectives.

**ELECTRICAL ENGINEERING CURRICULUM**

Degree: Bachelor of Science in Electrical Engineering

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Suggested Course of Study Leading to the Degree of Master of Science in Electrical Engineering

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*Electives must be approved by Department Head.
#May be selected from the following: history, economics, government, literature, philosophy, or fine arts.
Courses

21. Fundamentals of Electricity. A service course for students in Industrial Arts Automotive, Welding, etc. Basic principles of practical and applied electricity; DC and AC circuits; power; wire and wiring; motor, generator and transformer principles; batteries; meters. Prerequisites: Math. 34 or equivalent. Three lectures. (3F, 3W, 3S) Staff

26. Electrical Engineering Orientation. A preview of the preparation for, and the entrance into, the Electrical Engineering profession. Computation practice in E.E. problems utilizing the slide rule and elementary mathematics. One lab. (1S) Staff

79. Introduction to Electrical Engineering. Fundamental concepts; elementary electric circuit analysis; electrical components; electrical power sources and fundamentals of electric and magnetic fields. Prerequisite (or concurrent registration in), Math. 98 calculus. Three lectures. 1 lab. (4F) Jones

80. Direct Current Circuits. Applications of Ohm’s Law, Kirchoff’s Laws, and network theorems to the solution of DC circuits; introduction to magnetic and electric fields and circuits. Prerequisite: Math. 98. Three lectures, 1 lab. (4W) Watkins

81. Alternating Current Circuits. Fundamentals of AC; application of vector algebra to solution of AC circuits; application of network theorems to AC circuits; resonant circuits; introduction to reactive matching networks; elements of complex wave analysis. Prerequisite: E.E. 80. Three lectures, 1 lab. (4S) Watkins

101. Electronics. A special course for senior or graduate science majors and non-electrical engineers. Fundamentals of electric and electronic circuits; applications to the electrical measurement of physical quantities. Prerequisites: Physics 21 and elementary calculus. Three lectures, one lab. (4F) Jones

104. Fundamentals of Electrical Engineering—Circuits. For non-electrical engineers Principles and analysis of DC and AC circuits. Electric and magnetic fields and circuits. Prerequisite: calculus and physics 21. Two lectures, one lab. (3F) Embry


107. Electrical Machinery I. An introductory course covering the basic principles of Electrical Machinery; magnetic circuits; DC machines; AC power circuits, polyphase circuits, power transmission and distribution. Prerequisite: E.E. 81. Three lectures, one lab. (4F) Embry

108. Electrical Machinery II. A continuation of E.E. 107 with special emphasis on AC machines. Transformers; single and polyphase systems and machines; control equipment. Three lectures, one lab. (4W) Embry

110. Lines and Filters. Principles and characteristics of transmission lines, networks, matching sections and filters. Prerequisite: E.E. 81. Three lectures, one lab. (4S) Cole

120. Antennas. Fundamentals of radio antennas, radiation and wave propagation; directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisite: E.E. 110. Three lectures, one lab. (4S) Clark
124. **Electron Tubes.** Fundamentals of thermionic emission and operation of vacuum and gas-filled tubes; basic principles and methods of analysis of electron tube circuits; measurements and testing in electronic circuits; elements of power supply design. Prerequisite: E.E. 81. Three lectures, 1 lab. (4F)

**Jones**

125. **Electron Tube Circuits I.** Principles and design of R-C and transformer coupled amplifiers; class A, AB, and B power amplifiers; principles of inverse feed-back; distortion and gain measurement techniques. Prerequisite: E.E. 124. Three lectures, one lab. (4W)

**Cole**

126. **Electron Tube Circuits II.** Principles and design of RF voltage and power amplifiers; neutralization methods; modulation; RF oscillators; detectors. Prerequisite: E.E. 125. Three lectures, one lab. (4S)

**Watkins**

129. **Electroacoustics.** Elements of architectural acoustics; principles of direct radiator and horn loudspeakers; microphones and pickups; recording equipment and methods; audio system planning and design; acoustic and special audio measurement problems. Prerequisite: E.E. 125. Three lectures, one lab. (4W)

**Cole**

131. **Transient Analysis.** Elementary study of transient phenomena in linear systems; formulation of differential equations and their solutions. Includes an introduction to the Laplace transform method of solution. Prerequisite: E.E. 110 and Math. 110. (3F)

**Cole**

139. **Fundamentals of Electric Waves.** Introduction to vector analysis; elementary electromagnetic field theory; Maxwell's equations; radiation and wave guides. Prerequisite: E.E. 110 and Math. 110. (3F)

**Clark**

140. **Pulse Techniques.** Principles and design of pulse and wide band amplifiers; pulse generators, multivibrators and related circuits. Prerequisites, E.E. 131, 139. Three lectures, 1 lab. (4W)

**Clark**

141. **Microwaves.** Fundamental principles of microwaves, generators and cavity resonators; wave guides, parabolic and horn radiators; microwave transmission and propagation; measurements in the microwave region. Prerequisite: E.E. 140. Three lectures, one lab. (4S)

**Clark**

150. **Instruments and Measurements.** A laboratory course covering the principles and application of electrical and electronic instruments; methods and techniques of measurements. Prerequisite: E.E. 124. Two labs. (2F, 2W, 2S)

**Jones**

151-2-3. **E.E. Project Laboratory.** Individual engineering assignments involving design, development, construction and testing of various types and units of electronic and communication equipment. A formal engineering report is required on each project. Prerequisite: Senior standing in E.E. Two labs. (2F, 2W, 2S)

**Cole, Clark**


**Watkins**

175, 176, 177. **Electrical Engineering Seminar.** A weekly meeting of staff and senior E.E. majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents a technical paper on a suitable topic. (1F, 1W, 1S)

**Staff**

180. **Transistors.** An introduction to the theory, principles and characteristics of transistors. Fundamental applications of transistors; circuitry analysis and design. For senior or graduate E.E. majors. Prerequisite: E.E. 132 and physics 91. Three lectures, one lab. (4S)

**Jones**

200. **Special Studies in Electrical Engineering.** Preparation of professional papers and reports, research, and special problems. Open to senior E.E. students of high standing or graduate students. Time and credit arranged. (2F, 2W, 2S)

**Staff**

211, 212. **Advanced Electron Tube Circuits.** Pulse techniques and recurrent electrical transients. Generator, trigger, multivibrator and similar circuit theory and design. Theory and design of high-speed pulse amplifiers. Wideband and bandpass amplifiers. Amplifier noise problems. Prerequisite or concurrent registration in E.E. 131 or equivalent. Three lectures, one lab. (4F, 4W)

**Cole**
Network Synthesis. The mathematical basis and design methods for two and four terminal passive networks having physically realizable driving point imitations. Prerequisites: Math. 254 and E.E. 131. Three lectures. (3W, 3S)


Servo-Mechanisms and Automatic Controls. Basic theory and design of servo systems. Transient response and stability problems. Computer fundamentals. Prerequisite: E.E. 131 or equivalent. Three lectures, one lab. (4S)

Graduate Thesis. Time and credit arranged. Each quarter.

Tool Engineering

Frederick Preator, Professor and Head of Department; Rawson D. Child, Ross W. Eskelson; B. O. Willhite, Assistant Professors.

The department offers a four-year curriculum that leads to the degree of Bachelor of Science in Tool Engineering. The present demand for capable tool engineers is greater than the supply of personnel qualified to take over production responsibilities.

Tool Engineering is a branch of engineering devoted primarily to planning the processes of economic manufacture; the art and science of analyzing, planning, designing, construction, and producing tools for manufacturing industries. The tool engineer handles the more specialized activities of process engineering, machine design, tool design, plant and layout engineering, gage engineering, manufacturing cost estimating, machine tool building, and maintenance engineering.

The Tool Engineering laboratories are equipped with eighteen engine lathes, three universal and one vertical milling machine, one planer, three shapers, four precision tool grinders, six drill presses, five tool grinders, one carbide tool grinder, one Doall machine, two punch presses, and one power hack saw. The laboratory is well supplied with all the necessary hand tools for precision work. The heat treatment laboratory is equipped with five electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. A modern inspection laboratory has gage blocks, sine bars, electric comparators, polishing heads and microscopes for mechanical inspection work.

A joint program of cooperative training with Utah industries has been worked out for advanced students which permits registration for summer periods. Field trips to industrial plants are conducted each year for junior and senior students.

Student Chapter No. 2 of the American Society of Tool Engineers, promotes the professional and social interests of the tool engineering majors. Members of the teaching staff are qualified members of the national society.

TOOL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Tool Engineering

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1 and 2 See footnotes page 169.
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### Courses

**50. Orientation.** Lectures, films, and field trips to acquaint the student with diverse opportunities for the tool engineer in industry. 

**51, 52. Machine Tool Operation.** Training in the use of hand tools, and bench work and tool sharpening, together with elementary training on drill press and engine lathe. Reading assignments on machine tool operations, and applications of mathematics to machine tool problems are included. 

**53, 54. Machine Processes.** Introduction to work on the shaper, planer, and milling machines prepares the student for advanced operations. 

**55. Machine Lab for Engineers.** Acquaints engineering students with basic machine tool operations. 

**56. Manufacturing Processes.** Teaches the student the fundamentals of such manufacturing processes as foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; shows possibilities and limitations of these processes and their application to fabrication of industrial products. 

**150. Engineering Metallurgy.** Physical properties, composition, constituents, and heat treatment of metals used in industry, including cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. 

**151. Tooling Operations.** Develops for the student an understanding of the capacity and versatile usefulness in production operations of the fundamental machines and equipment used in the manufacturing operations. 

**152. Tool Planning.** Analysis machining processes and organization of operational sequence. 

**153. Tool Processes.** Introduction to tool and gage and die processes. The student studies and makes specialized tools and equipment necessary for the design and construction of projects in the tool and die industry. 

**158. Manufacturing Analysis.** Economics of tooling operations; the productivity of machines, different tooling methods, fabrication techniques, breakdown of operations, tool maintenance, tool costs, and job estimating.
181, 182. Tool Design. The study and design of such production tools as gages, jigs and fixtures, punches and dies. Includes tool design standards, tolerances, springs, details of jigs, cam layouts, and techniques of preparing tool drawings. Each student designs and constructs a set of tools for production of a specific workpiece. Emphasis on development of creative ability and originality. Prerequisite: C.E. 103. Two lectures, three labs. (5F, 5W)

Preator; Child

183. Plant Layout. Study of the utilization of space, machining, and equipment for economical production in manufacturing operations. Laboratory consists of organizing and planning details for layout of production operations. Two lectures, three labs. (5S)

Preator

184. Seminar. A review of current technical literature dealing with the latest production methods. Oral and written reports presented for discussion. (1W, or S)

Preator

185, 186. Co-operative in Plant Training. A co-operative training course conducted by the college and industry to supplement the student’s academic work with plant experience and to qualify him for industrial opportunities. Arranged (6).

Staff

TWO-YEAR CURRICULUM LEADING TO CERTIFICATE OF COMPLETION IN MACHINE TOOL TECHNOLOGY

The two-year terminal curriculum prepares young men who have mechanical interests and abilities to become skilled craftsmen and technicians. Operations performed in the two-year terminal course are the same as those required in industrial shops. Mechanical drawing and blueprint reading are essential in the Machine Tool curriculum. Capable and efficient craftsmen are rarely out of employment in the manufacturing industries.

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<th>Second Year</th>
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Engineering Experiment Station

J. E. CHRISTIANSEN, Director

By act of the Board of Trustees of the Utah State Agricultural College, December 2, 1918, the Utah State Engineering Experiment Station was established to serve the State in a manner broadly outlined as follows:

(1) To serve those industries and utilities affecting the agricultural and rural populations of the State and to aid public officials and teachers by making engineering investigations of significance and interest to them.

(2) To further the development of methods of processing and use of waste products from agriculture.

(3) To develop methods of processing and making available for use the undeveloped agricultural and industrial raw materials of the State.

(4) To further develop the science of Irrigation and Drainage to the end that the land and water resources of the State may be most fully utilized.

(5) To stimulate a greater use of native materials in rural housing and farm structures.

(6) To develop applications and uses of power equipment and to help solve problems relating to the water supply and sanitation of the farm home.

(7) To develop new tillage, harvesting, and weed control equipment.
(8) To develop new methods and uses of native materials in the construction of farm-to-market roads and highways.

(9) To cooperate with the Federal government in the conducting of investigations along these and other lines of engineering in harmony with the functioning of the Land-Grant College.

(10) To publish and distribute through bulletins, circulars, and technical articles in periodicals the result of such studies, surveys, tests, investigations and researches as will be of greatest benefit and interest to the people of Utah.

The Engineering Experiment Station is an integral part of the School of Engineering and Technology, and the laboratory facilities and shops of the School of Engineering are available for the investigational work of the Station to extent of sums allocated for their operation and support.

The Dean of Engineering is Director of the Station; and the staff consists of members of the teaching staff, School of Engineering and Technology.

DIVISION OF TECHNOLOGY

The Division of Technology includes four departments: Aeronautics, Automotive, Industrial Education and Welding. Beginning as a Department of Mechanic Arts in 1888, the division has expanded and developed as a result of efforts of the College to provide for the "liberal and practical education of industrial classes" as outlined in the original charter for Land-Grant Colleges and Universities.

This division offers three major programs:

I. Industrial Technology Program. Present-day industry requires services of engineers, technicians, and skilled craftsmen. The Industrial Technology program is a four-year technical program leading to the degree of Bachelor of Science in Industrial Technology. The training provided combines technical knowledge and manual skills with a broad general college education. This program prepares technicians for technical, supervisory, or managerial positions in modern industry and is an excellent foundation for entrance into industrial Civil Service positions, or for private business. Prescribed curricula under this program are described under the departments in which they are offered.

II. Industrial Education Program. This program, offered by the Department of Industrial Education, gives professional training for teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and the Summer Season. Completion of the under-graduate curriculum leads to the degree of Bachelor of Science in Industrial Education with majors in Industrial Arts Education for junior and senior high school positions, and Trade and Industrial Education for junior college and vocational school positions. Graduate study leading to the degree of Master of Science in Industrial Education is also offered.

III. Vocational Technical Program. This program prepares skilled technicians for modern industry. Completion of the two-year curricula, listed under the departments in which they are offered, leads to a Certificate of Completion in the specific field. This program is briefer and more specialized than the degree program.

This program is offered in close co-operation with the State Department of Public Instruction, and with industry. Problems of training and placing of students are considered jointly with advisory committees representing the trade. Instruction covers the practices of industry with emphasis on latest methods, modern equipment, and live productive work. The instructors all have years of successful trade experience in their field.

The Vocational Technical Program offers many distinct advantages to students desiring terminal education. Students completing this program are not only well prepared with the skills of their trade to enter modern industry, but they are also prepared, through their association and activities on a college campus, to take their place in society. Students entering industry from
this training program have opportunities for further progress and advancement in industry, as has been demonstrated by many industrial leaders. By returning to this institution for further training, qualified students may apply most of the credit earned under this program toward a degree, and thus better prepare themselves for supervisory and managerial positions.

The Division of Technology, as an integral part of a Land-Grant College of Agriculture and Mechanic Arts, is providing the types of training specified in the Morrill Act of 1862, establishing the Land-Grant Colleges.

**Aeronautical Technology**

H. A. Buntine, Associate Professor and Head of Department; Lowell P. Summers, Assistant Professor; Samuel W. Merrill, Instructor.

This department offers instruction for thorough training of skilled airframe and powerplant mechanics and aeronautical technicians.

The Aeronautics Department is a fully certified Air Agency complying with Civil Aeronautics Authority regulations and holds Certificate No. 1175 covering training of combined Airframe and Powerplant Mechanics. The curricula, equipment, and instructors have been properly certified in compliance with regulations for the training of Airframe and Powerplant Mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Airframe and Powerplant mechanic ratings. This training prepares graduates for both airframe and powerplant maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in aeronautics with a general college education. Training is based upon the objective of scientifically and systematically developing students to a point where they can assume responsible positions in the industry. Students graduating in the four-year curriculum are required to have successfully accomplished the written and practical C.A.A. examinations for Airframe and Powerplant Mechanic ratings.

Facilities include complete laboratories and modern equipment for instruction in powerplants, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.

## CURRICULUM

**Degree:** Bachelor of Science in Industrial Technology  
**Major:** Aeronautics

<table>
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<th>Course</th>
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<td>A.S.</td>
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*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 Fall Quarter.
2-Year Vocational Program

Certificate of Completion in Airframe and Powerplant mechanics will be granted on satisfactory completion of the 2-year freshman and sophomore curriculum listed above and the Civil Aeronautics Authority's written and practical examination in Airframe and Powerplant Mechanic Ratings. Application for graduation and payment of diploma fee through the Registrar's Office is required for a 2-year certificate of completion.

Courses

5. Composite Aircraft Structure. Design, construction, repair, and maintenance of composite aircraft, including wood structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. Five lectures, five labs. (7F) Staff

6. All-metal Aircraft Structures. Design, construction, repair, and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. Five lectures, five labs. (7W) Staff

7. Aircraft Maintenance. The maintenance, repair, and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, instruments, electrical equipment and installation, and general servicing of components; rigging, weight and balance computations, periodic inspections, recording of repairs and alterations, time and material cost estimates, material and equipment requirements. Pertinent Civil Air Regulations are studied. Five lectures, five labs. (7S) Staff

8. Aircraft Powerplants. Repair, maintenance, and operation of modern air-cooled and liquid-cooled aircraft engines, including design, disassembly and reassembly procedures, special tools and their application, power sections, accessory sections, supercharger sections, cylinder and valve mechanisms, and pertinent Civil Air Regulations. Basic related material includes a study of specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, inspection methods, materials and processes, volumetric efficiency, and compression ratios. Five lectures, five labs. (7F) Summers

9. Aircraft Powerplant Accessories. Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel injection systems, lubricating systems, magnetos, generators, and voltage control systems, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism, induction systems and superchargers, fuels and lubricants. Five lectures, five labs. (7W) Summers

10. Aircraft Powerplant Maintenance. Training in alteration, maintenance and operation of aircraft powerplants, including periodic inspections, servicing, diagnosis of engine malfunctioning, and engine installation. Theory of operation and design characteristics of controllable, constant speed, hydrodynamic, electric and reversible propellers. Overhaul and maintenance of propellers. Pertinent Civil air Regulations. Five lectures, five labs. (7S) Summers
100. Fundamentals of Turbo-Jet Propulsion. History, development and general principles of jet propulsion. Thrust and performance, combustion systems metallurgy, American, British and foreign gas turbines; aerodynamic problems; application. Prerequisite: Aero. 10. Two lectures, one lab. (3F) Buntine

101. Flight Engineering. Principles underlying relationships between altitude, power output, airplane performance, and the use of engine power curves, take-off and climb charts, cruising charts and flight logs. Three lectures, one lab. (4F) Summers

102. Advanced Turbo Jet Propulsion and Gas Turbines. Extension of fundamental theory, axial and centrifugal flow compressors, gas turbines, burners, and jet propulsion. Prerequisite: Aero. 100. Two lectures, one lab. (3F) Buntine

103. Elementary Aircraft Design. Basic constructive concepts relating to aircraft design. Three lectures. (3S) Buntine


105. Aircraft Woods and Plastics. Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria. Two lectures. (2W) Staff

126. Airline Maintenance and Fixed Base Operations. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Administration; interline agreements promotion and publicity. Two lectures. (3W) Buntine

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. Two lectures. (2 FWS) Buntine

131. Time and Motion Study. Techniques of time and motion study and their inter-relationship. Detailed discussion and practice with process charts, multiple-activity charts. Threblig check list, motion economy and stop-watch time study. Methods of application and personnel problems involved. Three lectures. (3F) Staff

132. Airport Planning. The airport and the community airway and airport traffic control. Airport types, fundamental requirements, planning and construction. Lighting, building and hangar design. Special problems and miscellaneous facilities. Three lectures. (3S) Buntine

134. Aircraft Electrical Systems and Equipment. The more complex electrical systems used in larger aircraft. Three lectures, two labs. (4S) Summers

Ground School Courses

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Two lectures. (2 FW or S) Buntine

32. General Service and Operation of Aircraft. Aeronautical Ground School (Primary). Theory of flight, inspection, care and maintenance of aircraft and engines. Two lectures. (2 FW or S) Buntine

34. Navigation. Maps, charts, and navigational problems. Required by the C.A.A. for any pilot rating above private. (3 FW or S) Buntine

Flight Courses

Students interested in flight courses should take Physics 16, Introductory Meteorology which is required by the C.A.A. for pilot rating above Private Pilot Certificate.

37. Private Pilot Certificate. Flight School Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certification. Prerequisites: Aero. 31 and 32. (F W or S) Credit arranged, limit 8 credits. Buntine

Buntine

Automotive Technology

Owen Slaugh, Assistant Professor and Head of Department; Ivan E. Lee and Lynn R. Willey, Assistant Professors; Clyde Hurst, Instructor.

This department offers a Bachelor of Science Degree in Industrial Technology with majors in Automotive Technology, or Diesel Technology. It also provides general service courses for students in other departments who desire to become familiar with various phases of automobile education. In cooperation with the Industrial Education Department courses are offered in Driver Educational Teacher Training.

Training facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the most modern servicing and testing equipment, and provide ideal conditions for study.

A major in Automotive or Diesel Technology prepares a student to be a technician who can better interpret the designs of the engineers and direct the work of repairmen. This major also prepares students to become shop foremen, shop superintendents, and with special preparation, school instructors. Excellent background is provided for entrance into civil service, private business, and managerial positions with large companies.

Students desiring to more thoroughly prepare themselves for advanced or graduate study in automotive or related engineering, may do so by registering for mathematics and engineering courses as electives during their junior and senior years.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Automotive Technology

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*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.
Diesel Technology Major
Substitute Auto 21, 22, 23, 122, and 123 for Auto 1, 2, 3, 102, and 103.

Auto Body Reconditioning—Two Year
Substitute Auto 52, 53, for Auto 2; Auto 12, 13, and 16 for Auto 4, 5, and 6; Auto 62 for Chem. 12.

Two-Year Vocational Technical Program
Certificate of completion in Automotive Repair, Diesel and H. D. Mechanics, and Auto Body Reconditioning will be granted, upon application and payment of diploma fee, to students completing the Freshman and Sophomore years of the respective curricula.

Service Courses
Courses open to any students: Auto 51, 52, 53, 54, 61, 62 and 162.

Courses

1. Steering Correction. (Technical and Shop) Construction, operation, and repair of all parts of the automobile chassis. Units studied are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, and hydraulic brakes. Modern methods of repair. (6F) Lee

2. Automotive Engines. (Technical and Shop) Construction, operation, and repair of the modern automobile engine, including cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. (6W) Lee


4. Fuel Systems. (Technical and Shop.) Construction, operation, and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls and such special devices as superchargers, governors, and auto diesel engine fuel systems. Modern methods of repair. (6F) Slaugh

5. Auto Electrics. (Technical and Shop) Construction, operation, and repair of electric systems used on modern automotive equipment, including the battery, lighting system, ignition systems starting and generating systems. Modern methods of repair. (6W) Slaugh

6. Motor Tune-up. (Technical and Shop.) Correlates the work covered on engines, carburetion and electrics. Tests for troubles are made with modern tune-up equipment; these troubles remedied by trade-accepted methods. Prerequisites: Auto 2, 4, 5. (6S) Slaugh

12. Fender Reconditioning. (Technical and Shop.) Roughing out, shrinking, leading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfaces. (6F) Willey

13. Body Reconditioning. (Technical and Shop.) Construction and repair of automobile bodies. Units include checking and alignment of automobile bodies and repair and replacement of damaged body panels such as the dash, cowl, trunk, rocker, floor, side, top and door panels. Prerequisite: Auto 12. (6W) Willey

16. Automotive Refinishing. (Technical and Shop.) Preparation of body metal and application of lacquer and synthetic enamels, including metal preparation, and repair of automotive diesel and heavy-duty chassis. Units covered are preparation, priming, surfacing, and application of color. Practice in spotting, stripping, and graining. (6S) Willey

21. Heavy Duty Chassis. (Technical and Shop.) Construction, operation, and repair of automotive diesel and heavy-duty chassis. Units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (6S) Hurst
22. Automotive Diesel Engines. (Technical and Shop.) Construction, operation, and repair of automotive diesel engines, including two-stroke cycle and four-stroke automotive, truck and tractor engines and their accessories. (6W) Hurst

23. Heavy-Duty Drives. (Technical and Shop.) Construction, operation, and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (6F) Hurst

51. Automobile Chassis. Principles and practice in construction, operation, and servicing of the modern automobile chassis. Units of the course include axle, wheel suspension, steering gears, frames, springs, universals, drive shafts and brakes. Open to any college student. Two lectures, two 2-hr. labs. (3F) Hurst

52. Automobile and Farm Power Plants. Principles and practice in construction, operation and servicing of the modern automobile and farm power plants. Units of the course include cylinder block assemblies, piston assemblies, crankshaft, assemblies, valve assemblies, clutches, transmission, overdrive, fuel, cooling and lubrication systems. Two stroke, four stroke and diesel cycles considered. Open to any college student. Two lectures, two 2-hr. labs. (3S) Lee

53. Automobile and Farm Engine Electricity. Principles and practice in the construction, operation, and servicing of electrical systems used on modern automobiles and farm engines. Units studied include starting, generating, lighting, ignition, and special accessory systems. Open to any college student. Two lectures, two 2-hr. labs. (3W) Slaugh


61. Body and Fender Repair. Principles and practice in fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. Two lectures, two 2-hr. labs. (3F, S) Willey


101. Frame, Suspension and Steering Systems. (Technical and Shop.) Geometry and design factors of the various types of steering units including power steering, differential and brake steering, wheel balancing, frame alignment, and power brakes are studied in relationship to steering facility. Prerequisite: Auto 1, Math. 34, 44. (3W) Hurst

102. Internal Combustion Engines. (Technical and Shop.) Design and operational characteristics of different engine types. Attention is given such items as combustion chamber design, precision cylinder and bearing boring, engine balancing, valve actuating mechanisms, determination of bearing loads, inertia and centrifugal forces and production of engine parts. Prerequisite: Auto 2, Math. 35, 44. (3W) Lee

103. Automatic Transmission. (Technical and Shop.) Development of fluid couplings, torque converters, transmissions, electric clutches, and hydraulic valve control systems. Tests and trouble diagnosis procedures emphasized. Prerequisite: Auto 3. (3W) Hurst

122. Fuel Injection Systems. (Technical and Shop.) Design, operation, and servicing of diesel and gasoline injection systems. Includes air and solid types injection. Turbulence requirements of induction are considered. Prerequisite: Auto 22, Physics 19. (3W) Hurst

123. Hydraulic Drives and Special Differentials: A study of history and development of hydraulic clutches and transmissions used on trucks and buses. Consideration is given to unique gear designs, strength tests of materials, torque arms, radius rods, angular drives, and the evolution of differential gear design. (3S) Hurst

151. Carburetion. Technical training in fuels and combustion processes related to internal combustion engines. Emphasis is given to cycle analysis and associated carburetor problems affecting combustion. Prerequisite: Auto 4 or equivalent. Two lectures, one 3-hr. lab. (3F) Slaugh

152. Motors, Generators, and Magnetos. Technical training in construction and operation of electrical testing equipment used with the major electrical units of the automobile. Emphasis is given in industrial testing procedures and practices. Principles and practices in construction, operation, and repair of magnetos. Prerequisite: Auto 53 or equivalent. Two lectures, one 3-hr. lab. (3W) Lee

154. Seminar and Special Problems. A systematic review of the automotive field with discussions and reports on recent developments. Lab. analysis of special problems encountered in automotive work. Prerequisites: Auto 151 and 152. Two lectures, two 2-hr. labs. (3S) Slaugh

162. Metal Refinishing. Principles and practice in preparing metal for refinishing. Fundamental procedures in priming, surfacing, and applying lacquer, enamel, and other special finishes. Two lectures, two 2-hr. labs. (3F, 3W) Willey

Industrial Education

William E. Mortimer, Professor and Head of Department; Charles N. Merkley, Associate Professor; Dan H. Swenson, Charles W. Hailes, Lynn Willey, Assistant Professors; H. M. Wadsworth.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. It also offers training for management positions in industry. In addition, courses in woodwork and building construction are offered in this department. Students who complete their undergraduate courses receive a Bachelor of Science degree in Industrial Education with a major in Industrial Arts Education, Trade and Industrial Education, or Industrial Management. Those completing the curriculum in Woodwork and Building Construction receive a Bachelor of Science Degree in Industrial Technology with a major in Building Construction.

The Master of Science degree in Industrial Education is offered with majors in Industrial Arts Education or Trade and Industrial Education or Industrial Management. All courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments except I.E. 112, 113, 121, 129, 141, 142, 143, 144, 145, 161, 162, 163, 171, 172, 173, and 174. Courses in the 200 series are intended strictly for graduate work. Registration in these courses requires approval of the major professor and the instructor concerned. None of the courses in Woodwork and Building Construction are applicable to the Masters Degree.

INDUSTRIAL ARTS

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Class A Industrial Arts certificates, and is composed of courses in Arts and Science, Education, Industrial Arts Technical and Professional, and basic shop skills. The catalog description of each course in the curriculum is printed in the description of courses for each department offering the various courses.
## CURRICULUM

### Degree: Bachelor of Science in Industrial Education

#### Major: Industrial Arts Education

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### TRADE AND INDUSTRIAL EDUCATION

Designed primarily for instructors and supervisors in Vocational Technical Education and/or Vocational Industrial programs. A candidate for the degree of Bachelor of Science in Industrial Education must show evidence of successful trade and teaching experience, together with the general education requirements necessary for state certification in his field. Observation and directed teaching in the major and minor subjects may be substituted for teaching experience. The trade and teaching experience must be approved by a committee consisting of the department heads concerned.

## CURRICULUM

### Degree: Bachelor of Science in Industrial Education

#### Major: Trade and Industrial Education

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*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.*
## UTAH STATE AGRICULTURAL COLLEGE

### Course

#### Junior

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If a high school teaching certificate is desired, Educ. 114 and Public Health 155 must be included among the electives.

### INDUSTRIAL MANAGEMENT

The degree program in Industrial Management provides courses in executive development for people who desire to prepare for supervisory and executive work in industry, and who have a foundation of training in technology or engineering.

In addition to completing the required curriculum in college it is recommended that the student have at least thirty weeks of practical work experience in industry. This is made possible during the summer through a cooperative arrangement with industrial organizations in the region.

### CURRICULUM

**Degree:** Bachelor of Science in Industrial Education  
**Major:** Industrial Management

#### Freshman

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**Work experience in Industry, 10 wks.**

#### Sophomore

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**Work experience in Industry, 10 wks.**

#### Junior

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**Work experience in Industry, 10 wks.**

#### Senior

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### WOODWORK AND BUILDING CONSTRUCTION

This program offers courses in the fundamentals of woodworking, building construction, estimating and contracting, cabinet work, wood finishing and home mechanics. It offers a curriculum leading to the degree of Bachelor of Science in Industrial Technology with a major in Building Construction. It also provides general courses for any student desiring work of this nature and for students registered in Industrial Arts Education who need woodwork in their curriculum.
## CURRICULUM

Degree: Bachelor of Science in Industrial Technology  
Major: Building Construction

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**Two-year Vocational Technical Program**

Certificate of Completion in Carpentry will be granted, upon application and payment of diploma fee, to students completing the Freshman and Sophomore years of the curriculum. Some substitutions of specific courses will be allowed with the approval of the Department Head and Dean.

### Courses

**6. Applied Shop Mathematics.** Simple mathematical formulas are used in solving problems in mechanical work. These include speed ratios, steel square, micrometer reading, and area and volume problems. Prerequisite: High school algebra and geometry. Three lectures. *(3F or W)*  
*Swenson*

**13. Driver Training.** For persons who desire to learn to drive an automobile correctly and safely. Traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; general mechanics, operation, and servicing of automobile; highway safety engineering; and actual supervised training in dual-control cars. Two lectures, lab arranged. *(2F, S)*  
*Willey*

**21. Industrial and Labor Relations.** The nature and problems of the employee classes today; and nature and problems of industry and management in America; the principles, objectives and processes of collective bargaining; government policies; and the economics of income and security. An orientation course for students preparing for industry and business. Three lectures. *(3F, S)*  
*Staff*

**30. Building Maintenance.** Discussion of materials used in maintaining modern school buildings and their proper use. Required of all persons doing part-time custodial work on campus. Two lectures, lab arranged. *(3F, W, S)*  
*Wadsworth*

**40. Sheet Metal.** Fundamental operations and tool processes of sheet metal-work. Articles are made from black iron, galvanized iron, and bright tin that give practice in pattern developing, cutting, soldering, seams, riveting, and wiring. Two 3-hour labs. *(2F)*  
*Hailes*
60. Elements of Plumbing. Includes specifications, codes, layouts, installations, inspections, cutting and fitting pipe, and repairs. One lecture, one lab. (2S) Merkley

61. Fundamentals of Woodwork. Study and practice in the use and care of hand tools including the sharpening of tools, and a study of the fundamental hand tool processes. An introduction to the use of common woodworking machines is included. Practice in wood construction is provided through the building of projects. Three labs. (3F) Swenson

62. Machine Woodwork. A study of safety measures, use and care of all of the common woodworking machines including the sharpening of machine cutters and other machine maintenance problems. A study of woods and various other materials related to wood construction is included. Practical experience is provided through student-constructed projects. Prerequisite: I.E. 61. Three labs. (3W) Swenson

63. Advanced Woodwork. The design and construction of furniture and other advanced projects provides additional experience and practice in both hand tool and machine processes for students who have completed I.E. 62 or who have had considerable woodworking experience. Problems related to furniture and other fine wood construction are made a part of the course through assigned reading, lecture and class discussion. Prerequisite: I.E. 62. Three labs. (3S) Swenson

64, 65, 66. Building Construction. Laying out and constructing buildings, stressing carpenter work. Includes concrete forming, framing, roof framing, roofing, scaffolding, siding, exterior and interior trim, window and door work. Special attention is given to trade construction methods. Prerequisite: I.E. 63. Three labs. (3F, 3W, 3S) Merkley

68. Practical Electric Wiring. For students in building construction courses. Covers the national electrical code and local codes in Utah communities. Includes choice of materials, design of circuits and inspection for electrical heat, light, and power installation in homes and small public buildings. Two lectures, one lab. (3W) Swenson

70. Wood Finishing. Fine wood finishing such as natural finished, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, and stucco paints. Students are required to practice in each type of finishing. Two lectures, three 1-hour labs. (3F, W, or S) Staff

72. Concrete and Masonry Products. Composition of concrete for various purposes. Masonry composition and construction; their strength and thermal conductivity. Projects are built in the laboratory during the course. One lecture, one lab. (2F) Merkley

73. Materials of Industry. Wood and wood products, commercial veneered panels, roof coverings, wall boards, insulating materials, siding, composition panelings, glass products and other non-metal materials used in building trades. Three lectures. (3W) Merkley; Mortimer

74. Woodwork for Everyone. This class is open to all who have a desire to work with wood, both men and women. Instruction is given in the fundamentals of woodwork and includes training in the use of both hand tools and woodworking machines. Projects are selected and built by students; a wide latitude in the selection of projects is afforded. Special emphasis is given to wood turning. Instruction is also given in furniture repair and in the basic principles of woodfinishing and re-finishing. Five labs. (2-5 F, W or S) Staff

102. Instructional Aids. Instruction in the purpose, types, sources, preparation and proper use of audio and visual aids, including samples, models, charts, graphs, slides, still film, movie film, sound film, and other aids suitable for classroom and auditorium use. Prerequisites: I.E. 107 and 129. Three lectures. (3W) Staff

104. Occupational Analysis. Principles and practice in analyzing occupations in order to determine teaching content. Students complete an analysis of one unit for a trade or occupation. Three lectures. (3 Arr.) Staff
107. Principles and Objectives of Industrial Education. Philosophy and purposes of Industrial Education. Students study and compare general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three lectures. (3F) Mortimer

110. Shop Organization and Management. Teaches students to organize and manage an Industrial Education shop of the unit, general, or multiple activity type. Each student prepares, 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. Prerequisites: I.E. 107, 129. Three lectures. (3W) Hailes

111. The General Shop. Comprehensive study of the types of “General Shop,” its advantages and applications; content and organization of subject matter; methods of teaching and shop plans. General shop projects, shop plans and new trends in content and equipment are given special consideration. Prerequisite: I.E. 107. Three lectures. (3 Arr.) Mortimer; Hailes

112. Observation and Directed Teaching. Students observe and teach in Industrial Arts shops throughout the state. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the state in junior and senior high schools. (8W) Mortimer; Hailes

113. Driver Education and Traffic Safety. To acquaint prospective teachers and others with available instructional materials for driver education and the latest methods of presenting these materials in the classroom and on the road. Supervised practice is arranged for each student. (3F, or S) Willey

117. Foremanship and Supervision. A comprehensive study of the place and functions of the foreman or supervisor in industry and business. Emphasizes foremanship as an important part of management. Provides the practical information a foreman or supervisor needs in his work. Prerequisite: I.E. 120. Three lectures. (3F) Staff

119. Job Evaluation and Wage Incentives. The place of job evaluation and wage incentives and their use in successful management. How to set up these techniques and put them into operation. A practical course for both students and employed personnel for direct application in all levels of management. Prerequisites: I.E. 120 and 117. Three lectures. (3S) Staff

120. Personnel Relations. Training for leadership in industry as foremen, supervisors, and directors. Problems in organizing, supervising, training, and directing personnel. Directed conferences based on student experiences and directed studies in leadership problems and principles. Three lectures. (3F or S) Staff

121. Methods in Industrial Education. Latest techniques of teaching applied to individual and group instruction in Industrial Education. Each student has opportunity to use these different methods in presenting lessons before the class. Prerequisites: I.E. 107, 129. Three lectures. (3W) Mortimer

123. Curriculum Problems in Industrial Arts. To teach prospective junior high school Industrial Arts instructors the application of skills and knowledge acquired in basic shop courses. Each student constructs projects suited to the work recommended by the State Department of Education. He prepares lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisites: I.E. 129 and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. Three lectures, three 3-hour labs. (6S) Mortimer; Hailes

124. History of Industrial Education. Historical developments of manual and industrial education from the early leaders to the present. Emphasis is given to the influence that various leaders and movements, in both Europe and America, have had upon present-day objectives of industrial arts and vocational industrial education. Three lectures. (3F) Mortimer
129. Organization and Development of Instructional Materials. Selection and arrangement of teaching materials to be used in industrial arts and trade and industrial shop work. Three lectures. (3F) Mortimer

141. Art Metalwork. Laboratory work in embossing, sinking, engraving, etching, and metal spinning operations. Work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Tool Technology. Three 3-hour labs. (3S) Hailes

142. Plastics. Acquaints students with the new and important group of plastic materials now produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. Special emphasis is given to the place of plastics in modern industrial arts programs. Three 3-hour labs. (3F) Hailes

143. Recreational Crafts. Especially for students majoring in recreational leadership. Consists of: (1) planning and organizing craft work as part of community recreational programs, (2) laboratory work in crafts, such as wood, leather, plastics, metals, and others. Two 3-hour labs. (2S) Hailes

144. Foundry Principles and Practices. Principles and practices of basic foundry work. Castings will be made using common non-ferrous metals, such as aluminum, copper, brass, and bronze. Two 3-hour labs. (2F) Hailes

145. Industrial Arts Applied Electricity. Provides the prospective teacher with an understanding of how the basic principles and applications of electricity in the home and in industry should be prepared for the industrial arts program of secondary schools. Prerequisite: E.E. 21. One lecture, two 3-hour labs. (3F)

161, 162, 163. Advanced Building Construction. Estimating and contracting. Construction and design of homes, farm buildings and apartments. Covers porch work, stairways, dormers, special roofs, insulation and other special construction, specification writing, cost estimating, construction methods, allowable loads, and drawing of special sections and details. Problems in actual bidding on sets of plans are worked out by students. Prerequisites: I.E. 66, E.D. 94. Three lectures, two labs. (5F, 5W, 5S) Staff

167. Special Problems in Industrial Education. For qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Time and credit arranged. Staff

171, 172, 173. Cabinet Work. Design and construction of furniture and cabinets, including a study of wood suitable for furniture and cabinet making, wood turning, inlaying, and types of wood finishing. Projects are built which include inlaying and overlaying. Prerequisite: I.E. 63. (3F, 3W, 3S) Merkley, Swenson

180. Industrial Arts for Elementary Schools. Objectives and theory of Industrial Arts in the elementary school. Suitable instructional content will be presented for each grade level and methods of teaching and organizing instructional materials will be carefully considered. Instruction is given on the use of tools and materials in the shop where projects suitable for the elementary school will be constructed from modern industrial materials. Two lectures, one lab. (3W) Staff

174. Art Woodwork. Decorative means that craftsmen employ for artistic appeal. Art turning, chip carving, band saw shaping, scrolling, twisted turning, inlaying and overlaying. Consideration is given decorative effects obtained by two-tone staining, bright colored stains and lacquers, burning and fine polishing. Prerequisite: I.E. 63. Two 3-hour labs., one lecture. (3F) Mortimer; Merkley

184. Ornamental Iron Work. Designing and making of iron furnishings in harmony with modern design and techniques for both interior and exterior use. Wrought iron furniture, railings, etc., will be planned and constructed. Prerequisite: Basic course in Welding. 2 Labs. (2S) Staff

207. Philosophy of Vocational Education and the Practical Arts. Designed to enrich and expand the student's understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. Prerequisite: I.E. 107 or equivalent. Three lectures. (3 Arr.) Staff
209. Course of Study Building in Industrial Education. Teaches students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, reference, tests, and instructional schedule. Each student completes this work for one unit of instruction. Prerequisite: I.E. 107. Three lectures. (3 Arr.) Mortimer

251. Administration and Supervision of Industrial Education. The laws, regulations, and policies affecting Industrial Education programs; organization, supervision, and management necessary for successful operation of these programs. Three lectures. (3 Arr.) Staff

254. Measurement in Industrial Education. Construction and use of the various types of tests and rating scales used in Industrial Education. Emphasis is placed upon 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 are covered. Prerequisite: Psychology 102. Three lectures. (3 Arr.) Mortimer

255. Techniques in Writing Instruction Sheets. Principles underlying development of instruction sheets for use in industrial arts and trade and industrial education programs. Prerequisite: I.E. 129. Three lectures. (3 Arr.) Staff

259. Planning and Equipping School Shops. Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. For administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students study basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to solution of their particular problems. Prerequisite: I.E. 110. Three lectures. (3 Arr.) Staff

261. Part-time Education. Content, methods, and special devices to be used in part-time education programs. Emphasis upon pertinent problems and their solutions. Workshop or lecture. (3 Arr.) Staff

263. Evening School Programs. Development, organization and improvement of evening school programs in Industrial Education. Workshop or lecture. (3 Arr.) Staff

264. Conference Leading. Principles and practice in conference leading applied to methods used in industry. Emphasis given to preparation, use and evaluation of this method as it affects industrial education programs. Workshop or lecture. (3 Arr.) Staff

265. Apprenticeship. Development, organization, and improvement of apprentice training programs for industry. Workshop or lecture. (3 Arr.) Staff

266. Related Instruction. Content, methods and special devices used in teaching related subjects in vocational programs. Emphasis on pertinent problems and their solutions. Workshop or lecture. (3 Arr.) Staff

267. Reading and Conference. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of the department head; investigation is carried on under direction of the major professor. (Arr.) Mortimer

270. Seminar in Industrial Education. Gives opportunity for investigation and reporting of individual problems. (1-2 Arr.) Mortimer

271. Research and Thesis Writing. Provides for individual work in thesis writing in industrial education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arr.) Mortimer

290, 291, 292. Advanced Studies Under Plan “B.” Special library and seminar problems or studies designed to meet requirements for reports under plan “B.” (2-3 Arr.) Mortimer
WELDING

A. B. Kemp, Instructor and Head of Department.

Modern manufacturing methods of today require the services of the welding engineer, technician, and skilled craftsman.

The Welding Department provides progressive instruction in welding to supply the demands of industry with four-year curricula leading to degrees in Welding Engineering and in Industrial Technology, and a two-year curriculum leading to a Certificate of Completion.

Trained men in all three fields are in great demand by all manufacturers of metal products. Service courses are offered to all on the campus who wish to explore this field of science.

WELDING ENGINEERING CURRICULUM

Degree: Bachelor of Science in Welding Engineering

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WELDING TECHNOLOGY CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Welding Technology

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1 and 2 See footnotes page 169.
## Two-Year Vocational Technical Program

### Certificate of Completion in Welding

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### Courses

In all of the following courses, various techniques and welding positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

41, 42, 43. **Acetylene Welding.** Acetylene welding of ferrous and non-ferrous metals as used by industry. (5F, 5W, 5S)  Staff

44, 45, 46. **Electric Welding.** Electric welding as used in industry, (5F, 5W, 5S)  Kemp

91. **Acetylene Welding.** Principles and practice in fundamentals of oxy-acetylene welding and cutting. A general service course open to all college students. Two lectures, two 2-hour labs. (3F, 3W, 3S)  Staff

92, 93. **Aero Welding.** Principles and practices in fundamentals of aircraft welding. Prepares for C.A.A. tests. (3W, 3S)  Staff

94. **Electric Welding.** Principles and practices in use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc welding of steels. Two lectures, two 2-hour labs. (3F, 3W, 3S)  Kemp

96. **Engineers’ Welding.** Exploration in Modern Welding. Students receive basic instruction and practice in use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. (3S)  Kemp; Staff

153, 154, 155. **Advanced Acetylene Welding.** Hard surfacing, special bronzing problems, pipe welding, and other problems. Qualifies for code tests. Prerequisite: Weld. 43 or 92. (3F, 3W, 3S)  Staff

161, 162, 163. **Advanced Electric Welding.** Special problems in arc-welding and qualifies students for code test. Prerequisite: Weld. 46. (3F, 3W, 3S)  Kemp

190. **Advanced Acetylene Welding.** Vertical and overhead steel welding. Special problems. Prerequisite: Weld. 91. (3F, 3W, 3S)  Staff

191. **Advanced Electric Welding.** Vertical and overhead arc-welding. Special problems. Prerequisite: Weld. 94. (3F, 3W, 3S)  Kemp

193. **Welding Seminar.** Current Topics in production methods, cost, design, and manufacture of welded products used in modern industry. (2S)  Kemp

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1 See footnotes page 169.
SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT

LEWIS M. TURNER, Dean

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Range Management ......................................................................... 205
Wildlife Management ..................................................................... 208
General Information

The comparative newness of 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 enter these fields of public service. The purpose of this school 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 School 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. Forests and range lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of the school, the Bear River Migratory Bird Refuge within 40 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 a half day to one day’s driving distance.


RECOMMENDED ENTRANCE QUALIFICATIONS

Normally, graduation from high school is prerequisite to entrance in the school. Veterans and certain others, not high school graduates, may be admitted if they make acceptable scores on the General Education Development (G.E.D.) Tests.

Students entering the School of Forest, Range and Wildlife Management will make more satisfactory progress if they have had high school algebra, chemistry, physics, typing, botany, zoology, and geometry. Students who have not had high school algebra or geometry should make up these deficiencies by taking their equivalent within the college as soon as possible.

COURSES OF STUDY

The curricula of this school prepare men for positions with federal or state agencies and for private work in (1) forest management, (2) range management, and (3) wildlife management. Forest management students may choose between two options: one designed to train for general forestry work, as with the public land managing agencies, and one more strictly for timber management. Range management students may choose, in the junior year, to specialize in general range management, forest range management, or soil conservation and watershed management. Wildlife management students may select a curriculum to train for management of big game; a curriculum in general wildlife management with emphasis on small game and fur-bearers; or, a curriculum in fishery management.

SUMMER CAMP

The School has purchased and leased approximately 3,000 acres of forest and range land 22 miles from the campus within the Cache National Forest, where training facilities have been established. Field instruction is required for graduation in addition to the regular 12 quarters of classroom work. Also, at least one summer season of practical experience in his field of specialization is expected of all students.

Attendance at summer camp is required between the sophomore and junior years and is prerequisite to the course work of the junior year. The camp
opens soon after the close of the spring quarter and continues for 8 weeks. Nine credits are allowed for the complete program. In addition to the regular summer school fees, a $6.00 fee is charged for each of the four courses. Board is provided on a cost basis, lodging is without cost. Students attending camp must be inoculated against Rocky Mountain spotted fever.

Students in other colleges or universities who wish to transfer to this school should consider carefully the following: Successful completion of all courses offered in the summer camp is (a) required for graduation in all three departments in the school, and (b) prerequisite to the professional courses in the junior and senior years. In planning a course of study for the junior and senior years, transfer students should note in the description of courses those for which the summer training is prerequisite. It should be recognized that some transfer students coming to this school with two or more years of college work may require more than two years to graduate. Transfer students should also note that to be eligible to attend summer camp they should have completed approximately two years college work, essentially duplicating the courses required of freshmen and sophomores in this school. It is especially important that they have had courses in systematic botany and engineering surveying.

FIELD TRIPS

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; this trip is required of all students. The trip for students majoring in wildlife usually is scheduled over the first week of May, and for range management juniors over the second or third week of May. The trip for forest management juniors is taken during a period of ten days or two weeks just prior to the end of the spring quarter. A fee of about $35.00 is charged each student to defray the general expenses of the trip.

LOAN FUNDS

Two sources of funds are available on a loan basis to worthy, deserving upper-division students in the School of Forest, Range, and Wildlife Management. These are the W. B. Rice Memorial Loan Fund, and the Bureau of Land Management Fund. Loans are made for short periods. The funds are administered by a faculty committee and application should be made to the Dean's office.

GENERAL REQUIREMENTS FOR GRADUATION

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management:

A. Two hundred and one credits (quarter hours) exclusive of basic Military Science and/or Physical Education.

B. Successful completion of summer camp, before the junior year, for which 9 credits are earned.

C. All courses prescribed under the study program of the chosen field.

D. All of the following general requirements:

1. English and Speech, 16 credits, of which at least 3 must be Speech.
2. Social Science, 8 credits, of which 5 are General Economics.
3. Military Science or Physical Education—6 quarters.

E. All students must demonstrate reasonable proficiency in written and spoken English; students showing marked deficiency are required to pass successfully certain supplementary or corrective courses in addition to the requirements stated above.

BASIC COURSES

Required of all students in the School of Forest, Range, and Wildlife Management.
Chemistry 10, 11, 12

2Mathematics 34, 35, 44

Forestry 1

3Animal Husbandry 1

4Animal Husbandry 2

Engineering Draw. 60

1Forestry 4, 5

SUMMER CAMP

Required courses at summer camp:

Forestry 96, Forest Surveying

Forestry 97, Forest Practice

Range Management 98, Range Practice

Wildlife Management 99, Wildlife Practice

It should be noted that junior standing (the equivalent of 90 quarter hours or 60 semester hours of college work) is prerequisite for all technical upper division courses and for the summer camp courses.

Forest Management

J. Whitney Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; R. R. Moore, Associate Professor and Director of Summer Camp; Stewart Ross Tocher, Assistant Professor and Director of Student Personnel; Extension Forester; James L. Mielke, Collaborator in Forest Pathology and Professor of Forestry.

Upon completion of either of the curricula prescribed below, students are granted the degree of Bachelor of Science in Forest Management. The courses are designed to give the student comprehensive training in all branches of forest management, including growing, protecting, harvesting and utilizing of timber crops. Two options are offered by this Department. It is desirable that the student know by the end of his sophomore year which he will follow. The option in general forestry provides training in timber management, and in addition training is provided in range management, wildlife management, recreation, and watershed management. This type of curriculum is particularly well adapted to the needs of personnel of the land managing agencies such as the Forest Service, Bureau of Land Management, Park Service, Soil Conservation Service, and comparable state agencies. The second option, timber management, provides major emphasis on the growing, harvesting, and utilizing of timber crops and is more appropriate training for employment in private forestry or much more specialized timber work with the public agencies.

It is highly desirable that every student engage in field work related to forestry in the summer following the freshman and junior years. Students are urged to obtain employment with such agencies as the U. S. Forest Service, Park Service, or comparable state agencies, or in private forest industries. There is maintained a working agreement with the Forest Service which pro-

1—Not required of men who have served with the U. S. Armed forces.
2—Students presenting 14 units of high school algebra or otherwise qualified to take Math. 36 are not required to take Math. 34.
3—Required only of students taking the general forestry option.
4—Required of range majors and students taking the general forestry option.
5—Required of forest and range management majors only.
6—Required in the sophomore year of forestry majors only.
7—Required of wildlife majors only.
8—Required of range majors, excepting soil conservation students. Wildlife management majors may substitute Physiology 4.
9—Cannot be taken for credit by students not in the school of Forest Range and Wildlife Management.
vides supervised and planned training jobs in the summer, at regular wages. The school maintains an employment service to aid students in obtaining such summer work.

Electives: Electives necessary to complete the program of the first two years should be chosen with the object of improving the student's cultural as well as professional background. In the junior and senior years, electives should be chosen with the object of broadening a specific field of study. Courses selected must meet the approval of the student's advisor.

The degrees of Master of Science in Forest Management or Master of Forestry are given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. The Master of Science degree requires that the candidate obtain a Bachelor's degree in Forest Management and in addition one or two years resident study depending upon his ability and his thesis problem. The Master of Forestry degree is designed for those who have a Bachelor's degree in some other field and who wish to earn a degree in Forestry. It normally requires from two to three years, depending upon how closely the candidate's original field was related to Forestry. Applicants should submit an official transcript of their college courses.

Two research assistantships are available to graduate students in Forest Management.

**FOREST MANAGEMENT**

**Freshman and Sophomore Years—See Basic Courses**

**A. General Forestry**

**Junior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Dept.</th>
<th>Number</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>Forest Measurements I, II</td>
<td>For. Mgmt.</td>
<td>F W S</td>
<td>F W S</td>
</tr>
<tr>
<td>Dendrology I, II</td>
<td>For. Mgmt.</td>
<td>112</td>
<td>113</td>
</tr>
<tr>
<td>Silviculture I, II</td>
<td>For. Mgmt.</td>
<td>114</td>
<td>115</td>
</tr>
<tr>
<td>Forest Protection I,*II</td>
<td>For. Mgmt.</td>
<td>118</td>
<td>119</td>
</tr>
<tr>
<td>Public Land Administration</td>
<td>For. Mgmt.</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>Junior Field Problems</td>
<td>For. Mgmt.</td>
<td></td>
<td>146</td>
</tr>
<tr>
<td>Plant Ecology</td>
<td>Range Mgmt.</td>
<td>126</td>
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<tr>
<td>Range Management</td>
<td>Range Mgmt.</td>
<td>162</td>
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<tr>
<td>General Wildlife Management .Wildlife Mgmt.</td>
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<td>150</td>
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</tr>
<tr>
<td>Technical and professional Speaking</td>
<td>Speech</td>
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**Senior Year**

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<tr>
<td>Forest Valuation</td>
<td>For. Mgmt.</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>Forest Economics</td>
<td>For. Mgmt.</td>
<td>123</td>
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<tr>
<td>Wood Technology</td>
<td>For. Mgmt.</td>
<td>126</td>
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<tr>
<td>Forest History and Policy</td>
<td>For. Mgmt.</td>
<td>133</td>
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<tr>
<td>Improvements and Recreation</td>
<td>For. Mgmt.</td>
<td>137</td>
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<tr>
<td>Silviculture III</td>
<td>For. Mgmt.</td>
<td>120</td>
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<tr>
<td>*Range Plant Communities</td>
<td>Range Mgmt.</td>
<td>131</td>
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<tr>
<td>*Watershed Management</td>
<td>Range Mgmt.</td>
<td>180</td>
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</tr>
<tr>
<td>Junior English</td>
<td>English</td>
<td>112</td>
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<tr>
<td>Aerial Photo Interpretation</td>
<td>For. Mgmt.</td>
<td>134</td>
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</tr>
<tr>
<td>Forest Seminar</td>
<td>For. Mgmt.</td>
<td>147</td>
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</tr>
</tbody>
</table>

*English 111 may be substituted for English 112.*
### B. Timber Management

Students who choose the timber management option will substitute the following courses for those marked (*) on page 206.

<table>
<thead>
<tr>
<th>Course</th>
<th>Dept.</th>
<th>Number</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>Seeding and Planting</td>
<td>For. Mgmt.</td>
<td>116</td>
<td>2</td>
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<tr>
<td>Logging</td>
<td>For. Mgmt.</td>
<td>125</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Properties</td>
<td>For. Mgmt.</td>
<td>129</td>
<td>2</td>
</tr>
<tr>
<td>Milling and Products</td>
<td>For. Mgmt.</td>
<td>130</td>
<td>4</td>
</tr>
<tr>
<td>Forest Entomology</td>
<td>Zoology</td>
<td>105</td>
<td>3</td>
</tr>
<tr>
<td>Forest Pathology</td>
<td>Botany</td>
<td>140</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Description of Courses

1. **General Forestry.** Survey of professions of forest management, range management, soil conservation, recreation and wildlife management; character of the work; and relation of conservation and multiple uses of wild land to welfare of state and nation. Open to all students. (3F, 3S) Turner

*2, *3. **Natural Resources Management.** Required of all first and second year students in School of Forest, Range, and Wildlife Management. (1W, 1S) Staff

*4, *5. **Natural Resources Management.** Required of all first and second year students in the School of Forest, Range and Wildlife Management. (1W, 1S) Staff

10. **Forest and Range Conservation.** Introduction to conservation problems designed to acquaint students with the nature and extent of the organic resources of the United States and methods of conserving them. Open to all students except those majoring in the School of Forest, Range, and Wildlife Management. (2W) Tocher

11. **Winter Woodcraft.** Lectures, field trips designed to train student in the proper way of living in wilderness. He must furnish his own field equipment and have suitable outdoor clothing. Lecture, field trips. (3W) Kelker

26. **Wood Technology and Mechanical Properties of Wood.** For vocational education majors or industrial arts majors. Covers structure, identification, mechanical properties of commercial woods of United States. (3W) Tocher

96. **Forest Surveying.** Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Practice in various forest and range land developments. Type mapping. Lab. fee $5.00. Summer Camp (3) Staff

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 $5.00. Summer Camp (2) Staff

103. **Silviculture and Dendrology.** Basic silvics; silvicultural systems; western conifers and western regional silviculture; and elements of eastern hardwoods and types. Not open to students in Forest Management. Prerequisite, Range 126, Summer Camp (4F) Daniel

104. **Forest Management and Economics.** Organization of a forest for production; surveys, normal and actual growing stock, determination of allowable harvest, management plans. Economics influencing management. Not open to students in Forest Management. Prerequisite: Summer Camp and Forestry 103. (3S) Moore


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*Cannot be taken for credit by students outside School of Forest, Range and Wildlife Management.*
107. Forest Measurements II. Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all aged, and residual cut over stands. Prerequisite: For. 106. (3S) Moore

112. Dendrology I. Hardwoods. Identification, distribution, and silvics of the more important forest trees in the United States. Prerequisite: Summer Camp. (3F) Daniel

113. Dendrology II. Conifers. Identification, distribution and silvics of the more important forest trees in the United States. Prerequisite: Summer Camp. (2W) Daniel

114. Silviculture I. Characteristics of the tree species which influence silvicultural practice in the United States. Prerequisite: Summer Camp, Range 126, For. 112, and 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: For 114. (3S) Daniel

116. Seeding and Planting. Seed collection, extraction, and cleaning methods; germination testing; storage of forest tree seeds. Practical experience in field planting and nursery work. Prerequisite: For. 115. (2S) Daniel

118. Forest Protection I. Prevention, presuppression and suppression of forest and range fires, including economic and physical effects. Fire behavior. Field trips. Prerequisite: Summer Camp. (3F) Floyd

119. Forest Protection II. Problems of administration and economics in protecting forests from biological enemies. (3W) Floyd

120. Silviculture III. Regional silviculture of United States. (3W) Daniel

121. Forest Management. Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. Prerequisites: Summer Camp, For. 106, 107, 115. (4F) Moore

122. Forest Valuation. Determination of monetary values in forest growing stock and land. Analysis of alternative management methods by use of standard valuation techniques. Prerequisites: For. 121. (4W) Moore

123. Forest Economics. Economic problems involved in the utilization of forest land and timber, and in the distribution of forest products. Prerequisite: For. 122. (3S) Moore

125. Logging. Principles and methods of harvesting wood products. Emphasis on cost, values and the application of forestry to the harvesting process. (3F) Moore

126. Wood Technology. Structure and identification of the economic woods of United States. (3F) Tocher

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

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


133. Forest History and Policy. Development of federal, state, and private forest policy. (2W) Turner

134. Aerial Photo Interpretation. Elements of photogrammetry. Use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of planimetric maps from vertical photographs. (3F) Tocher
137. Improvements and Recreation. Recreational use of forests and the classifications and planning of areas suitable for this purpose. Field trips. Prerequisite: Summer Camp (3S) Floyd

138. Recreational Planning. Mapping and designing plans for the various forms of forest recreational use. (3S) Floyd

145. Forest Problems. Individual study and research upon a selected forestry problem approved by the instructor. (1-3 F, W, S) Staff

146. Junior Field Problems. Study of forest operations. (3S) Junior year. Fee, $35.00. Staff

147. Forest Seminar. Systematic review of Forestry. (2S) Floyd

201, 202, 203. Advanced Forestry Seminar. Review and discussion of advanced current literature. For students in the graduate school. (1F, 1W, 1S) Turner

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) Turner

205. Silviculture. Intensive study of a particular region by individuals. Group work consists of advanced treatment of silvics and silviculture with emphasis on physiological aspects of both subjects. (3W) Daniel

206. Forest Management and Valuation. Application of forest management principles; forest organization and development; forest regulation, valuation, and control of operations. (2F) Moore

207. Forest Protection. Advanced study in specialized fields of forest protection. (2F) Floyd

208. Forest Measurements. Application of statistical measurements to forest problems. (3F) Moore

209. Forest Problems. Individual advanced study upon a selected forestry problem. (2-10 credits) Staff

211. Thesis. Original research on a problem in forest management to be concluded by preparation of a thesis. (10-15 credits) Staff

Range Management

L. A. Stoddart, Professor and Head of Department: C. Wayne Cook, Professor; Arthur D. Smith and ________________, Associate Professors; DuWayne L. Goodwin, Phil R. Ogden, and Max E. Robinson, Assistant Professors.

A 4-year program leading to the degree of Bachelor of Science in range management is available in the School of Forest, Range, and Wildlife Management. Opportunity is given under this program to specialize in general range management, forest range management or in range soil conservation and watershed management.

The range management option acquaints the student with methods of operating a ranch in the western range area and of managing range lands for private operators or for the federal or state governments. The forest range program enables the student to qualify for Civil Service Examinations required for employment by the U. S. Forest Service. Graduates under the soil conservation and watershed management program are especially qualified for work with the Soil Conservation Service in the western states.

Graduates from these programs are qualified for positions such as Forest Ranger, Soil Conservationist, and Range Manager under the United States Civil Service with such federal agencies as the Forest Service, Soil Conservation Service, Indian Service, and Bureau of Land Management. At present an acute 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 unusually good.

The graduates from these programs are qualified for many private jobs such as operating a livestock ranch, technical foreman for livestock companies, adviser to land management companies, and range land appraiser.

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, ani-
mal husbandry, botany, wildlife, economics, or agronomy. 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 also is offered. Students having the Bachelor's or Master's degree should contact the department head for information concerning their eligibility for study toward this degree.

There are available to advanced senior students and to graduate students a number of assistantships which will defray most of the costs of attending school. Such assistantships involve part-time work for the department as research or teaching assistants and generally pay one hundred dollars per month or more. Several of these assistantships are available each year and interested students at Utah State Agricultural College or other accredited colleges should apply to the department head for further details.

COURSE OF STUDY

All Freshmen and Sophomores

Students majoring in range management take the same course as all other students of the School of Forest, Range, and Wildlife Management during the freshman and sophomore years (see pages 203 and 204). This enables students to transfer without penalty from one department to another within the School at any time previous to their junior year.

General Range Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Freshman</th>
<th>Winter</th>
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<tbody>
<tr>
<td>*Botany 108</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Range 126</td>
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<td>Range 162</td>
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<td>Wildlife 160</td>
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<tr>
<td>Range 180</td>
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<tr>
<td>For. Mgmt. 132</td>
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<tr>
<td>*A.H. 110</td>
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<td>*A.H. 125</td>
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<td>Botany 120</td>
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<tr>
<td>Range 196 or 197</td>
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<td>English 112</td>
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<th>Course</th>
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<td>Range 164</td>
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<tr>
<td>*Range 181</td>
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<td>Range 192, 193, 194</td>
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<td>Range 180</td>
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<td>*An. Hus. 150</td>
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<td>Range 183</td>
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Suggested Electives

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<td>W. L. 155</td>
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**Forest Range Management**

Students planning a career with the U.S. Forest Service should take all courses in the general range management program plus the following courses:

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<tr>
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<th>Course Title</th>
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<tr>
<td>F. W. S</td>
<td>Forest Management 103...Silviculture and Dendrology</td>
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<td></td>
<td>&quot; 104...Forest Management and Economics</td>
<td>3</td>
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<td>&quot; 106...Forest Measurements</td>
<td>4</td>
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<td>&quot; 118...Forest Protection</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>&quot; 130...Milling and Products</td>
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</table>

**Soil Conservation and Watershed Management**

Students specializing in Soil Conservation and Watershed Management should take all courses in the general range management program except A.H. 10 and all courses marked (*). In addition, they should take the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>F. W. S</td>
<td>Agronomy 103...Forage Crops</td>
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<td></td>
<td>Agronomy 114...Soil Conservation and Survey</td>
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<td>Agronomy 155...Soil and Plant Relations</td>
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<td>Ag. Eng. 108...Eng. Aspects of Soil and Water Cons.</td>
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<td>Geology 115...Advanced Physical Geology</td>
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<td></td>
<td>C. Eng. 171...Hydrology</td>
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<tr>
<td></td>
<td>Botany 121...Water Relations of Native Plants</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Range 131...Range Plant Communities</td>
<td>2</td>
</tr>
</tbody>
</table>

**MINOR—RANGE MANAGEMENT**

The following courses in Range Management are suggested for students who wish to minor in this field. (Requirements subject to approval of the department head.): Range 126, Plant Ecology, 5 credits; Range 160 or 162, Principles of Managing Range Lands, 5 credits; Range 130, 131, 132; Range Plant Communities, 10 credits; Range 181, Range Economics, 3 credits; Range 192, 193, 194, Range Seminar, 6 credits.

**Description of Courses**

98. Range Practice. Field practice in problems of range land analysis and correlation of land uses. Lab. fee $5.00. Summer Camp (2) Goodwin

126. Plant Ecology. Analysis of habitat factors that influence plant growth and distribution. Attention to plant succession and competition and to plant indicators. Prerequisites: Bot. 30; Agron. 56 or 58. Laboratory fee $1.00. (5F, S) Stoddart

130. Range Plant Communities—Grasslands. Composition, distribution, successional patterns, and management of grassland ranges. Prerequisite: Bot. 30. Two lectures, one lab. (3F) Goodwin

131. Range Plant Communities—Forests. Composition, distribution, successional patterns, and management of forested ranges. Prerequisite: Bot. 30. Two lectures, two labs. Lectures may be taken without labs. (2-4W) Goodwin

132. Range Plant Communities—Deserts. Composition, distribution, successional patterns, and management of desert ranges. Prerequisite: Bot. 30. Two lectures, one lab. (3S) Goodwin

160. Principles of Managing Range Lands. A general course designed to give students not majoring in the field a knowledge of how to evaluate, increase, and perpetuate range. Field trips and laboratory work on range plants. Credit not allowed students having credit in R.M. 162. Prerequisite: Bot. 25. Four lectures, one lab. Laboratory fee $2.00. (5S) Cook

162. Range Management. Problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisite: Bot. 30 and Range 88. (5F) Cook

163. Range Improvement. Methods and problems involved in seeding range lands, improving stock watering facilities, and fencing ranges, terracing, water spreading and use of dams on range lands. Prerequisites: Range 160 or 162. Two lectures. (2W) Stoddart
164. Technical Problems in Range Management. Specialized problems in range management and range administration encountered by the technician. Prerequisites: Range 160 or 162. (3W) Stoddart

180. Watershed Management. Floods, soil erosion and runoff on range and forest lands, effects of vegetation in equalizing runoff and preventing erosion, and methods of rehabilitating damaged watersheds. Prerequisite: Range 126. Three lectures, one lab. Laboratory fee $2.00. (4F) Goodwin

181. Range Economics. Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 160 or 162. (3W) Cook

192, 193, 194. Range Seminar. A systematic review of range management and related subjects. Prerequisite: Range 160 or 162. (2F, 2W, 2S) Staff

195. Range Problems. Individual study and research upon a selected range problem. (1-3 F, W or S) Staff

196, 197. Range Field Problems. Field study of range management operation and research. Courses 196 and 197 given alternate years. (3W) Fee $30.00. (4F) Goodwin

200. Range Thesis. Original research and study on a problem in range management. Open only to graduate students. (1-15F, W or S) Staff

204. Land Use Seminar. Current problems and practices in wildland management and research with special emphasis on the western range. Required of all range management graduate students each fall quarter. (1F) Stoddart

205. Seminar in Range Nutrition. Problems in management and research in the field of plant and animal nutrition on the western range. Offered 1958 and alternate years. (2W) Goodwin

206. Research Methods. A study of research methods in range management and related subjects. Offered 1957 and alternate years. (2W) Cook

210. Environmental Factors. Environmental factors and interaction between organisms and environment as found on native range land. Offered 1957 and alternate years. Prerequisite: Range 126. (3W) Goodwin

211. Synecology. Development, structure analysis, and classification of native range vegetation. Offered 1958 and alternate years. Prerequisite: Range 126. (3W) Goodwin


281. Advanced Range Economics. Advanced study of economics of various systems of range management, range seeding, land operation, and livestock management. Prerequisite: Range 181. (2S) Smith

Wildlife Management

W. F. Sigler, Professor and Head of Department; G. H. Kelker, Professor; A. W. Stokes, Associate Professor. J. B. Low, Professor and Biologist; O. B. Cope, Professor and Fishery Biologist; Associate Professor, Fishery Biologist; and M. Laakso, Associate Professor and Fishery Biologist, U. S. Fish and Wildlife Service.

Upon completion of basic courses and the upper-division requirements outlined in the study program, students are granted the degree of Bachelor of Science, major in Wildlife Management. Prospective wildlife management majors should elect Zoology 3, 4 and 13 in the sophomore year. These classes are prerequisite to all wildlife classes.

Course work of the junior year provides comprehensive basic training in general wildlife management. The student shall choose one of three options to be completed in the senior year. The option in management of big game stresses the economic and ecological relationships of large mammals to forest and range, with emphasis on western conditions. The second option, featuring small game and furbears, considers representative areas of the United States for illustrative purposes in the management of each game bird or mammal.
The fishery option considers the production of both coldwater and warm-water fish in relation to land use which often seriously affects the water habitat. Training is, therefore, given in survey work of the water and the land from which it drains. Also, the student participates in creel censuses, measures the growth and productivity of fish in inland waters, and helps in various forms of habitat improvement.

Any one of the programs trains students for both general administrative and investigative work with state and federal agencies.

Graduate standing is required in order to take courses numbered over 200.

Upon completion of a prescribed course and fulfillment of the requirements listed by the Graduate School, a Master of Science or Doctor of Philosophy degree in Wildlife Management or Fishery Management is granted. A period of one to three or more years, depending upon the thesis problem and the amount of time that the student can devote to his studies, is necessary to complete all requirements for these degrees.

Through co-operation of the U. S. Fish and Wildlife Service, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the co-operatively sponsored Wildlife Research Units was established at Utah State Agricultural College in 1935.

Wildlife Research Unit funds are available for eight graduate research assistantships for students working toward a Master's degree or the Ph.D. degree in Fish and Game Management. The Wildlife Management department also has one teaching assistantship. Candidates for assistantships are chosen from applicants who have a Bachelor's degree in Wildlife Management or a related field from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before April 1.

A small number of part-time fishery positions are available during the school year with the Rocky Mountain Fishery Investigations of the U. S. Fish and Wildlife Service. Positions in summer work are filled through this and other agencies to give valuable practical experience in fishery techniques which may be gained by working in this capacity.

**COURSES OF STUDY**

For Freshman and Sophomore years, see basic courses for Forest, Range, and Wildlife Management

**Wildlife Management**

Courses required for graduation

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>F</th>
<th>W</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td>Wildlife 145</td>
<td>Principles of Wildlife Mgmt.</td>
<td>3</td>
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<tr>
<td>Wildlife 157, 158, 159</td>
<td>Seminars</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Wildlife 160</td>
<td>Animal Ecology</td>
<td>5</td>
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<tr>
<td>Wildlife 171</td>
<td>Field Problems</td>
<td></td>
<td>2</td>
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<tr>
<td>Wildlife 172</td>
<td>Problem Orientation</td>
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<td>3</td>
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<tr>
<td>Wildlife 175</td>
<td>Wildlife Law Enforcement</td>
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<tr>
<td>Range 126</td>
<td>Plant Ecology</td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>Agronomy 131</td>
<td>Applied Statistics</td>
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<tr>
<td>English 112</td>
<td>Junior English</td>
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<tr>
<td>Speech 106</td>
<td>Technical and Professional Speaking</td>
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</tbody>
</table>

The student must complete all course work in one of the three options to meet requirements for graduation. He may choose suitable electives from the other two groups to broaden his training.

\(^1\)English 111 may substituted for English 112.
Big Game Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>F</th>
<th>W</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td>Wildlife 146</td>
<td>Management of Upland Game</td>
<td></td>
<td>3</td>
<td></td>
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<tr>
<td>Wildlife 153</td>
<td>Management of Big Game</td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>For. Mgmt.</td>
<td>6 hours elective in 100 series</td>
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<tr>
<td>Range 162</td>
<td>Range Management</td>
<td></td>
<td>5</td>
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<tr>
<td>Range 180</td>
<td>Watershed Management</td>
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</tr>
<tr>
<td>Zoology 122</td>
<td>Mammalogy</td>
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<tr>
<td>Range 131</td>
<td>Range Plant Comm.—Forest</td>
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Small Game and Furbearer Management

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<tr>
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<th>S</th>
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<tbody>
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<td>Wildlife 146</td>
<td>Management of Upland Game</td>
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<td>3</td>
<td></td>
</tr>
<tr>
<td>Wildlife 147</td>
<td>Mgmt. of Waterfowl and Furbearers</td>
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<td>5</td>
<td></td>
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<tr>
<td>Wildlife 161</td>
<td>Limnology</td>
<td></td>
<td>4</td>
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<tr>
<td>Botany 112</td>
<td>Aquatic and Marsh Plants</td>
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<td>3</td>
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</tr>
<tr>
<td>Range 162</td>
<td>Range Management</td>
<td></td>
<td>5</td>
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<tr>
<td>Zoology 121</td>
<td>Ornithology</td>
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Fishery Management

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<tr>
<th>Course</th>
<th>Description</th>
<th>F</th>
<th>W</th>
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<tbody>
<tr>
<td>Wildlife 147</td>
<td>Mgmt. of Waterfowl and Furbearers</td>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>Wildlife 161</td>
<td>Limnology</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Wildlife 165</td>
<td>Fishery Management</td>
<td></td>
<td>3</td>
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</tr>
<tr>
<td>Wildlife 169</td>
<td>Techniques in Fishery Management</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Bot. 112</td>
<td>Aquatic and Marsh Plants</td>
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<td>3</td>
<td></td>
</tr>
<tr>
<td>Range 180</td>
<td>Watershed Management</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Zoology 155</td>
<td>Ichthyology</td>
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<td>4</td>
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</tbody>
</table>

Description of Courses

99. Wildlife Practice. Integrated studies of wildland populations in relation to other forms of life and to other land uses. Lab. fee $5.00. Summer Camp. (2)  
Staff

Stokes

146. Management of Upland Game. Taxonomy, life histories, distribution, environmental needs, enemies, and plans for management of game birds and small mammals. Prerequisites: Wildlife 99 and 145. (3S)  
Stokes

147. Management of Waterfowl and Furbearers. Taxonomy, life histories, habitat requirements, economic importance, and plans for management of waterfowl and furbearers, especially the muskrat and beaver. Prerequisites: Wildlife 99 and 145. (5S)  
Stokes

150. General Wildlife Management. Principles of animal ecology and wildlife management; life histories, ecology, economics, and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife majors. Field trips arranged. (5S)  
Kelker

153. Management of Big Game. Life histories, distribution, numerical variation, enemies, and management activities for native big game animals. Prerequisite: Wildlife 145. (5W)  
Kelker

155. Economic Wildlife. General importance of wildlife resources; natural history, economic values and control methods for rodents and predators; iden-
tification of skulls and skins; a brief evaluation of hawks and reptiles. Particularly adapted for students in forest management, range management, and agriculture. (3W)


157, 158, 159. Wildlife Seminar. Discussion of current developments in wildlife management. (1F, 1W, 1S) Staff

160. Animal Ecology. Distribution and behavior of animals as affected by various environmental factors. Special attention to interrelationships of biotic communities. (5F) Kelker

161. Limnology. Physical, chemical, and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisites: Bot. 30 and Zool. 13. (4F) Sigler

162. Fishery Ecology. Importance of the animal environment of fresh water fishes. Food organisms, predation, parasitism, and economic importance. Prerequisites: Zool. 3, 4, 13. Field trips, laboratory, lectures. (3F) Cope

164. Fish Populations. General population characteristics, methods of enumeration, and determination of mortalities. Paper required. Prerequisite: Permission of instructor. (2W) Laakso


166. Marine Fish and Fisheries. Ecology of marine environment, Chemical, physical and biological characteristics of the oceans. Each group of marine fish is evaluated from a taxonomic, ecological, and economic viewpoint, emphasizing the commercial marine fisheries of the world. Special consideration to oceanographic investigations and techniques designed to evaluate problems associated with commercial fisheries. Lecture and laboratory periods. Prerequisite: Zoology 155. (3F) Cope


170. Wildlife Problems. Individual study and research upon a selected wildlife problem approved by the instructor. (1-3F, W, or S) Staff

171. Field Problems. Study of wildlife management operations by various agencies in the Intermountain Region. (2S) Fee $35.00. Staff

172. Problem Orientation. A discussion of needs of and approach to wildlife investigations: analyzing the problem, presenting data, and drawing conclusions relative to research in wildlife management. (3W) Kelker

175. Wildlife Law Enforcement. Review of state and federal regulations of fish and game; discussions of apprehension of violators; collection of evidence and its use in the court. Offered in even numbered years. (3W) Sigler

210. Advanced Field Problems. Field training in techniques not covered in undergraduate courses. (1-3F, W, S) Staff

253. Advanced Studies in Big Game Management. Population dynamics, census methods, hunting regulations, and management plans. Prerequisite: Knowledge of Big Game biology. Field trips (3W) Kelker

257. The Research Approach. The application of elementary logic and the scientific method to wildlife investigations. (2F) Kelker

258. Graduate Seminar. Discussion of current investigations by class members and by representatives of state and federal agencies. (2W) Low

259. Graduate Seminar. Review of current literature pertaining to the completion and publication of technical papers. (2S) Sigler


261. Limnology II. Advanced study of factors affecting productivity of fresh water. Pre-requisite: Wildlife 161 or equivalent. (2F) Sigler

270. Research and Thesis. A research problem chosen, the project outlined, and data collected, analyzed, and summarized, and thesis prepared by the student. (5-15F, W, S, SS) Staff
SCHOOL OF HOME AND FAMILY LIVING

UNA VERMILLION, Acting Dean

School of Home and Family Living .................................................. 212
Two-Year Terminal Course in Home Economics .................................. 213
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Clothing, Textiles, and Related Arts ............................................... 216
Foods and Nutrition ......................................................................... 217
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Home Economics Education .................................................................. 220
General Information

All home and family living courses are planned to provide well-rounded personal development, to help students become more effective members of the home and the community and to train for a professional career.

Home and family life is related to all areas in home economics. Thus courses are planned to prepare young women to carry the art and science of skilled home living into the various phases of today's complex society. During the first two years, emphasis is placed on general education and on basic training for home and family living. In the junior and senior year the student follows a program in one of the professional curricula, directed toward a career in some phase of home economics. Accordingly students may elect majors leading to a Bachelor's Degree in the following divisions: Child Development and Parent Education, Clothing, Textiles and Related Arts, Foods and Nutrition, Household Administration, and Home Economics Education.

The chief professional opportunities open to graduates in the School of Home and Family Living are in addition to homemaking, teaching, extension service, institutional management, research, and home economics in business.

GENERAL REQUIREMENTS

Lower Division Requirements—See "Academic Regulations" page 49.

Core Requirements—All curricula in the School of Home and Family Living are based on a required core of courses designed to give a broad education for family and community living. They emphasize practical aspects of home economics and are planned to give students desirable basic training in activities related to successful management of a home. These requirements make up a large proportion of the work of the freshman and sophomore years. Courses which meet core requirements of the School of Home and Family Living are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>H. Ad. 10</td>
<td>Introduction to Home Economics</td>
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<tr>
<td>CTRA 4</td>
<td>Clothing Selection</td>
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<tr>
<td>*CTRA 8</td>
<td>Clothing for the College Girl</td>
<td>3</td>
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<tr>
<td>FN 5</td>
<td>Nutrition</td>
<td>3</td>
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<tr>
<td>FN 24</td>
<td>Food Preparation</td>
<td>5</td>
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<tr>
<td>CD 67</td>
<td>Child in the Family</td>
<td>3</td>
</tr>
<tr>
<td>CD 68</td>
<td>Pre-School Laboratory</td>
<td>2</td>
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<tr>
<td>H. Ad. 149</td>
<td>Home Management</td>
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</tbody>
</table>

TWO-YEAR TERMINAL COURSE IN HOME AND FAMILY LIFE

A two-year terminal course in home economics is offered for students who, for any reason, do not expect to complete any of the four-year majors in the homemaking group. The course is so planned, however, that students may without undue delay, complete later the work required for a four-year course.

While the course offers a broad foundation in homemaking, it also makes possible a concentration of effort on phases of home economics that prepare the student for employment in specific occupations.

Requirements for two-year terminal course are as follows:

1. Complete a major of 30 credits in one or more closely related departments of the School of Home and Family Living.
2. Complete a minor of 15 credits related to or basic to the major—not necessarily in the School of Home and Family Living.
3. Twenty-four credits in basic groups:
   (a) Language, 9 credits; (b) Exact Science, 5 credits; (c) Biological Science, Science, 5 credits; and (d) Social Science, 5 credits.
4. Electives—21 credits.
5. Physical Education—6 credits.

*Pre-testing—a pre-test in clothing construction will be given entering students majoring in H.F.L. to determine if CTRA 8 should be taken. CTRA 4 and 25 will take the place of CTRA 8 in meeting core requirements if CTRA 8 is waived.
Child Development and Parent Education

Don C. Carter, Associate Professor and Head of Department; Ruby Eames, Dorothy Lewis, Assistant Professor; Ruby Eames, Instructor; Valera Holman, Head Teacher, Preschool Laboratory and Cooperative Nursery.

Child Development is a desirable area of study for students who are interested in children either professionally or in terms of their role as prospective parents, or both. The major in child development should prepare students for a more satisfying role as parents, and professionally for teaching in, or conducting, a private nursery school; teaching in kindergarten or elementary school (with a teaching certificate); extension service positions in child development and parent education; and teaching in a nursery school in a welfare program, health center, housing unit, or industrial plant.

The curriculum for majors in the Department of Child Development and Parent Education includes, in addition to the Home Economics core courses, the following: Child Development 80, 138, 174, 175, and 150; an additional 18 credits to be selected from the following courses: Child Development 115, 125; English 122; Speech 118; Psychology 105; Sociology 160; Zoology 111; Clothing, Textiles and Related Arts 185; Art 34. Recommended electives are: Physical Education 81; Psychology 123, 145; Household Admin. 150; Education 107, 108, 109, 110, 161.

Students who desire to minor in child development should include in their program Child Development 67, 68, 80, 174, and 175, in addition to 1 to 3 credits of electives in the department. Child Development 150 is recommended to fill this elective requirement. The minor is recommended for students in elementary education, and others who desire to gain a greater understanding of the young child. The minor is recommended particularly for prospective kindergarten teachers who do not elect to major in the department, and for men in such fields as elementary education who, perhaps more than women in our culture, may benefit from an opportunity to study the young child in such a setting as the Preschool Laboratory.

Students who expect to teach in kindergarten or elementary grades must meet the state requirements for certification. It is recommended that they adopt a major in elementary education as well as a major in child development. These majors relieve the student of a requirement for a minor.

Courses

67. The Child in the Family. To help students develop a philosophy of family living as desirable background for the child; understanding of reproduction, prenatal care; fundamentals of growth and development; and a beginning concept of guidance. (3F, W, S) Carter; Lewis

68. Preschool Laboratory. Directed observation in the College Preschool Laboratory. Recommended to parallel C.D. 67. (2F, W, S) Carter; Lewis

80. Guidance of the Young Child. Review of developmental principles with special emphasis on social-emotional growth; fostering growth through creative materials and play equipment; guidance philosophy, principles and techniques. Three lectures. Two hours lab. weekly, arranged at time of registration. Prerequisite: C.D. 67 (3F, W, S) Lewis; Eames


125. Parent Education. Application of principles of child development and family relationships to educational programs for parents. (3F) Carter

138. Survey in Child Development. History of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration. Three lectures and a two hour nursery school teaching laboratory weekly. (6S) Lewis

150. Seminar in Child Development. Discussion of current readings in child growth and development, with emphasis on development of insight and self-understanding. (2S) Carter
174. Nursery School Methods. Must parallel 175. Study and collection of materials used in nursery school teaching, such as stories, pictures. Special consideration to understanding the needs of individual children in the nursery school and evaluation of procedures used in guiding them. (3F, W, S) Eames; Lewis

175. Practice Teaching in the Nursery School. An opportunity to apply principles of child guidance in the nursery school. Prerequisite: C.D. 80 (6F, W, S) Eames; Lewis

176. Advanced Practice Teaching in the nursery school. Continuation of C.D. 175. Additional opportunity to work with young children. One conference weekly with instructor. Prerequisite: C.D. 175. (4-6F, W, S) Staff

140. Special Problems in Child Development. For qualified students upon consultation with instructor. Spring quarter. Time and Credit arranged. Staff

210. Research for Master's thesis. Any Quarter. Staff

**Clothing, Textiles, and Related Arts**

Florence Gilmore, Associate Professor, and Head of Department; Theta Johnson, Associate Professor, Extension Clothing Specialist; Dorothy Hatfield, Assistant Professor; Haruko Terasawa, Instructor.

A Bachelor of Science degree and a Master of Science degree are offered in Clothing, Textiles, and Related Arts.

Students who elect Clothing, Textiles and Related Arts as their majors are required to complete the following courses in addition to the Home Economics core courses: Clothing 24, 25, 105, 115, 125, 140, 165, 170, 175, 185, 191; Household Administration 150; 18 credit hours in the art department to include Art 1, 2, 3, 32 with the additional hours in 111, craft or studio classes.

Students who elect to minor in Clothing, Textiles and Related Arts are required to complete the following courses in addition to Home Economics core courses: C.T.&R.A. 24, 115, plus 7 hours of electives.

The Clothing, Textiles, and Related Arts Department in co-operation with other departments offers majors in the following fields: Costume Design, Textile Design and Research, Teaching of Clothing and Textiles, Home Decoration, and Fashion Merchandising.

In addition to major requirements and Home Economics core, it is recommended that the following courses be taken when planning for a definite profession.

**Fashion Merchandising.** Those preparing for Fashion Merchandising may wish to complete a major in Clothing, Textiles and Related Arts and add the following courses: Bus. Ad. 62, 63, 108, 149, 151, 153, 156; Psy. 155; Art 1, 2, 3, 32, 110, and other art courses to complete a minor; Econ. 51.

**Costume Design:** Those preparing for costume design may wish to complete a major in Clothing, Textiles, and Related Art and add the following courses: Art 1, 2, 3, 110, 111, 132, 135.

**Education Majors in Clothing and Textiles** who desire to teach in secondary schools should complete a double major of Vocational Home Economics and Clothing and Textiles.

**Textile Research.** Those preparing for Textile Research should complete a double major in Clothing, Textiles and Related Arts and Exact Science.

**Textile Design.** Those preparing to design textiles may wish to complete a double major of Clothing, Textiles and Related Arts and Art. The following courses in Art are required: Art 1, 2, 3, 32, 111, 127 and additional work to complete a major.

*Home Decoration. Those preparing for Home Decoration may wish to complete a major in Clothing, Textiles, and Related Art and add the following courses: Household Adm. 65, 100, 149; Landscape Arch. 3; Art 1, 2, 3, 26, 32, or 132, 122, 123.
Field Trip. A two-day field trip to be taken in the Spring quarter is required of juniors and elective for seniors majoring in Clothing, Textiles and Related Arts. The purpose is to study process related to manufacturing and retailing of fabric and apparel; also to become acquainted with opportunities and requirements for employment in designing, manufacturing, merchandising, advertising, and home decoration.

Home Project. A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing, Textiles and Related Arts. Clothing 25 is a prerequisite. The project is turned into the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

CLOTHING, TEXTILES AND RELATED ARTS

4. Clothing Selection. Wardrobe planning and buying for the college girl considering the principles of design in relation to the student's appearance, personality and needs; care and repair of clothing. (2F, W, S) Open to majors and non-majors. Terasawa

6. Dress Construction. A course for non-home economics students who wish to develop skill in construction techniques. Construction of a speed project, and a tailored dress, and a skirt. (3F, W, S) Terasawa


15. Clothing Selection for Men. Men's apparel as related to the wearer. Consideration is given fundamentals of fabric and garment selection. Organized to meet the needs of men from all schools of the college. (2W) Gilmore


25. Advanced Clothing Construction. Consideration is given to alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, construction, and finishes. Prerequisite: CTRA 4, 8, 24, and prerequisite Art 1 and prerequisite or parallel Art 2. (3W, S) Gilmore

27. Household Textiles. Consideration is given fabrics for household and personal use, stressing selection, utilization, care, and cost. Prerequisite: 24. (3S) Alternate years only. Taught in 1957-58. Gilmore

33. Home Furnishings. Practical experience in selecting, refinishing, and arranging home furnishings in relation to a specific problem. Laboratory includes elementary furniture upholstery, wood finishing, and the making of draperies. (3F, W, S) Hatfield

41. Weaving. Fundamental principles of weaving. Emphasis on weaving for practical use—place mats and napkins; luncheon sets; cotton skirt, blouse or apron material; draperies, etc. (3F, W) Staff

105. History of Costume. Shows social, economic political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. (3F) Hatfield

115. Art in Everyday Living. Study of art elements and principles of design as applied to dress, the home and daily living. Prerequisites: CTRA and Home Economics Education Majors; Art 1 and 2; For others interested Art to satisfy the Instructor. (3F, W) Hatfield
125. Draping. Creative experience in dress designing by draping on the dress form. Emphasis placed on fitting and understanding the effect of pattern, grain, and texture on design and dress. Problems consist of making a French lining and draping two garments. Prerequisites: CTRA 25, 115. (5F) Alternate years only. Taught in 1956-57.

133. Advanced Home Furnishings. A laboratory course giving experience in furniture renovation. (3 Summer)

141. Advanced Weaving Problems. Advanced problems in weaving. Pattern draft reading and proving drafts on paper to understand different weaves. Weaving for practical use of woolen or tweed material, stoles, drapery, and upholstery material, etc. Prerequisite: CTRA 41. (3S) Staff

165. Tailoring. Application of techniques used in tailoring suits and coats. Prerequisite: CTRA 25. Recommended CTRA 125. (3F, W)

169. Newer Developments in Textiles. Designed for teachers and advanced students of Clothing and Textiles. Class includes a study of fibers, finishes, and materials being placed on the market and economic conditions affecting their production as well as factors influencing choice and care of present day materials. Prerequisite: CTRA 24 or equivalent. (3 Summer) Gilmore

170. Flat Pattern Designing. Principles of designing and construction of patterns by flat pattern method; fitting and pattern alteration; development and use of a basic sloper. Prerequisites: CTRA 25, 115. (3S) Terasawa

175. 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. Prerequisite: CTRA 24; Recommended: Chem. 10, 11, 12. Outside work required. Alternate years only. Taught in 1956-57.

185. Children's Clothing. Clothing needs of children at different developmental levels from infancy to early elementary age in relation to total family clothing; selection and construction of children's garments; care and renovation of clothing. Prerequisite: CTRA 8; Recommended: CTRA 24. (3F, S)

190. Special Problems. Independent study under direction of professor of a problem in CTRA in which upper division or graduate student has special interest or need. Consult department head before enrolling. Any quarter. Time and credit arranged.

191. Seminar. Reports and discussions on current literature in Clothing, Textiles, and Related Arts. (2S) Staff


290. Special Problems. Open to Graduate students in Clothing, Textiles, and Related Arts.

291. Graduate Seminar. Open to Graduate students in Clothing, Textiles, and Related Arts.

Foods and Nutrition

Una Vermillion, Acting Dean; Ethelwyn Wilcox, Professor; Priscilla Rowland, Margaret B. Merkley, Elma Miller, Extension Nutritionist, Professors.

Students majoring in Foods and Nutrition are required, in addition to the Home Economics core, to complete the following courses: Foods and Nutrition 25, 46, 107, 140, 141, 144, 148, 180, Household Administration 150; Chemistry 10, 11, 12; Biochemistry 190.

Students majoring in Dietetics or Institutional Management must meet the requirements for the Foods and Nutrition major. In addition, the following courses are required: Bacteriology 10; Physiology 4; Psychology 53; Economics 51; Sociology 70; Business Administration 109; Psychology 102; Education 120; Foods and Nutrition 182.
5. Principles of Nutrition. The relation of food to the health of the family; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. Open to all students. (3F, W, S) Rowland


25. Meal Preparation for the Family. Planning, preparing and serving meals for the family. Consideration is given to nutritional adequacy of meals at different income levels. Prerequisite: Foods 24. (3F, W, S) Rowland

46. Food Technology. Manufacture and preservation of food products and influence of these processes on physical, chemical, and nutritive values of foods. Prerequisites: Bacteriology 10, Foods 24. (2F) 2 lectures; 1 two-hr. lab.

100. Quantity Food Preparation for School Lunch and Special Occasions. Meets needs of Home Economics Education students. Emphasis on planning balanced school lunches and on organization, preparation, and service of foods in large quantities for special events. (3S)

107. Experimental Cookery. Development of experimental methods; their application to investigation in cookery and food preservation; literature of the field. Prerequisites: Organic Chemistry, Foods 24 and 25. Offered in alternate years. (4S)

140. Advanced Nutrition. The fundamental principles of human nutrition and their application to the individual and family group. (3F) Offered in alternate years.

141. Advanced Nutrition. Nutritional requirements of the mother during pregnancy and lactation; nutrition of child through infancy to adolescence. (2W) Offered in alternate years.


144. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations, a dietary study, and a project in animal experimentation. Prerequisites: Biochemistry 190, or permission of instructor. (2F)

145. Diet Therapy. Application of dietetic principles to problems of disease with calculation of diets in disease. Prerequisite: Nutrition 141. (4W)

190. Special Problems. Open to qualified students majoring in Foods and Nutrition upon consultation with instructor. (F, W, S), time and credit arranged.

180. Quantity Food Preparation. Application of the principles of food cookery applied to large quantity preparation. Standardization of food quality, production costs and menu planning studied. College food service units used as laboratories. Open to juniors and seniors majoring in dietetics or institutional management. (5W) Offered in alternate years.

182. Institutional Organization and Management. Principles of Scientific management applied to food service unit. Emphasis of organization, personnel relationships, records and sanitation. One unit on specification writing and purchasing methods. (F)

184. Cost Control in Food Institutions. Varied aspects of money management as it affects food service in institutions. (2W)
201. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral and vitamin determinations. Prerequisite: Chemistry 190 or 191, or equivalent. (F, W, or S), time and credit arranged. Wilcox


203. Nutrition Laboratory. Microchemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chemistry 190 or 191, or equivalent (F, W, S), time and credit arranged. Wilcox

207. Advanced Experimental Foods. Development of experimental method and its application to cookery, preparation of student for independent investigation of foods. (F, W, S), time and credit arranged. Staff

210. Research for Master's Thesis. Credit arranged. Wilcox

243. Recent Developments in Nutrition. Study of problems in nutrition selected according to needs of students. Prerequisite: Nutrition 140. (2W, S) Wilcox

290. Special Problems. Open to graduate students in Foods and Nutrition. (F, W, S), time and credit arranged. Vermillion

291. Graduate Seminar. Open to graduate students in Foods and Nutrition. (F, W, S), time and credit arranged. Wilcox

**Household Administration**

Margaret Merkeley, Head and Instructor.

Una Vermillion, Professor; Edith Nyman, Instructor; Rhea H. Gardner, Associate Professor, Extension Home Management Specialist.

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying the effects of social and economic forces on the home and its management.

Students majoring in Household Administration are required, in addition to the Home Economics core, to complete the following courses: Household Administration 55, 65, 100, 150; C.T.&R.A. 33, and 115; F & N 25.

10. Introduction to Home Economics. A course designed to help freshmen students to become better adjusted to college life. Includes help with the library, studying, and how to understand the use of the college catalog. Special help is given on the selection of a major in Home Economics. (1F) Vermillion

55. Family Finance. Includes the study of personal and family finance with emphasis on finance plans and investments. (2F, or W) Nyman

65. Housing. Presents housing needs and practices affecting housing construction and home ownership, also includes evaluation of house plans. (3F, W, or S) Nyman

100. Household Equipment. Selection, method of operation, and maintenance of equipment used in the home, with emphasis on kitchen and laundry equipment. (2WS) Vermillion

149. Home Management. Principles of household management. Includes a philosophy of homemaking, use of human and material resources, and improvement of housing as is related to family living. (3F, W, or S) Nyman

150. Home Management House. Residence students are directed in practical management of home experiences. Required of all Home Economics majors. Elective for other students upon consultation with the advisor of Home Management House. Prerequisites: H. Ad. 149; F.&N. 24 and 25. Time arranged. (4F, W, or S) Nyman

160. Special Problems. Individual study of management problems in which upper division student wants special help. Consult department head for arrangements. (F, W, or S), time and credit arranged. Vermillion
Home Economics Education

Margaret Merkley, Head and Instructor; ........................................, Instructor.

A Bachelor of Science degree and a Master of Science degree may be earned in Home Economics Education.

The following professional program prepares graduates for teaching courses in homemaking. It certifies graduates to teach all phases of homemaking in Utah schools, including federally aided schools.

It is important that students register with the instructor for Education 121 and 122 two quarters before they plan to do their student teaching. This provides the time necessary to obtain co-operation of schools in setting up teaching assignments for those registering in these courses.

FRESHMAN AND SOPHOMORE YEARS

In addition to the Home Economics core courses, the following lower division courses are required to meet Utah certification requirements in Home Economics Education: Child Development 80; Sociology 60; Clothing, Textiles and Related Arts 24 and 25 and 35; Household Administration 55 and 65; Foods and Nutrition 25.

Other elective courses in Home Economics and related subjects should be selected carefully by the student.

To meet college group requirements, the student planning to major in Home Economics Education needs to keep in mind:

1. Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 53.
2. Elective recommendations: Students are advised to consider developing a subject interest into a teaching minor; e.g., Art, Secretarial Science; English, Music, Physical Education, and Social Science.
3. Home Project: A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing Textiles and Related Arts. Clothing 25 is a prerequisite. The project is turned in to the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

CURRICULUM IN HOME ECONOMICS EDUCATION

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
<tr>
<td>C.T.&amp;R.A. 165</td>
<td>3</td>
</tr>
<tr>
<td>F.&amp;N. 146</td>
<td>2</td>
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<tr>
<td>H. Ad. 149</td>
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<tr>
<td>English 110</td>
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<td>Edu. 114, 120</td>
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<tr>
<td>Public Health 155</td>
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<td>Psych. 102</td>
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Total ........................................ 48

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<td>Edu. 113 or Psych. 113</td>
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<tr>
<td>Electives</td>
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</table>

Total ........................................ 48

Courses to complete requirements for professional education may be elected. (Check with major professor to be sure requirements for certification are being met.)
The following upper division courses in Home and Family Living and related departments are recommended as electives: Foods and Nutrition 100; Clothing, Textiles and Related Arts 185; Sociology 160, 162, or 262.

EXTENSION SERVICE CURRICULA

Requirements for entering the Extension Service as County Home Demonstration Agents:

Completion of Home Economics Education curriculum as outlined, and in addition:

- Journalism 12 ............................................. 3
- Public Speaking 4 or 5 .................................. 5 or 3
- Sociology 141 ........................................... 3
- Extension Methods 151 ................................... 3

A 3-month training period in a county under supervision is advised of prospective Home Demonstration Agents. Plans for this training are made with Director of Extension Service.

Courses

Education 120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Understanding students, homes, families, and communities. Guiding and evaluating pupil development. Analysis of teaching situations based upon observation of school activities. Prerequisite or parallel: Psych. 102. (3F or S) Merkley

Education 121. Problems in Teaching Home Economics. Study of recent investigation in Home Economics and General Education and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) This course should be blocked with Education 122 and with one other 3-hour Education course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W or S) Merkley

Education 122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teacher leaves campus the middle five or six weeks of Fall, Winter, or Spring quarter and teaches a full homemaking program each day in an approved school. Prerequisites: Ed. 120, 121. (8F, W, or S) Staff

199. Special Problems in Home Economics Education. Developed around individual needs of students not otherwise provided for in curriculum. (1-2F, W, S) Merkley


CERTIFICATION REQUIREMENTS FOR TEACHERS OF VOCATIONAL HOMEMAKING IN SECONDARY SCHOOLS

Follow the Home Economics Education curriculum. For transfer students, credits are evaluated by staff members and equivalent course work is accepted. Requirements for certification follow:

**Group I**

Nine credits in courses which assist in understanding young people of school age.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>†Psychology 102</td>
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<tr>
<td>†Public Health 155</td>
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<tr>
<td>Psychology 112</td>
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<tr>
<td>Education 113</td>
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</tbody>
</table>

**Group II**

Six credits in understanding for school.

<table>
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<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>†Education 114</td>
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<tr>
<td>†Education 112</td>
<td>3</td>
</tr>
<tr>
<td>Education 111</td>
<td>5</td>
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</tbody>
</table>

**Group III**

Fifteen credits in Student Teaching, including methods.

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>†*Education 120</td>
<td>3</td>
</tr>
<tr>
<td>†*Education 121</td>
<td>4</td>
</tr>
<tr>
<td>†*Education 122</td>
<td>8</td>
</tr>
</tbody>
</table>

A total of thirty-three credits in professional education, including Public Health 155, must be presented to meet the requirements for the General Secondary Certificate and the Vocational Homemaking in Secondary Schools Certificate. Special courses recommended for Certification in Vocational Homemaking Education are listed above. These professional courses plus the prescribed subject matter courses in Home Economics are necessary for certification in Vocational Homemaking Education in Secondary Schools.

Types of service available to teachers:

1. Special guidance and help are given teachers who wish to return to school to meet requirements for renewing their certificates.

2. Opportunity to meet certification requirements is offered teachers or other persons.

3. Advanced study leading to Master of Science degree in Home Economics Education is offered.

*It is necessary to make arrangements for specific Education course with Major professor at time when plans are made for Ed. 121 and 122.

†Required courses.
SCHOOL OF HUMANITIES AND SCIENCES

CARLTON CULMSEE, DEAN

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General Information

Besides training students for studies in the technical divisions of the Institution, the School of Humanities and Sciences enables all students in the College to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never been so urgent as now. Such understanding is the surest path to permanent peace. Many courses in Humanities and Sciences qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of Humanities and Sciences also enable students to major in its departments and thus begin preparation for their careers.

The School of Humanities and Sciences includes the departments of Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, English and Journalism, Photography and Photographic Journalism, Geology, Landscape Architecture and Planning, Mathematics, Military Science and Tactics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology, and Physiology.

General Studies

TWO-YEAR PROGRAM IN GENERAL EDUCATION

Students may earn the title of "Associate in Arts" or "Associate in Sciences" and a two-year diploma by completion of a program in basic education. It is believed that the prescribed studies will be very helpful to any student, whether he completes only two years of college or whether he continues until he receives a B.S. degree. Although the total number of credit hours required in this program is larger than that required for the completion of the "group requirements" now current, the student may also specialize to some extent in these first two years of college.

The courses, which are drawn from the Schools of Humanities and Sciences, Business and Social Sciences, and Education, are as follows:

Physical Science

Physical Science 31, 32, 33. Central Principles .................. 3-3-4 Credits

Biological Science

Biology 1. Principles of Biology .................................. 5
Physiology 4 or lower division Bacteriology ...................... 5

Heritage of Civilization

History 4. Ancient World Civilizations ........................... 5
History 5. Modern World Civilizations ........................... 5

Citizenship

History 13 or 14. U. S. History ................................. 5
Pol. Sci. 10. American National Government .................... 5
General and Social Science ...................................... 5

Communication

English 17, 18, 19. Freshman English .......................... 9
Speech 1. Speech Fundamentals ................................. 5
Humanities

English 40. World Literature .............................................5
English 60. English Literature ..........................................5
English 53. American Literature .........................................5
(or)
One year of a foreign language ......................................14 or 15 credits
(or)
Art. 3. Art Understanding and Appreciation .......................3
Art. 26. History and Appreciation of Architecture ..............3
Art. 36. Development of Modern Art ................................3
(or)
Music 1. The Art of Listening .........................................3
(or)
Music 90. Music in General Culture ................................3

Men should also register for Basic Military or Air Science each quarter, and women for a Physical Education activity course each quarter.
Advisers would do well to help students choose classes in health, family living, diet and nutrition, economics and financial planning, and other courses of high functional value in today's living.

INTEGRATED COURSES

The following are broad integrated courses which may be used to satisfy group requirements. They are listed here to facilitate selection and advise-
ment.

Biology

Administered by the staffs of the Department of Bacteriology and Public Health, Botany and Plant Pathology, Zoology, Entomology, and Physiology

1. Principles of Biology. Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environments, kinds of living things, reproduction, development, inheritance, and evolution. Five lectures. (5F, W, S, or Su) Staff

Physical Science

Administered by the staffs of the Departments of Chemistry, Geology, and Physics

31, 32, 33. Physical Science. Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, and physics integrated for use in interpreting human experiences. Intended to meet the physical science group requirements upon completion of all three quarters. (3F, 3W, 4S) Staff

Humanities (Languages and Arts)

English 40, 41—World Literature.
English 53, 54—American Literature.
English 60, 61—English Literature. (see English dept. for write-up and staff)
In addition it is recommended that the student complete at least one of the following:
- English 48—Modern European Literature.
- English 58—Modern American Literature.
- English 68—Modern English Literature.
Also it is recommended that the student complete one of the following:
- Art 3; 26; 36.
- Music 1; 90.

Two years of a foreign language are also recommended as an option for satisfaction of the Language and Arts, or Humanities, group requirement.

### Social Sciences

**History 4. Ancient World Civilization.** An integrated course in the cultural heritage of the world from earliest times to the sixteenth century. The Near and Far eastern civilizations with emphasis on the European heritage: Greece, Rome, Christianity, the Middle Ages, Renaissance and Reformation. (5F or S) Ellsworth

**History 5. Modern World Civilization.** The cultural heritage of the world from the sixteenth century to the present. Emphasis on European civilization and its spread in the world—the Americas, the Near and Far East. (5W) Ellsworth

(Political Science 1—Government and the Individual, General Social Science and History 13, 14—United States History, are also recommended.)

Students are encouraged to broaden their liberal education with other courses in basic sciences and humanities, landscape architecture, political science, economics, and sociology.

### Philosophical Literature

Most of the courses listed below have been cross-referenced from other departments. The major part of their content is philosophical. They are assembled here for the convenience of students interested in the interpretations which philosophers 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.

The philosophical content in many other courses in History, Political Science, and Literature is rich. Such courses as Ancient World Civilizations and Modern World Civilizations (History 4 and 5) are invaluable to one wishing to understand the development of human thought.

It is recommended that students take advantage of the instruction in religious philosophy offered by the churches of Logan. Of such work, those courses classed as non-secular yield college credit.

45. Readings in Philosophical Literature. Selected readings in works by great philosophers from Plato to the present. (5W) English 45. Hayward

46. The Bible as English Literature. Provides an opportunity for first-hand acquaintance with the great book of books. (5S) English 46. Vickers

48. Modern European Literature.

58. Modern American Literature.

68. Modern English Literature. (See English dept. for write-up and staff)


117, 118, 119. American Political Thought. The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, modes of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Students may register for one, two or three quarters. (2F, 2W, 2S) Political Science 117, 118, 119. Staff
131. Organic Evolution. Critical study of the facts of evolution as obtained from consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: Zoology 1 or 2, or 3 and 4. 111 and 112 recommended. (3W) Gardner

134. Literary Criticism. Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4S) English 134.

145, 146. History of Political Thought. No. 145 covers political theories and ideas from the Greek period to Martin Luther. No. 146 continues the study of political theories from Luther to 18th Century. Students may take either or both quarters. (3F, 3W) Political Science 145, 146. Edwards

147, 148, 149. Comparative Literature. (See English dept. for write-up and staff.)

150. Recent Political Thought. Political ideas and writers from the close of the 18th Century to the present with emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3S) Political Science 150. Staff

175. History of American Democratic Thought. American democratic thought from the Revolutionary War to the present. (3W) History 175. Ricks

**PRE-MEDICAL TRAINING**

The School of Humanities and Sciences offers the courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

**Suggested Pre-Medical Schedule**

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<tr>
<td>F</td>
<td>W</td>
</tr>
<tr>
<td>Zoology 3, 4</td>
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<tr>
<td>Chem. 3, 4, 5</td>
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<td>Math. 34, 35, 44 or 46</td>
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<td>English 40 or 52</td>
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<td>Military Science</td>
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<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Recommended electives are Scientific Vocabulary (Eng. 5), Psychology, College Grammar, Technical Writing, History, Political Science, Sociology, Economics, Philosophical Literature or other literature classes. Some medical schools require and a number recommend Comparative Anatomy.
Pre-medical students interested in graduation from this College before attending medical school may major in any subject in which they are interested. Students interested in a pre-osteopathic program should consult the pre-medical adviser.

Students planning to receive a B.S. degree on a combined curriculum (three years here and one year in a medical or a dental school) must fulfill the group and English composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

Medical Technology

The School of Humanities and Sciences offers the courses which satisfy the entrance requirements for Medical Technology internships in the United States, Canada, and Hawaii. A two-year course is required to complete minimal requirements. However, the college provides a three-year course which combined with the internship qualifies a student for the B.S. degree. For this degree program the college has affiliations with the L. D. S. Hospital in Salt Lake City, St. Benedict's Hospital in Ogden, and Thomas Dee Memorial Hospital in Ogden. At the satisfactory completion of the internship, the student is qualified to take the registration examination given by the Registry of Medical Technologist of the American Society of Clinical Pathologists.

For further details contact Garth A. James in the Department of Bacteriology and Public Health.

PRE-DENTAL TRAINING

Students planning to enter the profession of dentistry may take the necessary courses in the school of Humanities and Sciences to satisfy requirements for admission to any school of dentistry in the United States.

Suggested Pre-Dental Schedule

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<tr>
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<tbody>
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<tr>
<td>Chemistry 3, 4, 5</td>
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<tr>
<td>Zoology 3, 4</td>
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<tr>
<td>Mathematics 34, 35, 44</td>
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<tr>
<td>English 40 or 52</td>
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<tr>
<td>Military Science 1, 2, 3 or P. E.</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electives (optional)</td>
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<td>Physics 17, 18, 19</td>
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<tr>
<td>Military Science 4, 5, 6, or P. E.</td>
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<tr>
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<td>Chemistry 125, 126</td>
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<tr>
<td>Zoology 118 or 119</td>
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<td><strong>Total</strong></td>
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*Students with unusually good records may sometimes be 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.
Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

Students planning to receive a B.S. degree on a combined curriculum (three years here and one year in a medical or a dental school) must fulfill the group and English composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

**B. S. IN NURSING**

Persons who have Registered Nurse credentials may pursue studies toward their bachelor of science degree. Credits earned toward the R. N. are applied toward the B. S. as evaluated by the Registrar. Such students may be graduated with a major in Nursing or they may elect to complete their college work in some such field as Public Health or Bacteriology.

**Bacteriology and Public Health**

W. Whitney Smith, Professor and Head of Department; Kenneth R. Stevens, Professor; Lewis W. Jones, Associate Professor; Garth A. James, Assistant Professor; John H. Carliquist, Special Professor; Homer H. Clark, Russell S. Fraser, Earl L. Fillmore, Reed A. Roberts, Special Assistant Professors. Special staff members from the Cache Valley Medical and Dental Associations.

**Bachelor of Science Degree**

General Bacteriology majors should take: Bact. 70, 71, 101, 104-105 or 120, 121, 110, 131, 160, 168, 172, 173, 180, 291; Chemistry 3, 4, 5, 115, 121, 122, 191; Mathematics 35, 44; Physics 17, 18, 19 (6 and 7 are accepted in special cases); Public Health 50; Botany 24, 25; Zoology 3, 4; Library Science 106.

Clinical (Medical Laboratory) Technology Majors should take during their first, second and third years: Bact. 70, 71, 172, 173, 101, 131, 160, 161, 168, 291; Chemistry 3, 4, 5, 12, 17, 18, 190; Physiology 4; Physics 6, 7; Public Health 50; Zoology 3, 4, 116, 122; and meet all college requirements except for total credits and upper division. A hospital internship for twelve months shall be completed during the fourth year, which shall include instruction in Bact. 133, 134, 135, 136, 137, 138, 139. Utah State Agricultural College has made provisions for instruction of laboratory technicians in this internship in the W. H. Groves L. D. S. Hospital in Salt Lake City or the Thomas Dee L. D. S. Hospital in Ogden. During this fourth year, students register for three quarters. When this program is satisfactorily completed, students are eligible for the Bachelor of Science degree in Medical Technology. The 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 Garth A. James for further details.)

Health Education Majors should take: Public Health 15, 50, 156, 254; Bacteriology 10; Physical Education 55, 84, 135, 145, 181; Foods and Nutrition 5, and Child Development.

Physical Education—Health Education composite majors should consult Professor H. B. Hunsaker.

Minors in Health Education should take: Public Health 15, 50, 156; Physical Education 135, 145; Social Work 165; plus Electives, Physical Education 55, 84, 181; Foods and Nutrition 6; Psychology 145 or Social Work 182, and Child Development 67.

Public Health Majors should take: Public Health 15, 50, 151, 152-153, 155; Bacteriology 10 or 70, 71; Dairy 6; Physiology 4; Zoology 3, 4, 111, 116.
Bacteriology majors in Specialized Agriculture should take Bacteriology 10 or 70, 71, 104, 110, 120, 160, 291; Botany 24, 25; Chemistry 10, 11, 12, 190; Mathematics 34 or 35; Physiology 4; Physics 6, 7; Zoology 2 or 3 and 4; Public Health 50.

Bacteriology Majors in Technical Agriculture should take Bacteriology 70 or 10, 71, 104, 110, 120, 160, 172, 180, 291, Public Health 50, Botany 24-25, Zoology 3, 4, Chemistry 3, 4, 5, 115, 121, 122, 191, Math. 35, 44, Physics 17, 18, 19, Library Science 106 plus such other courses in Veterinary Science Poultry Husbandry, Horticulture, Dairy Industry, Animal Husbandry, Agronomy, Foods and Nutrition, Forestry, and/or any other related agricultural subjects as are pertinent to the specific objectives and interests of the student.

Master of Science Degree

Research and graduate courses are available in various specialized subjects, with strong support from related departments and agencies. Courses numbered 200 and above are designed for graduate students. Courses 110, 120, 131, 151, 153, 161, 168, and 180 may be used for credit by graduate majors in Bacteriology. These courses and the following — 104, 105, 151, 156 and 160 — may be modified and used for credit by graduate students in related departments.

Bacteriology

1. Principles of Biology. Basic life principles illustrated in both plant and animal forms. Designed in combination with Bact. 10 or Physiol. 4 to meet the biological science requirements of the college. (5F, W, S) Jones

10. Elementary Bacteriology. Basic concepts, practical applications, demonstrations. (Not open to students who offer credit in Bacteriology 70.) Five lectures (5F, W, S, Su) Smith; Stevens; James

70. General Bacteriology. For majors in science departments. (Not open to students who offer credit in Bacteriology 10.) Three lectures (3F, W, S) Jones

71. General Bacteriology Laboratory. Prerequisite: Previous or concurrent registration in Bact. 10 or 70. Two 3-hour labs. (2F, W, S) Smith, Jones

101. Systematic Bacteriology. Classification relationships. Prerequisite: Bact. 10 or 70. Two lectures. (2S) Alternate years not taught, 1956-57. Smith

104. Dairy Bacteriology. Microorganisms of milk and its products. Prerequisite: Bact. 10 or 70. Three lectures. (3S) Jones

105. Dairy Bacteriology Laboratory. Two 3-hour labs. Prerequisite: Bact. 71, and previous or concurrent registration in Bact. 104. (2S) Jones

110. Soil Microbiology. Relationships of microorganisms to soil fertility. Prerequisite: Bact. 10 or 70. Two lectures. (2W) Taught alternate years. Jones

120. Food Microbiology. Relationships of microorganisms to food preservation, spoilage, and poisoning. Prerequisite: Bact. 10 or 70. Two lectures. (2F) Taught alternate years. Smith

121. Food Microbiology Laboratory. (2F) Smith

131. Clinical Laboratory Methods. Prerequisite: Bact. 71. (4S) James

133, 134, 135. Applied Medical Technology. Practical work in hospital laboratories under close supervision.

Clinical Bacteriology and Serology 2 months Carlquist; Clark
Clinical Biochemistry 3 months Carlquist; Clark
Clinical Hematology 1 month Carlquist; Clark
Pathological Tissue Methods 2 months Carlquist; Clark
Blood Bank Procedures 2 months Carlquist; Clark
Electrocardiograph and Basal Metabolism Procedures (13F, W, S) Carlquist; Clark

136. General Pathology Discussions. (2F) Carlquist; Clark
137. Clinical Laboratory Methods Discussion. (2W) Clark
138. Blood Bank and Blood Serology. Techniques. (1S)  
Clark

139. Pathological Conference. (1S)  
Carlquist; Clark

160. Pathogenic Bacteriology. Properties of pathogens and relationships to infectious diseases. Prerequisite: Bact. 71. Three lectures, two labs. (5F)  
James

Staff

168. Immunology. Prerequisite: Bact. 160. Three lectures, two labs. (5W)  
James

172, 173. Bacteriology Laboratory Methods. (2W, 2S) Smith; Jones; James

James

190. History of Bacteriology. (2S)  
James

291. Seminar. (1F, W, S)  
Staff

294. Special Problems in Bacteriology. Special assignments, reports, and discussions. Preparation of a comprehensive and critical review. Time and credit arranged. Prerequisite: consent of instructor.  
Staff

Staff

Public Health

Public Health courses do not satisfy biological science group requirements.

15. Personal Health. Health problems of college students; especially designed for freshmen and sophomores. Two lectures. (2F, W, S)  
Members of Cache Valley Medical Association

Smith, Jones

Smith, Jones

Stevens; James

Stevens; James

Stevens; James

159. Public Health Laboratory Methods. Experience in the practice of the Public Health Laboratory. (3 to 15 hours credit. Arranged)  
Fraser

254. Special Problems in Public Health. Assignments, reports, discussions. Preparation of a comprehensive and critical review. (Time and credit arranged.)  
Staff

Chemistry

Melvin C. Cannon, Professor and Department Head; Delbert Greenwood, Theodore M. Burton, Professors; Harris O. Van Orden, Norman Bauer, Garth L. Lee, Associate Professors; Sigrid S. Kenington, Instructor. Sherwin Maeser, Professor Emeritus.

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 accredited, and who fill the group requirements of the College as given in the introduction to this catalog, will be certified by the Society. Completion of the suggested schedule below will enable the student to meet all of these requirements.
Students desiring to complete a teaching major in chemistry in preparation for secondary school teaching, or those desiring to take courses in chemistry as part of a composite teaching major should consult with the head of the department for specific recommendations. Required professional education courses for the teaching certificate are listed by the School of Education.

The student interested in obtaining a degree in Chemical Engineering may pursue the first two years of the program in the College. Courses taken under this program will be accepted at other Universities giving the degree. Following the completion of the first two years of study, the student should register in the Chemical Engineering Department at the University of Utah, or another school of his choice. The proposed curriculum of study for Chemical Engineering is listed in this catalog under the School of Engineering.

To aid students in registering, the following suggested schedule is given.

Suggested Schedule

**Freshmen**

A. For students who have completed 1½ units of high school algebra and ½ unit of geometry:

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<th>Course</th>
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<td>Math. 35, 46, 97</td>
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<tr>
<td>English 1, 2, 3</td>
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<tr>
<td>Group requirements in biological and/or social sciences</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Physical Education or Military Science and Tactics</td>
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<tr>
<td><strong>Total</strong></td>
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B. For students who enter college with credit for only 1 unit of algebra and ½ unit of geometry:

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<td>Chemistry 3, 4, 5</td>
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<tr>
<td>Math. 34, 35, 46</td>
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<td>English 1, 2, 3</td>
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<tr>
<td>Group requirements in biological and/or social sciences</td>
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<td>Physical Education or Military Science and Tactics</td>
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<td><strong>Total</strong></td>
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**Sophomores**

A. For students with mathematics:

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<td>Math. 98, 99</td>
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<td>Physics 20, 21, 22</td>
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<tr>
<td>Chemistry 17, 18, 101</td>
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<tr>
<td>Lower Division requirements</td>
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<tr>
<td>Physical Education or Military Science and Tactics</td>
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<td>1</td>
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<tr>
<td><strong>Total</strong></td>
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B. For students with incomplete mathematics:

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<td>Math. 97, 98, 99</td>
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<tr>
<td>Physics 20, 21, 22</td>
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<td>Chemistry 17, 18, 101</td>
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<tr>
<td>Lower Division group requirements</td>
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<td>Physical Education or Military Science and Tactics</td>
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Juniors

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Seniors

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<td>Chemistry 191</td>
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<td>English 111</td>
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<td>Physics 120, 121, 130</td>
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<td>Electives (must include at least 3 credits adv. Chem.)</td>
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Master of Science Degree in Chemistry

The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical. Besides graduate courses (in the 200 series), courses 116, 124, 135, 155, 191 may be used towards the Master's degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's degree by other departments if the student's supervisory committee approves.

Before admission to candidacy for the degree, all graduate students are required to pass the National Cooperative Test examinations of the American Council of Education for undergraduate training in General Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry.

Courses

3, 4, 5. Chemical Principles and Qualitative Analysis. Introduction to chemical theory and principles of chemistry including introductory qualitative analysis. Prerequisites: high school chemistry or physics, algebra and geometry. For science majors, pre-medical and pre-dental students, home economics majors in foods and nutrition. Three lectures, two labs. (5F, 5W, 5S)

Lee, Kennington

10, 11. General Chemistry. Fundamental principles of inorganic chemistry. Open to any matriculated student. Students with a grade of B or higher may enter Chemistry 5 in the spring quarter. Prerequisite: One unit of high school or college algebra. (5F, 5W, or 5W, 5S)
12. Organic Chemistry. Elementary principles of organic chemistry. This course is designed to follow Chemistry 11 and completes a one year terminal course in chemistry. (5S) Lee, Kennington

17, 18. Quantitative Analysis. Theory and practice of gravimetric and volumetric analysis. A terminal course for majors in agriculture and home economics. Prerequisite: Chem. 5. (5F, 5W) Cannon

31, 32, 33. Physical Science. Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of all three quarters. (5F, 5W, 5S) Staff

101. Elementary Physical Chemistry for Biologists. A lecture-recitation type survey of basic quantitative laws governing chemical processes, applied to examples of biological interest. Mathematical derivations are kept to a minimum. Recommended as a prerequisite for those interested in biological or medical research. Prerequisites: Chemistry 12; or Chemistry 5; Math. 34 or equivalent. (5S) Bauer

104, 105, 106. Physical Chemistry. Quantitative methods for solving problems in chemical thermodynamics, electrochemistry, reaction kinetics, phase rule and quantum theory. Prerequisites: Chemistry 5, 18; Physics 20, 21, 22; Math. 99 or special permission. (5F, 5W, 5S) Bauer

108. Dairy Chemistry. The chemistry of milk and milk products, including tests for adulterants, preservatives, and routine methods of quantitative analysis of dairy products. Taught alternate years. Prerequisites: Chemistry 12, (or equivalent) and Chemistry 190. (Taught 1957-58 and alternate years.) (4W) Van Orden

109, 110, 111. Physical Chemistry Laboratory. To accompany Chemistry 104, 105 and 106. Prerequisite: Chemistry 155 or by special permission. (1F, 1W, 1S) Bauer

115. Quantitative Analysis, A Brief Course. Basic theory and laboratory practice of quantitative analysis. A terminal course designed primarily for pre-medical and pre-dental majors. Prerequisites: Chemistry 5. (5S) Cannon

116. Inorganic Preparations. A laboratory course in practical laboratory methods of synthetic inorganic chemistry. Prerequisites: Chemistry 5. Any quarter. Time and credit arranged. (IF, 1W, 1S) Lee

121, 122, 123. Organic Chemistry. Fundamentals of chemistry of carbon compounds. Terminal at the end of the second quarter for non-chemistry majors who do not desire more than ten hours credit. Prerequisites: Chemistry 5 or Chemistry 11. (5F, 5W, 5S) Burton

124. Organic Preparations. An advanced laboratory course in the synthesis of more complex compounds. Prerequisite: Chemistry 123. (5F) Burton

135. Chemical Literature. Exercises in finding, assembling and using information available in technical publications. (5S) Burton

155. Glass Blowing. A laboratory course in the technique of manufacture and repair of laboratory glassware. (2W) Burton

160. Seminar. (1F, 1W, 1S) Time arranged. (IF, 1W, 1S) Staff

190. Elementary Biochemistry. The chemistry of carbohydrates, fats, proteins, enzymes, vitamins, hormones and minerals and their transformations in plants and animals. Prerequisite: Chemistry 12. Terminal course. Not considered to serve as prerequisite for Advanced Biochemistry. (5F) Van Orden

191. Fundamentals of Biochemistry. The chemistry of carbohydrates, fats, proteins, enzymes, vitamins, hormones and minerals and their transformations in plants and animals. Prerequisite: Chemistry 122. Prerequisite for Advanced Biochemistry. (5S) Van Orden

198. Undergraduate Research Problems. Any quarter. Time and credit arranged. (IF, 1W, 1S) Staff

215. Chemical Thermodynamics. Application of basic thermodynamic principles to selected physical-chemical problems. Prerequisites: Chemistry 106; Math. 99. (5F) Bauer
225, 226, 227. **Advanced Organic Chemistry.** Lecture course for graduate students. Includes modern theories and special topics in organic chemistry. (Taught 1956-57 and alternate years) Prerequisites: Chemistry 123, 106. (3F, 3W, 3S) Burton

232. **The Colloidal State and Surface Chemistry.** Fundamental properties of colloidally dispersed systems. Application of physical-chemical principles to surface and membrane phenomena. Examples of colloidal behavior are selected from diverse fields of interest, such as: industrial catalysis, dairy processing, cell physiology and soil mechanics. Prerequisites: Chemistry 106; Math. 99. (5W) Bauer

234. **Qualitative Organic Analysis.** The classification, reactions and laboratory work involved in identification of unknown organic compounds. (Taught 1955-56 and alternate years) Prerequisites: Chemistry 106; Math. 99. (3S) Burton

250. **Advanced Inorganic Chemistry.** Based on the periodic table and atomic structure. Designed for chemistry seniors and graduates and others having similar training. (Taught 1956-57 and alternate years) (3S) Lee

252. **Chemical Forces and Molecular Structure.** An interpretation of chemical and physical properties of matter in terms of electrostatic and electro-dynamic forces between fundamental particles. Structural properties derived from X-ray crystallography are emphasized. (Taught 1957-58 and alternate years) Prerequisites: Chemistry 106; Math. 99. (5S) Bauer

253. **Chemical Kinetics.** Fundamental principles governing reaction rates, including heterogeneous catalytic reactions. Applications to selected problems in chemistry, agronomy and biology. (Taught 1956-57 and alternate years) Prerequisites: Chemistry 106; Math. 99. (5S) Bauer

270. **Chemical Microscopy.** Lecture and laboratory practice in use of the microscope and its accessories as applied to chemistry with special reference to rapid qualitative methods and analysis of minute amounts of material. Prerequisite: Chemistry 18. (Time and credit arranged.) Cannon

272. **Optical Methods of Chemical Analysis.** Problems in spectroscopy, spectrophotometry, colorimetry, refractometry, and microscopy. Prerequisites: Chemistry 18 and 106, or special permission. Taught 1957-58 and alternate years) (3F) Cannon

273. **Electro-Chemical Methods of Analysis.** Instruction in potentiometry, polarography, electro-analysis, and related methods as applied to analytical chemistry. (Taught 1957-58 and alternate years.) Prerequisites: Chemistry 18, 106. (3W) Cannon

274. **Advanced Quantitative Analysis.** Special problems in quantitative analysis. Prerequisite: Chemistry 18. Time and credit to be arranged. Cannon

289. **Animal Metabolism.** Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in animals. Chemical and biological tests made on rations, animal tissues, blood, urine, and other secretions and excretions when indicated. Time and credit arranged. Greenwood

292. **Biochemistry.** Problems in metabolism, micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisite: Chemistry 190 or 191 or equivalent. (3F) Greenwood

293. **Biochemistry.** Preparations of enzymes or amino acids as arranged. Prerequisite: Chemistry 190 or 191. Time and credit arranged. Any quarter. Greenwood

294. **Biochemistry.** Microbiological and colorimetric methods for determination of vitamins and amino acid in plant and animal tissues. Prerequisite: Chemistry 190 or 191 and Bact. 70 or 71. (3W) Or by special permission. Greenwood

295. **Advanced Biochemistry.** Enzymes and their functions in plants and animals. (Taught 1957-58 and alternate years) Prerequisite: Chemistry 190 or Chemistry 191, Chemistry 122. (3F) Van Orden
296. Advanced Biochemistry. Carbohydrates, fats, proteins and minerals and their metabolism in plants and animals. (Taught 1957-58 and alternate years) Prerequisite: Chemistry 190 or Chemistry 191, Chemistry 122. (3W) Van Orden

297. Advanced Biochemistry. Vitamins and hormones and their functions in plants and animals. (Taught 1957-58 and alternate years) Prerequisite: Chemistry 190 or 191, Chemistry 122. (3S) Van Orden

298. Research. Graduate students majoring in chemistry may elect research in any branch of the subject. Any quarter. Time and credit arranged. Staff

English and Journalism

Major and Minor Requirements

King Hendricks, Professor and Department Head; Carlton Culmsee, Hubert W. Smith, Wendell M. Keck, Ira N. Hayward, *Moyle Q. Rice, Professors; Maxwell D. Edwards, Thornton Y. Booth, John J. Stewart, Blair Hansen, J. Lynn Mortensen, J. Golden Taylor, Assistant Professors; Pearl S. Budge, Veneta Nielsen, John S. Bullen, L. Grant Reese, Instructors.

Wallace J. Vickers, Professor Emeritus.

English Major: A minimum of fifteen hours in the junior division course work drawn from American and English and World Literature; a minimum of thirty hours of senior division course work. Two years or twenty-four quarter hours of a foreign language.

English Teaching Major: Same as major except for the language requirement.

English-Speech Composite Major: A minimum of thirty-five hours of course work approved by the head of the English department. (See speech department for speech requirement.)

English Teaching Minor: In order to obtain the recommendation of the English department, a teaching minor must present a minimum of twenty-five hours of English course credit and such credit must have the approval of the head of the English department.

Majors and minors should consult with the head of the English department as early in their college career as possible.

1, 2, 3. Basic Communication. Required of all freshmen. (3F, 3W and 3S) Staff

4. Elements of Grammar. Designed for students who wish training in grammar beyond that given in Basic Communication. (3F, W or S) Staff

5. Vocabulary. A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (3F, W or S) Keck; Hansen

12. Practice in Composition. A course designed for students who want practice in composition beyond that given in Basic Communications. (Section 2 especially designed for foreign students.) (3F, W or S) Staff

31. Floating Poetry. Poetry that has lived in oral tradition since medieval times. (3) Not taught 1956-57. Hendricks

32. Readings in Poetry. To develop appreciation for poetry. Verse forms, various types of poems, and the idea underlying lasting poetry are considered. (3F or W) Nielsen

*On leave of absence.
33. Readings in the Short Story. (3F, W or S) Rice
37. Readings in the Novel. (3F, W or S) Booth
40. World Literature before 1650. (5F, W or S) Edwards; Hansen; V. Nielsen
41. World Literature from 1660 to the Present. (5F, W or S) Edwards; Hansen; V. Nielsen
42. Readings in Mythology. (3S) Reese
46. The Bible as English Literature. (5F) Vickers
48. Modern European Literature. (3S) M. L. Nielsen
53. American Literature, Early Period. (5F, W or S) Smith; Taylor
54. American Literature, Late Period. (5F, W or S) Smith; Taylor
58. Modern American Literature. (3F) Smith; Taylor
60. English Literature, Early Period. (5F, W or S) Booth; Reese
61. English Literature, Late Period. (5F, W or S) Booth; Reese
63. Readings in Shakespeare. (3F) Vickers
68. Modern English Literature. (3W) Edwards

Senior Division

104. Grammar. A course designed for teachers. (3S) Vickers
105. History of the English Language. (3W) Hendricks
110. Advanced Composition. For students who have taken English 10; may be taken in place of English 19 by students who have credit in English 17 and English 18 and who have transferred from Forestry or Engineering; may be taken by transfer students who have six credits in Composition. Emphasizes vocabulary, selection, and clear organization of information. (4F, W or S) Staff
111. Technical Writing. Emphasis upon bibliography, research methods and final form of the technical report. Open to juniors and seniors only. (3F, W or S) Keck; Booth
112. Advanced Writing Problems. A practical course in special problems of writing, such as letters of application, summary abstracts, short reports, and informal articles; mainly for juniors and seniors in forestry or engineering who do not take 111. (3W or S) Keck
117. Creative Writing.
   a. Short Stories. (3F) Rice
   b. Essays. (3W) Rice
   c. Poetry. (3S) V. Nielsen
122. Children's Literature. A study of the prose and poetry of children to the junior high school age. (3F or W) Mortensen
123. Literature for Adolescents. The prose and poetry of the high school age. (3S) Mortensen
124. The Teaching of English. See Education 124. (4S) Budge
134. Literary Criticism. Masterpieces of criticism from Plato and Aristotle to Croce. (4S) Culmsee; Edwards
142. European Literature of the Renaissance. (5W) M. L. Nielsen
147. Comparative Literature. The Eighteenth Century in France and England. (5F) Hendricks
148. Comparative Literature. The Romantic Period in England and Germany. (5W) Hendricks
149. Comparative Literature. The Nineteenth Century in England and Europe. (5S) Hendricks
151. American Fiction. Nineteenth and early Twentieth Century fiction writers. (3S) Smith

154. Major American Authors. Intensive studies of the chief American novelists, poets, and essayists of the Nineteenth Century: a. Edgar Allen Poe; b. Ralph Waldo Emerson; c. Nathaniel Hawthorne; d. Herman Melville; e. Mark Twain; f. Henry James; g. Walt Whitman. These courses are taught when required. (2) Smith; Hayward; Taylor

162. Chaucer. (5F) Hendricks


164. Shakespeare. The Tragedies. (5S) Vickers

165. Major English Authors. a. Donne; b. Johnson and Boswell; c. Shelley; d. Tennyson; e. Browning; f. Arnold. These courses are taught when required. Smith; Rice; Booth


170. Milton. (3W) Vickers

175. Literature of the English Renaissance. (5F) Taught 1957-58. Rice

180. Restoration and Eighteenth Century. (5F) Keck

190. The Romantic Period. (5W) Smith

191. The Victorian Period. (5S) Booth

199. Readings and Conference. Time and credit arranged. Any quarter. Students must have the approval of the head of the department.


201. Bibliography and Methods. Required of all candidates for the Master's degree. (5F) Smith

209. Anglo-Saxon. Required of all candidates for the Master's degree (5S) 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 or S) Keck

252. Seminar in American Literature. (3W) Smith

261. Seminar in Middle English Literature. (4W) Hendricks

280. Seminar in Eighteenth Century Literature. (3W) Hendricks; Keck

290. Seminar in Nineteenth Century Literature. (3W) Booth

Journalism

Major students in Journalism should complete Journalism 1 through 6, 12, 13, 14, 16, 81, 91, 96, 112, 114, 115, 125, 156, or 164, 166; Photographic Journalism 51, 151; English 5, 10, 53, 110, 117 or 118 or 119.

They are urged to complete as many of the following as possible: Journalism 81, 182; English 40, 46, 60, 63, 105, 134. It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, English, History, Modern Languages, Political Science, Psychology, Sociology, Speech.

Majors in Agricultural Journalism and Home Economics Journalism, designed to meet needs of individuals, are available.

1, 2, 3. College Journalism. For members of Student Life Staff. Discussions of newspaper and responsibilities of journalists. (1F, 1W, 1S) Stewart

4. 5. 6. College Journalism. Second year. (1F, 1W, 1S) Stewart
12. Reporting. Lectures on the historical, social and vocational aspects of the various fields of journalism: newspaper, magazine, book, radio, television, motion picture, public relations, advertising, teaching; also, the psychology of news. (3F)

Stewart

13. Reporting. A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12 (3W)

Stewart


Stewart

16. Copyreading. Primarily a laboratory course in handling newspaper copy, headline, page layouts. Prerequisite: Journalism 12, 13. (3F)

Stewart

81. Introduction to Radio and Television. (See Speech Department for description.) (3F)

B. Hansen

82. Radio Speech. (See Speech Department for description.) (3W)

B. Hansen

83. Elements of Broadcasting. (See Speech Department for description.) (3S)

B. Hansen

91. Weekly Paper. Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly. (3W) Taught alternate years.

Stewart

92. Weekly Paper Internship. Six weeks work in the summer on a weekly newspaper. Prerequisite: 91. (Arranged)

Staff

96. Growth of Mass Media and Propaganda. Development of American publications and electronic means of disseminating information and propaganda; also main currents in thought conveyed by these media. (5S)

Culmsee

112. Writing Feature Articles. Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals is made to determine available markets and what editors buy. (3W)

Culmsee

114. Writing for Radio. Study and practice in writing information and continuity for radio programs. (3W) Taught alternate years.

Stewart

115. Law of the Press. Law of libel, right of privacy, contempt of court, copyright, and postal regulation. (2W) Taught alternate years.

Culmsee

120. Journalistic Techniques. For non-journalism majors. Techniques which aid professional people, extension workers and others to use newspapers, magazines and radio for publicity and information purposes. (3F)

Stewart

125. Editorial Page. A study of editorials and other elements of the modern editorial page, and the writing of editorials. (3F)

Stewart

156. Principles of Advertising. (See Merchandising Department, School of Business and Social Sciences, for description.) (5W)

Fillmore

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: 12, 13, 14 or permission of instructor. (3S)

Stewart

166. Journalism Practices. Laboratory work in publications or radio stations. (2F, 2W, 2S)

Staff

182. Radio Newscasting and Writing. Offered in both Speech and Journalism Departments. Study and application of principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5W) Taught alternate years.

B. Hansen; Stewart

185, 186, 187. Special Problems in Journalism. (1-2F, 1-2W, 1-2S) Staff
Photography and Photographic Journalism

Bert V. Allen, Head, Department of Photography, Instructor in Photography.

For a major in Photography, a student must meet the standard requirements of the college relative to upper and lower division courses.

For a major in Photographic Journalism, a student should study the following courses in addition to the Photography listed below: Journalism 12, 13, 14, 16, 112, 115 and 156 or 164.

General service courses are available for students desiring instruction in fundamentals of photography. Some courses are designed especially for students of Agriculture, Engineering and Technology, Forest, Range and Wildlife Management, and other technical or professional subjects in which photography is highly useful.

Description of Courses

51. General Photography. Principles and practices in fundamentals of general photography. Training in selection and use of cameras, lenses, meters, films, filters, lights, developers, and accessories. Two lectures, one 3-hr. lab. (3F, W or S) Allen

61. General Photography Laboratory. Additional lab work to supplement Photography 51 for those desiring more than 3 credits of work. Two 3-hr. labs. (2F, W or S) Allen

151. Photographic Problems. Designed to help students solve advanced photographic problems. May be repeated provided that a different type of photographic work is taken each time the student registers. Repeating students must have approval of major professor and department head. Prerequisite: Photography 51. One lecture, two 3-hr. labs. (3F, W or S) Allen

163. Commercial and Scenic Photography. Training in all types of outdoor photography including scenic, agricultural, livestock, wild life, and plant life. Suited to students in Forest, Range and Wildlife Management and in all phases of agriculture. Aerial photography is included as it applies. Prerequisite: Photography 51. Two lectures, three 3-hour labs. (5S) Allen

165. Portrait Photography. Training in portrait and group photography. Units include model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Considerable emphasis is placed upon child and home portraiture. Prerequisite: Photo 51. Two lectures, three 3-hr. labs. (6W) Allen

166. Color Photography. Problems in color. Ektachrome, Anscochrome, and Ektacolor; use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32, Photo 51. Three lectures, two labs. (6F) Allen

Geology

J. Stewart Williams, Professor and Head of Department; Clyde T. Hardy, Associate Professor; Donald R. Olsen, Instructor.

Geology Club: The Geology Club, under general supervision of the department, is an organization for all geology majors. Meetings are held twice each month and programs consist of lectures by professional geologists. Two field trips are conducted each year. Regular attendance is required of all majors; all interested persons are invited to attend.

Bachelor of Science Degree

Minimum Requirements: All majors must satisfactorily complete the following basic courses: Chemistry 10, 11, 12; Civil Engineering 84; Engineering Drawing 61, 63; English 111; Geology 3, 4, 5, 101, 102, 108, 110, 111, 113, 114, 116; Mathematics 35, 46; Physics 17, 18, 19; and Zoology 3.
mended electives are Mathematics 97, 98, 99; German 1, 2, 3; Civil Engineering 181; Photographic Journalism 51; Chemistry 3, 4, 5; and Physics 20, 21, 22.

Field Trips: Majors should reserve Saturdays during Fall and Spring quarters for field trips.

**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.

**Courses**

1. **Introductory Physical Geology.** For students in nonscience areas. (5F, W or S)  
   Staff

2. **Physical Geology.** For students in Geology, Forestry, Engineering, Agronomy, etc. (5F, W or S)  
   Staff

3. **Historical Geology.** Physical history of the earth and the development of life as indicated by the geologic record. Prerequisite: Geol. 1 or 3. (3F, W or S)  
   Staff

4. **Minerals, Rocks and Fossils.** Identification of common minerals, rocks and fossils. Prerequisite: Geol. 3. (3S)  
   Staff

5. **101. Mineralogy.** Identification of minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geol. 3 and Chem. 10, 11 and 12. (5F)  
   Olsen

6. **102. Optical Mineralogy and Petrography.** Determination of minerals utilizing the petrographic microscope. Classification of igneous rocks. Prerequisites: Geol. 101 and Physics 19. (5W)  
   Olsen

7. **103. Engineering Geology.** Application of geology to engineering problems. For seniors in Engineering. (3S)  
   Williams

8. **104. Invertebrate Palentology.** Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geol. 4 and Zool. 3. (5S)  
   Williams

9. **105. Stratigraphy and Sedimentation.** Prerequisite: Geol. 3. (5W)  
   Hardy

10. **106. Structural Geology.** Prerequisite: Geol. 3. (5F)  
    Hardy

    Hardy

12. **108. Economic Geology.** Geologic occurrence of metallic and nonmetallic mineral deposits. Prerequisites: Geol. 101 and 110. (5S)  
    Olsen

13. **114. Geologic Field Methods.** Preparation of geologic and topographic maps utilizing the plane table. Measurement of stratigraphic sections. Survey of geophysical techniques. Prerequisites: Geol. 3 and Civil Engineering 84. (5S)  
    Hardy

14. **115. Advanced Physical Geology.** Processes of erosion. Action and development of streams. Land forms. Subsurface water. Prerequisites: Geol. 3 and college mathematics, chemistry, and physics. (5F)  
    Williams

15. **116. Special Problems.** Directed study of selected problems. Written report required. (1-6F, W or S)  
    Staff
117. Ground-Water Geology. Geologic conditions that control the occurrence and purity of ground water with special reference to western United States. Prerequisite: Geol. 3. (4W) Williams

210. Seminar. Prerequisite: Graduate standing. (2-5F, W or S) Staff

220. Thesis. Prerequisite: Graduate standing. (5-15F, W or S) Staff

Landscape Architecture and Planning

Laval S. Morris, Professor and Head of Department; Kenji Shiozawa, Assistant Professor.

The Department of Landscape Architecture and Planning is concerned with the design and development of land areas for use in relation to man’s needs. Land use is of prime importance in the evolution of a plan or design, and constant endeavor is made to turn out work that is functional.

Courses Required to Graduate in the Department of Landscape Architecture and Planning

The following courses are intended to provide: (1) necessary instructional material directly concerned with Landscape Architecture and Planning. (2) Supporting courses listed in fields which are closely related, such as Civil Engineering, Art, Horticulture, and Botany. (3) Courses required in the various fields of Science and Art for liberal education. These courses are required by students regardless of the department in which they graduate.

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<th>Freshman</th>
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<tr>
<td>Elem. of Landscape Arch.</td>
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<td>Plant Propagation, Hort. 6</td>
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<td>Design, L. A. 140, 141, 142</td>
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<tr>
<td>Landscape Constr. 160, 161, 162</td>
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<td>Recreational Planning, L. A. 130</td>
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<td>Adv. Comp., Engl. 110</td>
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<td>Economics 51, or Agr. Econ. 58</td>
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<td>L. A. 180, 181, 182</td>
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Students in the School of Agriculture take those agricultural subjects listed in the college catalog as necessary requirements.

3. Elements of Landscape Architecture and Planning. Relation of people to land regions and small areas. Principles of design and composition applied to various types of land planning. Design of home grounds is emphasized. Field trip required. (3F or S) Morris; Shiozawa

20. Drawing. A general course to acquaint students with use of instruments. Necessary to all design courses. Lettering, general drafting, perspective drawing, light and shade studies. (3F or W) Shiozawa

30. History and Literature of Landscape Architecture. The history of landscape architecture and its relation to architecture and other allied arts. Present trends and future possibilities are emphasized. (5W) Morris

35. Theory of Design. A study of form in relation to vertical mass and horizontal space. Abstract design is studied and the resultant forms transposed into concrete space and mass relationships. The chief purpose is to provide the student with an awareness of design as early in his training as possible. (8W) Staff

40, 41. Plant Materials. Classification, identification, ecological requirements and uses of woody and herbaceous plants for landscape purposes. Both native and introduced plants studied. (5F, S) Shiozawa

60, 61, 62. Architectural Design. Study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. (2F, W, S) Staff

130. Recreational Planning. Public and private recreation in relation to design, construction and operation. National and state parks and forests studied as they pertain to recreation. Field trip required. (2S) Shiozawa

135. Travel Course. A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least twice during their training. Time and credit arranged. Staff

140, 141, 142. Design. Design of private and public properties based on principles of utility and composition. Prerequisites: L. A. 3, 20; and Civil Eng. 81, 82. (2F, W or S) Staff

150, 151, 152. Planting Design. Pictorial compositions and planting plans developed together. Designed to develop the student's ability to visualize the finished landscape. (2F, W, S) Morris


165. Construction Methods and Practice. For students who intend to become contractors or go into maintenance work. Students work in the field on construction projects involving grading, general construction and planting. Registration by permission during summer. Credit arranged. Staff

170. Town and City Planning. Gathering and analyzing data for town and city planning. Land use, zoning circulation, recreation, housing. (3F) Morris

180, 181, 182. Advanced Planning and Design. Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (3F, W or S) Morris

190. Special Problems. Selected problems to meet the needs of individual students for completion of training. Registration by permission only. Any quarter. Time and credit arranged. Staff

195. Seminar. Readings and discussions. (1W) Staff

210. Advanced Problems in Design and Planning. Time and credit arranged. Staff
Mathematics

Neville C. Hunsaker, Professor and Head of Department; V. H. Tingey, Professor; Mary Nelson, Joe Elich, Associate Professors; Wayne R. Rich, Assistant Professor; Sidney W. Bingham, Instructor.

Two types of majors are offered by the Mathematics Department. Students intending to enter graduate study in mathematics take the regular major. Those intending to teach in high schools take the regular major or the teaching major.

Regular majors are required to take mathematics 130, 131, 132 and fifteen additional credit hours of upper division mathematics. Regular majors should have a reading knowledge of either French or German. Physics 20, 21, and 22 and nine credit hours of upper division physics are recommended.

Students expecting to teach mathematics in high school must meet the state requirements for certification in addition to meeting the requirements of a regular major in mathematics.

A minor in mathematics shall consist of two quarters of Differential and Integral Calculus, Physics 20, 21, 22, and 15 hours of Chemistry.

All students majoring in mathematics must have had plane and solid geometry. Plane geometry is a prerequisite for all college mathematics.

Courses

B. Plane Geometry. (F or W)

33. Solid Geometry. (2ForW) Prerequisite: two years high school algebra, or mathematics 34

34. Introduction to College Algebra. Prerequisite: one year of high school algebra. Students who have had more than one year of high school algebra are not given college credit for mathematics 34. Daily. (3F, W or S)

35. College Algebra. Prerequisite: 34. (5F, W or S)

44. Plane Trigonometry. Prerequisite: 35. (3F, W or S)

46. Plane and Spherical Trigonometry. Prerequisite: 35. (5F, W or S)

50. Descriptive Astronomy. (3S)

60. Mathematics of Finance. Prerequisite: Math. 35.

97. Plane and Solid Analytical Geometry. Prerequisite: 35, and 44 or 46. (5F, W or S)

98. Differential Calculus. Prerequisite: 97. (5F, W or S)

99. Integral Calculus. Prerequisite: 98. (5F, W or S)

110. Calculus and Differential Equations. Prerequisite: 99. (5S)

118. Modern Algebra. Prerequisite: 99. (3W)

119. Theory of Equations. Prerequisite: 99. (3W)

120. Modern Geometry. Prerequisite: 97. (3W)

122. Ordinary Differential Equations. Prerequisite: 99. (3F or S)

123. Number Theory. Prerequisite: 99. (3S)

124. Foundations of Mathematics. (3S)

130. Advanced Calculus. Prerequisite: 100. (3F)

131. Advanced Calculus. Prerequisite: 130. (3W)

132. Advanced Calculus. Prerequisite: 131. (3S)

145. Vector Analysis. Prerequisite: 99. (3F)
150. The Teaching of Mathematics in the Elementary and High School. (3F or S)

153. Mathematical Readings. Prerequisite: 123. (3S)

246. Tensor Analysis. Prerequisite: 145. (3W)

254. Theory of Functions. Prerequisite: 132. (3F)

255. Theory of Functions. Prerequisite: 254. (3W)

256. Theory of Functions. Prerequisite: 255. (3S)

257. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 132. (3F)

258. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 257. (3W)

259. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 258. (3S)

DIVISION OF STATISTICS

Degree: 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 in the Division of Statistics.

Students wishing to major or minor in statistics will take the course 160 to 167 inclusive in the Division of Statistics, and Mathematics 122, 130, 131 and 132.

160. Determinant and Matrix Theory. (3F)

161. The Calculus of Probability. (5F)

162. Mathematics of Statistics. (5F)

163. Mathematics of Statistics. (5W)

166. Sequential Analysis and the Control of Quality of Output in Manufacturing. (3W)

167. Statistical Reading and Reports. (3S)

Military Science and Tactics and Air Science

A department major in Military Science and Tactics or Air Science is offered in the School of Humanities and Sciences. This major is intended to serve two categories: Those service personnel stationed at near-by military installations who desire to complete a degree while in the service; and college students who are interested in the possibility of making a career of the service. Students electing this major are required to complete a dual major. The purpose of the dual major, as pertains to the regular college student, is to assure the student of adequate preparation for his future in the event he is not selected or cannot qualify for a reserve commission in the Armed Forces. All majors at this institution are acceptable as a dual major but the following are particularly recommended: Engineering, Physics, Chemistry, Mathematics, English, Political Science, or Psychology. A freshman student electing Military or Air Science as a major is advised to pursue one of the above mentioned majors.
Army ROTC

A freshman contemplating a major in Military Science and Tactics should concentrate on filling lower division group requirements including required Military Science courses, and strive for a high grade point average. High scholarship is one of the requisites for selection to the Advanced ROTC course. (Other qualifications are shown in "Military Science and Tactics" section in the latter part of the catalog.)

It is not possible to qualify for a major in Military Science and Tactics if the student is not selected for Advanced ROTC. The first year advanced students with highest scholarship and leadership qualities are selected "Distinguished Military Students." The best qualified of the "Distinguished Military Students" are named "Distinguished Military Graduates" in the first year of the advanced program. These "Distinguished Military Graduates" may apply for a commission in the Regular Army. All of the advanced ROTC students offered commissions are expected to serve on active duty upon graduation.

Air Force ROTC

It is not possible to qualify for a major in Air Science if the student is not selected for advanced AFROTC. Lower division students desiring a major in Air Science must maintain a high grade point average as academic excellence is one of the criteria for selection for the advanced course. Outstanding advanced course students are appointed "Distinguished AFROTC Cadets" at the end of their first year. Upon completion of the second year of the advanced course, the best qualified "Distinguished AFROTC Cadets" are appointed "Distinguished AFROTC Graduates." Those students appointed "Distinguished AFROTC Cadets" are eligible, during their senior year, to apply for a commission in the Regular Air Force. Those selected receive regular commissions upon graduation; all other students completing the program are commissioned in the Air Force Reserve. All students commissioned are required to serve three years on active duty with the Air Force except veterans.

See the "Military Science and Tactics and Air Science" section in the latter part of the catalog for a complete statement of regulations and courses.

Modern Languages and Latin

George A. Meyer, Professor and Head of Department; *M. L. Nielsen Professor; Thelma Fogelberg, Associate Professor; Aldyth Thain, Jesse Nelson, *Gordon E. Porter, Assistant Professors.

Intensive elementary language courses are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in a shorter time than is required for standard elementary courses. One hour daily is usual for lecture and one hour for drill in oral-aural training. The equivalent of a standard first year of modern language is completed in two quarters. Specific courses for advanced work are provided for students who have satisfactorily completed the intensive two quarters' course.

*On leave.
Standard 5-credit elementary courses are provided for students whose aim is primarily a reading and some speaking knowledge of a foreign language and not satisfying of language requirements.

No credit in a beginning language may be used towards graduation until at least 14 credits have been accumulated.

Major in a modern language: (Prospective majors are advised to enroll in the intensive courses.)

French: The following courses are required: 1, 2, 3, 101, 102, 105, 110, and twelve credits in courses numbered above 110.

German: Forty-five credits including courses 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

Language credit by special examination—Students who have acquired a working knowledge of a foreign language by residence abroad may obtain a maximum of 15 hours of credit in that language by taking a special examination. Such an examination is given only in those languages in which the department has an instructor competent to examine the student. At present, examinations may be taken in French, German, Spanish, Portuguese, Norwegian, Swedish, and Danish.

In addition to the elementary courses regularly listed below, permissible special examination credit is listed as Norwegian 1, 2, 3; Swedish 1, 2, 3; and Danish 1, 2, 3.

**French**

1A, 2A. Elementary French. Intensive Course. Two hours daily. (7F, W)

1, 2, 3. Elementary French. (5F, 5W, 5S)


102A. Intermediate French. (3F)

101, 102, 103. Intermediate French. (3F, 3W, 3S)

105. Advanced Composition and Conversation. (3W)

106, 107, 108. Selective Reading. Open to students who have completed French 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S)

109. French Short Story. Students of the French Conte as a literary form serves as an introduction to literary movements in France. Special emphasis on the 19th century. (3S)

110. French Phonetics. Principles of French pronunciation and their practical application. (3F)

112. 19th Century French Poetry. (3W)

115, 116, 117. French for Graduate Students. Short, basic course designed to give graduate students a reading knowledge of French as a help towards issuing advanced degree language requirements. (3F, 3W, 3S)

120. Comedies of Moliere. Moliere’s plays as social criticism. (3F)

121. French Classic Drama. Plays of Corneille and Racine. (3W)

122, 123. Nineteenth Century French Drama. Romantic and Realistic schools. (3W) (3S)

125, 126. Survey of French Literature. (3W) (3S)

129, 130. French Literature of the 18th Century. Special emphasis on the philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. (3F, 3W)

131. Comedies of Beaumarchais and Marivaux. (3S)

135, 136, 137. Nineteenth Century French Novel. (3F, 3W, 3S)

**German**

1A, 2A. Elementary German. Intensive Course. Two hours daily. (7F, 7W)

1, 2, 3. Elementary German. (5F, 5W, 5S)

101A. Intermediate German. Intensive. (5S)
101, 102, 103. Intermediate German. (3F, 3W, 3S) 
105. Advanced Composition and Conversation. (3W) 
106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S) 
110, 111, 112. Scientific German. Reading of scientific texts. Reports. (2F, 2W, 2S) Open to students after completion of 101 or equivalent. 
120. Die deutsche Novelle im 19. Jahrhundert. Reading and discussion of representative stories by Hauff, Storm, Meyer, Keller and others. (3F) 
121. Lessing—Plays and Biography. (3) 
122. Schiller—Poetry, Plays and Biography. (3S) 
123. Die deutsche Novelle im 20. Jahrhundert. Representative stories by Thomas Mann, Heinrich Mann, Herman Hesse, Arthur Schnitzler and others. (3) 
125. Survey of German Literature. (3S) 
130. Goethe’s Faust. Prerequisite: Two years of College German or equivalent. (3W) 
131. Goethe’s Prose. Werther, Dichtung und Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) 
133. Schiller-Poetry, Plays and Biography. (3S) 
150. Phonetics and conversation. Especially for returned missionaries and others who have had experience with the language abroad. (3) 
153. Thomas Mann—Novels, Novellen and Essays. His life and philosophy. The course is conducted in English and readings are in translation. Either German or English credit is given. (3) 

**Spanish**

1A, 2A. Elementary Spanish. Intensive Course. Two hours daily. (7F, 7W) 
1, 2, 3. Elementary Spanish. (5F, 5W, 5S) 
101, 102, 103 Intermediate Spanish. (3F, 3W, 3S) 
105. Advanced Composition and Conversation. (3W) 
106, 107, 108. Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S) 
125. Survey of Spanish Literature. (3S) 

**Greek**

1, 2, 3. Elementary Greek. (5F, 5W, 5S) 

**Latin**

1, 2, 3. Latin. Emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of English. Recommended for English majors and for pre-law and pre-medical students. Includes readings from Caesar. (5F, 5W, 5S) 
101, 102, 103. Vergil and Cicero. Readings from the orations of Cicero and Vergil’s Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3S) 
104, 105, 106. Selective Readings in Latin. (2F, 2W, 2S)
SCHOOL OF HUMANITIES AND SCIENCES

Portuguese

1, 2, 3. Portuguese. Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5F, 5W, 5S) Meyer

101, 102, 103. Second Year of Portuguese. Grammar, reading, conversation and composition. Credit arranged. (F, W, S) Meyer


Russian

1, 2, 3. Russian. (5F, 5W, 5S) Staff

Courses for Foreign Students Taught by the Modern Language Department

M. L. A. English Phonetics for Foreign Students ((3 Cr).
To train foreign students in the sounds of English, and to increase their ability to speak with the rhythm and intonation of American English. May be taken in conjunction with M. L. B.

M. L. B. English for Foreign Students (3 Cr). Meyer

Basic training in the structure of the language, with exercises and drills for increasing comprehension and ability to write accurately. It is 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.

M. L. C. English for Foreign Students (3 cr). A continuation of M. L. B.

Physics

Rolland Perry, Professor and Head of Department; Jay O. Jensen, Assistant Professor.

Requirements for Physics Majors: 45 credits, of which 30 credits must be upper division courses. Certain approved courses in upper division Engineering, not to exceed 10 credits, may be counted.

Suggested courses: The following sequence of courses is recommended for students who wish to continue in graduate study in physics.

Freshman Year: Mathematics 35, 46, 97; Chemistry 3, 4, 5; English 1, 2, 3. Group Electives.

Sophomore Year: Physics 20, 21, 22; Math. 98, 99, 100; German or French. or group electives.

Junior Year: Physics 120, 121, 130, Physics 175, 176, 177; (or Physics 153, 154) Math. 122, 145; Group Electives.

Senior Year: Physics 153, 154 (or Physics 175, 176, 177) 185, 186, 187, 193, 194, 195; one other year course in Physics; Math. 130, 131, 132; Chem. 104, 105, 106. Language group electives.

Minor in Physics is approved only for students majoring in closely related subjects. Such students must complete Physics 20, 21, 22, and at least 9 credits of upper division work. Physics 120, 121 and 130 are recommended for a teaching minor. Required professional education courses for the teaching certificate are listed by the School of Education.

Master of Science Degree in Physics

Candidates for the degree of Master of Science in Physics must present general physics, general chemistry, calculus, one additional year of mathe-
matics and upper division courses in five of the following areas: Mechanics, Heat and Thermodynamics, Geometrical and Physical Optics, Electricity and Magnetism, Modern and Nuclear Physics, Meteorology, Physical Chemistry, Electronics, Sound. If the candidate has fewer than six credits in certain of these five fields, he may be requested to take additional work in those areas as part of the work for the Master's degree.

Courses

3. Introductory Physics. A non-technical course for students who do not expect to major in sciences but who want understanding of fundamental physical principles and their applications. (5F, W or S) Jensen

6, 7. General Physics. Physics 6 covers mechanics, constitution of matter, heat, and meteorology. Physics 7 emphasizes electricity and magnetism, with a survey of light and sound. Primarily designed for students in forestry and Agriculture. (Physics 6, 5 credits F or W; Physics 7, 5 credits S) Jensen

16. Introductory Meteorology. A non-mathematical treatment of physical laws governing the atmosphere and its phenomena. Brief study of the polar-front theory, air-mass analysis, weather map reading, forecasting, and information required by the Civil Aeronautics Administration for flying. (3F) Jensen

17, 18, 19. Mechanics. Electricity and Magnetism. Heat, Sound and Light. For Pre-Medical, Pre-Dental, Agriculture and Technology Majors. Prerequisite: Math. 44 or 46. Should be taken in sophomore year, and in the sequence indicated, except with permission of instructor. Three lectures, two labs. and two quiz periods per week. (5F, 5W, 5S) Jensen

20, 21, 22. Mechanics. Electricity and Magnetism. Heat, Sound and Light. For Science majors and Engineers. Prerequisite: Math. 44 or 46. Concurrent or previous registration for calculus desirable. To be taken in sequence except with permission of instructor. Should be taken in the sophomore year. Three lectures, two labs and two quiz sections per week. (5F, 5W, 5S) Perry; Hart

31, 32, 33. Physical Science. Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics, and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of three quarters' work. (3F, 3W, 3S) Staff

91. Modern Physics for Engineers. (3S) Perry

Upper Division

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken in Junior year.

Physical Chemistry. See Chemistry 104, 105, 106 and Chemistry 109, 110, 111.

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. Prerequisite: Physics 19 or 22 and Calculus. Four lectures, one lab. (5S) Jensen

120, 121. Modern Physics. (Recommended for juniors.) A study of electrons, ions, atomic structure and radiation. (3F, 3W) Perry

130. Nuclear Physics. (To follow Physics 121.) A survey of methods and results of recent investigations of nuclear processes. (3S) Perry

140. Biophysics. Principles of electricity, light, X-rays and radioactivity as related to studies in biology. (5F) Hart
146. Sound. An intermediate course in sound and vibration. Taught 1956-57. (3S) Hart


160, 161, 162. Heat; Thermodynamics; Kinetic Theory. (3F, 3W, 3S) Hart


182. Electronics. Emphasis on design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. Three lectures, one lab. (4 Arr.) Taught 1956-57. Hart


193, 194, 195. Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in physics. Students receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for this course or not. (1F, 1W, 1S) Staff

196, 197, 198. Selected Reading in Physics. (1F, 1W, 1S) Staff

Graduate Courses

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.


250. Research in Physics. Credit to be arranged before registration. (F, W, S) Staff


293, 294, 295. Seminar in Physics. (1F, 1W, 1S) Staff

Upon sufficient demand other courses may be offered.

Speech

Chester J. Myers, Professor and Head of Department; Rex E. Robinson, Professor; Burrell F. Hansen, Associate Professor; Gwendella Thornley, Parley W. Newman, Assistant Professors.

The Department of Speech offers training in interpretation, public address, broadcasting, and speech pathology.
The requirements of forty-five credit hours for a departmental major or a teaching major in Speech are as follows: Public Speaking, 8 credits (Speech 125 required of all majors); Interpretation, 8 credits (Speech 124 required of all majors); Drama 8 credits. F. A. D. 30 and 50 required of all majors; Speech Correction, 5 credits (Speech 167 required of all majors); Radio, 6 credits (Radio Production required of all majors); elective courses in Speech, 10 credits. In addition, courses in Dramatic Literature, 5 credits and Teaching of Speech, 2 credits, are to be recommended by the Department Head according to student needs.

English courses 163, 168 may be used for credit toward the department requirement in dramatic literature.

Students placing emphasis in speech correction and desiring to comply with the minimum standards for certification by the American Speech and Hearing Association, in addition to departmental requirements, must satisfactorily complete the following speech courses: 7, 111, 167, 169, 171, 173, 175, 177, 179. An additional 14 quarter hours in psychology is required including Child Psychology (or Child Development) and Mental Hygiene.

For the Composite English-Speech Major, students are required to have the following speech courses: Public Speaking, 8 credits; Interpretation, 8 credits; Drama, 8 credits; Speech Correction, 5 credits; Radio, 3 credits; Teaching of Speech, 2 credits. For a distribution of these courses see second paragraph above. For English courses needed for the English-Speech composite major see writeup for English Department.

Master of Science Degree

The Department of Speech offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Speech Pathology, interpretation, public address and radio.

The following courses may be used for graduate credit by students majoring in the Speech Department or by students in other departments: 110, 111, 123, 124, 125, 171, 173, 181, 182, 184, 185, 186, 190.

Courses

1. **Public Speaking A.** (Formerly Fundamentals of Speech) Elementary training in Public Speaking. Includes training in daily speaking situations, voice improvement. Clinic assistance available to students who need it. Time for clinical assistance to be arranged. Credit is not given to students who have taken Speech 5. (5F, W or S) Staff

3. **Practice in Speaking.** Designed for students who need practice in public speaking in addition to that of Basic Communications. (3F, W or S)

4. **Principles of Reading.** Effective oral and silent reading of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes both standard literature and everyday reading matter. (5F, W or S) Thornley

5. **Public Speaking B.** Meets specific needs of professional people in the practice of their profession. Basic principles of effective speaking, with emphasis on preparation and delivery of forms and address of greatest interest to those for whom the course is provided. Credit is not given to students who have taken Speech 1. (3F, W or S) Staff

7. **Voice and Phonetics.** This course is designed to analyze speech with regard to the acoustical, anatomical and phonetic components of which it is composed. (3F) Newman

12. **Individual Problems.** Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill,
and solve individual speech problems. Recommended for everyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged.

16. Dialect. The most prominent dialect forms, their principles and uses. The dialect work of such writers as Burns, Kipling, Drummond, Riley, Dunbar, Harris, and Kirk is studied, discussed and learned. Taught alternate years. (3S) Myers

21. Intermediate Public Speaking. (Formerly Advanced Public Speaking) Students work with types of speaking most interesting and useful to them, and determine lengths of speeches and times to speak, within the framework of certain minimum requirements. Emphasis on developing skill in speech presentation. Prerequisite: Speech 1 or Basic Communications 1, 2 and 3. (3F, W or S) Myers

24. Oral Interpretation: Lecture and Recital. Various literary forms are studied for platform presentation. Reading from manuscript and from memory. Preparation and presentation of public recital in reading. (3F) Myers

75. Remedial Speech. For persons who have a noticeable difficulty with speech, in articulation, quality, pitch intensity, or rhythm. Time and credit arranged. Consult instructor before registering. May be taken more than one quarter. Newman

81. Introduction to Radio and Television. Radio and TV station and network organization, operations, and programming. Attention given to developing an understanding of radio and TV as factors in social organization, and to developing appreciation in selection of programs. (3F) Hansen

82. Radio Speech. Analysis and development of speech skills and speech forms used in radio and TV. Development of acceptable standards of voice and articulation for broadcasting. Includes exercises in presentation of announcements, talks, program continuities, interviews and roundtables. (3S) B. Hansen

83. Elements of Broadcasting. The various aspects of broadcast programs with practice in each. Writing and production of commercial continuity, news, musical programs, and dramas are carried out. (3W) Myers

84. Studio and Control Room Operations. Basic studio and control room operations carried out by the announcer in radio stations. Information is basic for radio producers, announcers, and educators who use radio. 1 hour lecture and 2 hours of lab. per week. (2F) B. Hansen

105. Technical and Professional Speaking. Meets specific needs of technically trained and professional people in the practice of their professions. Speaking experiences parallel those encountered in career situations. Prerequisite: Speech 1 or Basic Communications 1, 2 and 3. (3F, W or S) Staff

109. Public Discussion. Application of various group discussions techniques to current problems. Efforts are made to have some discussions presented to various civic and religious organizations, or to release them over a commercial radio station. (3S) Robinson

110. Public Programs. Scene and play reading. Taught alternate years. (3W) Myers

111. The Psychology and Semantics of Speech. Principles of psychology which underlie speech. An insight into the processes of symbol use is attempted to bring about a more effective communication function. (3S) Newman

112. Private Instruction. Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill, and solve individual speech problems. Recommended for everyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged. Staff
113. Argumentation. For the student desiring a background of information and practice in techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. (3F) Robinson

114. Writing for Radio. (3S) (See Journalism Division) Robinson

115. Intercollegiate Debating. Members of debating squads may receive not more than three credits in any one year. (3F, W or S) Robinson


123. Teaching of Speech. (Education 123) —Methods and problems peculiar to the teaching of speech; organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2S) Myers

124. Advanced Interpretation. The mastering of significant selections from great writers. Reading from manuscript and from memory. (5S) Myers

125. Speech Composition. Advanced theory and practice of public speaking. Students build and deliver several short speeches and read selected masterpieces from the world’s public speaking literature. Prerequisite: Sophomore standing, and Speech 1 or 5 (5W) Robinson

167. Introduction to Speech Correction. Factors conducive to normal and abnormal speech development in the child. Special attention to problems of articulation disorders and stuttering. Students receive supervised experience in actual case work. Recommended for prospective elementary school teachers. (5F) Newman

169. Speech Pathology I. Functional and organic voice defects are studied. Cleft palate speech problems are considered. Some attention is given to the acquisition of substitute voice such as esophageal speech. Supervised experience in actual case work. Prerequisite: Speech 167. (5W) Newman

171. Speech Pathology II. Lectures and practicum in speech problems due to lesions of the nervous system such as Cerebral Palsy, Aphasia and dysarthrias. Prerequisite: Sp. 167. (5S) Newman


179. Speech Science. Lectures and readings in pertinent research studies that have contributed to the field of speech. (3W) Newman

181. Radio Production. Study and studio practice in problems in directing and producing various kinds of broadcasts. Planning programs, casting and rehearsal procedures, co-ordination of technical aspects of production, and problems in special studio effects are considered. Registration limited to Juniors and Seniors. (3S) B. Hansen

182. Radio Newscasting and Writing. Gives credit in both Speech and Journalism departments. Principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5W) Stewart; B. Hansen
184. Educational Broadcasting. Study and practice in the preparation and broadcasting of educational programs for children and adults. Designed to acquaint teachers, extension agents, civic workers, and others engaged in public informational activities with the broadcast services. Taught alternate years. (3W) B. Hansen

185. Advanced Radio-TV Production. Follows 181 and deals with more specialized production problems such as remote pick-ups, integration of recorded with live material, network and local studio co-ordination, documentary production, dramatic problems and special events. Prerequisite: Speech 181. B. Hansen

186. Radio and Television Training. Enrollment limited to students qualified by training and ability for actual broadcasting experience in a station. Students so qualified are allowed to register for from 3 to 5 credits. Students serve an apprenticeship under direction of the station staff in executing duties expected of a regular staff employee. Students render three hours service per week broadcasting for each registered hour of credit. (Time and Credit arranged.) (F, W, S) B. Hansen

190. Problems in Speech. Especially selected work, individually assigned, handled and directed in consultation with the student. Special Speech problems of merit and of mutual interest to students and instructors are investigated and reported upon in this course. Consult instructor for permission to register. Any quarter. Credit and time arranged. Staff

Graduate Courses


201. Thesis. Prerequisite: Graduate standing. (2-5F, W or S) Staff

207. Experimental Methods in Audiology. Lecture and laboratory periods in basic concepts of psychophysics and psychophysiology of the ear. Prerequisites: graduate standing and some background in elementary statistics. (3S) Newman

208. Experimental Phonetics. Principles and techniques in scientific analysis of speech and voice. (3W) Newman

290. Research Studies. Advanced research in Speech and Drama. By permission of instructors. Any quarter. Credit arranged. Staff

Zoology

ZOLOGY, ENTOMOLOGY, PHYSIOLOGY


For a major in Zoology the following courses must be taken: Zoology 3, 4, 107, 112, 116 or Entomology 115, 118 or 119; 127 or 128, 131; Entomology 13 and Physiology 121, 122. Also the following courses are recommended: Mathematics 34, 35, 44; Agronomy 131, 132; Chemistry 3, 4, 5, 125, 126; Physics 17, 18, 19; Botany 24, 25; Bacteriology 70, 71; Wildlife 160; Geology 3, 4. For students planning graduate work leading toward the Ph.D. degree, study of foreign languages is recommended.
For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction, School of Humanities and Sciences, must be completed, and in addition the following courses must be taken: Zoology 107, 119, 127 or 128, 129, 131, 116 or Entomology 115.

Master of Science Degree

The Zoology, Entomology, and Physiology Department offers courses leading toward the Master of Science degree in various phases of agricultural entomology, genetics, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

Zoology

1. Principles of Biology. See Biology I under General Studies.

2. General Zoology. A brief survey of the more important groups of animals and the basic principles of greatest importance in Zoology. This course is especially designed to meet the needs of students in Agriculture and Forestry for a basic course in Zoology. Three lectures, two labs. (5F or S) Staff

3. Invertebrate Zoology. An introduction to invertebrate animals, emphasizing basic principles, organization of the major groups, and evolutionary relationships. Three lectures, two labs. (5F or W) Staff

4. Vertebrate Zoology. A study of the vertebrates with emphasis on structure, function, evolutionary relationships and some consideration of natural history. (5W or S) Prerequisite: Zool. 3 or equivalent. Staff

107. History and Literature of Biology. The more important men and ideas in the historical development of biology and the methods of finding references. (4F) Gardner

111. Heredity. Facts and principles of inheritance, with emphasis on application to human beings. It is desirable but not essential that an introductory course in biology, physiology, or botany precede this course. (4S) Linford

112. Principles of Genetics. A technical course in basic principles of heredity and variation. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (5F, W, or S) Gardner

113. Human Genetics. Inheritance of human, physical and mental characteristics and associated problems. Prerequisite: a course in zoology or physiology. (3S) Gardner

116. Parasitology. Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Prerequisite: Zool. 3. Three lectures, two labs. (5S) Bahler

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5W) Hammond

119. Comparative Anatomy. Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5S) Hammond

121. Ornithology. Bird study planned to acquaint students with native birds and the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution are studied in classroom, laboratory, and field. Two lectures, two labs. (4S) Stanford

122. Mammalogy. Introduces students to Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance are stressed. Two lectures, two labs. (4W) Stanford
123. Natural History of Animals. Identification, habits, food, distribution and other features of common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Laboratory time is spent in making observations and collections in the field. Prerequisite: One or more courses in Zoology. Two lectures, two labs. (4F) Stanford

127. Cytology. Study of cells, with emphasis on chromosomes and their behavior. Two lectures, two labs. (4W) Gardner

128. Elements of Histology. Study of tissues, including characteristics of different kinds of tissues and the main organs. Three lectures, two labs. (5F) Bahler

129. Histological Technique. Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3S) Bahler

131. Organic Evolution. Critical study of the facts and theories pertaining to evolution. Prerequisite: One basic course, in biological science. Zool. 111 or 112 recommended. (3W) Gardner

135. Protozoology. A study of local free-living and parasite protozoa and methods of studying them. Prerequisite: Zool. 3. Two labs. (2F) Hammond


201. Special Problems. Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W or S) Staff

214. Advanced Genetics. Intensive study of problems of inheritance, with special consideration given to recent and current research. Prerequisite: Zool. 112. (3S) Gardner

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S) Staff

221, 222, 223 Seminar. Attendance required of all graduate students in department during each quarter in residence. Problems relating to research in general or to current researches in zoological science are discussed by faculty, graduate students, and advanced undergraduates. (1F, 1W, 1S) Staff

Entomology

For a major in Entomology, the following courses are required: Zoology 3, 4, 107, 111 or 112, 131; Entomology 13, 103, 104, 108, 111, 115; Botany 24, 25, 130; Chemistry 3, 4, 5, 125, 126 (or 10, 11, 12); Mathematics 35; Physics 6, 7; Wildlife Management 160. The following courses are recommended: Entomology 120, 138, 230; Agricultural Economics 53; Botany 30; Agronomy 131, 132 and one other course; Horticulture 131 and one other course; Foreign language, two or more courses.

Courses required for a major in Agricultural Entomology: Zoology 3, 4, 112, 131; Entomology 13, 103, 104, 108, 120, 230; Botany 24, 25, 130; Mathematics 35; Chemistry 3, 4, 5, 125, 126 (or 10, 11, 12); Physics 6, 7; Agronomy 118; Agricultural Economics 53, 58; Horticulture 131 and 6 additional credits.


21. Beekeeping. Introduction to principles and practices of beekeeping, how to establish a colony, seasonal management of colonies for honey production and pollination purposes; swarm control, honey harvest, and wintering practices. Two lectures, one lab. (3S) Not offered in 1956-57.
102. Systematic Entomology. Study of the classification of insects to orders. Collection of 400 specimens, 125 species and 15 orders required. Majors in entomology take Entomology 103 instead of this course. Prerequisite: Entomology 13 or 108. Three labs. (S)

103. Morphology and Taxonomy of Insects. A study of the external structures of insects and how they are used in classification. Collection of at least 600 specimens, 200 species, 90 families and 18 orders required. Prerequisite: Entomology 13. Two lectures, two labs and field collecting. (F)

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. (W)

105. Forest Entomology. Principal insects attacking forests and forest products. Some attention is also given principles of biological control. A brief study is made of forest vertebrates with emphasis on insect-eating birds. One lecture, two labs. (F)

106. 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. (S)

111. Anatomy and Physiology of Insects. Comparative study of internal structure with considerable attention given to function. Prerequisite: Ent. 103. Two lectures, 2 labs. (W)

115. Medical and Veterinary Entomology. Arthropods are studied that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease receive major attention. Prerequisite: Ent. 13 or equivalent. Two lectures, two labs. (W)

120. Insect Pollination in Relation to Agriculture. The role of 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. Taught alternate years. (W) Offered 1956-57.

138. Aquatic Entomology. Identification, distribution, life histories and adaptations of aquatic insects are studied with particular reference to local streams and lakes. Two lectures, one lab. (S)

150. Research and Thesis. For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Credit arranged. (F, W, S)
Physiology

For a major in Physiology the following courses must be taken: Physiology 4, 121, 122, 123; Biology 1, Zoology 107, 112, 118, 128, 129 and 131; Biochemistry 191. Also Mathematics 34, 35 and 44; Physics 17, 18, 19; Chemistry 3, 4, 5, 17, 18 or 115, 125, 126; Bacteriology 70, 71; and at least one year of a foreign language are recommended.

4. General 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. (5F, W or S) Staff

20. Human Anatomy. Structure of the main human body systems with emphasis on the muscular, skeletal and nervous systems. For students desiring a more thorough study of human anatomy than is given in Physiology 4. Prerequisite: Physiology 4. Two lectures, one lab. (3F) Linford

121, 122. Mammalian Physiology. An intensive and detailed two-quarter course in physiology in which the function of each of the organ systems of man and animals is studied. Students may not register for 122 without having had 121. As preparation, Physiol. 4, Zool. 2, 3, or 4, or Vet. Sci. 20, and courses in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) Staff

123. Endocrinology. The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiol. 4 or Biol. 1 or Zool. 2, 3, or 4, or Vet. Sc. 20 are recommended. (3S) Staff

131. Comparative Physiology. A comparative study of the physiological functions, primarily of the vertebrates. Prerequisite: Physiology 4. Two lectures, one lab. (3S) Staff

200. Special Problems. Special investigations in physiology are carried out in this laboratory course. Open to students who have taken Physiol. 121, 122 or who have been granted special permission. (2-5F, W or S) Staff

241. Methods of Endocrine Research. Methods used in studying the endocrine glands. Prerequisite: Physiol. 123. (3F) Staff

260. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. Staff
# MILITARY SCIENCE AND TACTICS

and

# AIR SCIENCE

**PROF. L. MARK NEUBERGER**  
Civilian ROTC Coordinator

**COLONEL HOWARD A. MOODY**  
Professor of Air Science

**COLONEL ASA C. BLACK**  
Professor of Military Science and Tactics

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General Information

Utah State Agricultural College is one of the Land-Grant colleges established in the United States under the Morrill Act of 1862. Therefore, all qualified male students are required to complete at least two years ROTC training. Students who are physically disqualified for military service, veterans, and students who transfer to Utah State Agricultural College and hold junior or senior class rank may be exempt from this requirement.

Two separate ROTC units are located on the campus. Students may choose which unit they desire to enter to fulfill their ROTC requirements. Young men having an interest in aviation and a desire to fly are encouraged to enter the Air Force ROTC program. Those whose interests lie with the Army should enroll in the Army ROTC course. Both programs provide excellent opportunity for development of leadership ability, however, course material differs greatly. Although students may initially choose which program they wish to enter, subsequent transfer between units is not generally approved because of the difference in material taught.

Both the Army and Air Force ROTC consist of two phases. The basic phase is normally taken during a student’s freshman and sophomore years, and is a requirement for graduation of all qualified lower division male students. It consists of six quarters of work, including drill periods during fall and spring quarters. Unless exempt from this training, as mentioned above, a student must obtain a passing grade for each quarter of work in order to become eligible for graduation. (See summary of requirements for graduation in the front of the catalog.)

The advanced phase of the ROTC course is normally taken during the junior and senior years and consists of another six quarters of work plus a summer camp (to be taken between the junior and senior years). The advanced phase is both elective and selective. It is not a requirement for graduation, but once begun becomes a requirement unless a proper release is obtained. Students are selected for enrollment in the advanced phase by boards composed of military and civilian faculty members. Selection is based on academic standing, leadership ability, officer potential and interest in the military. Satisfactory completion of the basic phase is normally a prerequisite for entrance into the advanced phase.

Satisfactory completion of both the basic and advanced phase, including the summer camp, leads to a commission as second lieutenant in the Army or Air Force Reserve, according to which program is followed. Outstanding students in both programs are afforded the opportunity of applying for commissions in the regular service.

Deferment from the draft is offered to all students who maintain satisfactory grades in their academic subjects and in ROTC. Upon completing the program, and being commissioned, students normally enter on active duty with the Armed Forces as second lieutenants in the service in which they were commissioned. The period of active service required of ROTC graduates depends on the requirements of the service concerned, as explained in the sections below.

Enrollment Regulations

Two years, or six credit hours, of Army or Air Force ROTC is required for graduation of all qualified male students. Exemptions from ROTC training (i.e. evidence of veteran status, physical disqualifications, etc.) must be presented at time of registration. Students who are required to complete the basic ROTC course must repeat failed work until a passing grade is received. Responsibility for completion of this requirement rests with the student. A student who fails to register or appear for ROTC classes, may, at the discretion of the President, be excluded from all classes.
The advanced ROTC course is elective, but once begun becomes a requirement for graduation unless a proper release is obtained. Only students selected by the respective ROTC units may enroll in the advanced phase. Enrollment is not normally allowed until after satisfactory completion of the basic phase of the program.

ROTC drill periods are an integral part of the ROTC program. Registration for one of the drill periods offered is required of all ROTC students. ROTC Band students drill separately under the supervision of the college director of bands.

A combination uniform deposit and laboratory fee is required of all ROTC students. An amount of $5.00 is paid at the time of initial enrollment each year. Of this sum, a portion is returned to the student at the end of Spring Quarter or when the student drops from school.

GENERAL REQUIREMENTS FOR ENROLLMENT

A. Basic phase:
1. Be a citizen of the United States.
2. Not less than 14 years of age.
3. Physically qualified for military service.

B. Advanced Phase:
1. Satisfactorily complete the basic phase, or have equivalent credit.
2. Have high moral character. (Convictions by a civil or military court, other than minor traffic violations, must be waived before formal enrollment is accepted.)
3. Be able to complete the program and qualify for appointment as a Second Lieutenant before reaching their 28th birthday.
4. Accept and sign a draft deferment agreement and agree to the stipulations of the Advanced Course Contract. (A contract outlining the obligations of both the student and the service.)
5. Obtain a satisfactory score in the Air Force Officer Qualification Test battery or Army Qualification Test for Army ROTC. (The tests are usually administered to sophomore students during Fall and Winter Quarter.)
6. Be selected for enrollment into the advanced phase by a selection board composed of officers and civilian faculty members. (Selection is based on academic standing, previous military or air science grades, score in the tests, moral character, leadership and officer potential.)
7. Have at least two years of college remaining before becoming eligible for a degree. (It is desired that all students complete the ROTC course and the requirements for a degree simultaneously.)
8. Transfer membership in any reserve organization of the Armed Forces to the respective ROTC service. (Staff personnel of the department will assist students as necessary.)

Air Force ROTC

Howard A. Moody, Colonel, Professor of Air Science. Assistant Professors of Air Science: Major Robert Angus, Major Chester G. Krieger, Captain Eldon B. Hooper, Captain Ansel O. Singleton.

The mission and purpose of the Air Force ROTC program is to prepare young men to serve as officers in the Reserve and Regular components of the Air Force. Designed to supplement college training, the Air Force ROTC
course develops the attributes of character, leadership and personality essential to every Air Force officer and citizen of the United States. It is not the purpose of the course to train students in specific fields, but rather to give them a general understanding of the mission of the Air Force, its organization, problems and techniques. In addition, the academic phase of the course develops a background in national and international affairs to aid students to intelligently interpret and evaluate world events.

Since the Air Force is primarily engaged in providing the Air Power for our armed forces, most of the students who complete the AFROTC program and commissioned in the Air Force are required to take flight training after going on active duty. The types of flight training usually expected of graduates are either pilot or navigator-observer. Both courses take approximately one year to complete. During this training, students receive the pay of a Second Lieutenant (approximately $5590.00 per year). Upon completion of training, students serve two years on active duty with the Air Force. Students not qualified for flight training may be enrolled in the advanced AFROTC provided they qualify in certain specialized fields, such as Electronics, Meteorology, Engineering and Nuclear Physics. A small number of outstanding students may be accepted into the advanced course each year who are neither qualified for flight training nor for the specialized program mentioned above. Students who are classified as veterans under the Universal Military Training Act may enroll in the advanced course without regard to qualification for flight or specialized training. All students commissioned in the Air Force Reserve, except veterans, are required to serve a total of three years on active duty.

Structure of the AFROTC Course. The course is divided into two phases; the basic and the advanced. The basic phase is usually taken during a student's freshman and sophomore years. The advanced is normally taken during the junior and senior years and has, in addition to the normal school work, a summer training period of four weeks. The summer training is taken during the summer between the junior and senior years at an Air Force installation. Students are paid for the cost of travel to and from camp and are paid regular service pay while attending the camp.

Quotas. There is no quota or restriction for enrollment into the basic phase. A production quota is established yearly by Air Force Headquarters for enrollment in the advanced phase. The quota is based on the estimated needs of the Air Force for officers of various skills and stipulates the number that can be commissioned each year.

Summer Camp. A four-week summer training period is a required part of the advanced phase. Generally two training periods are offered each summer. Students may choose which camp they desire to attend, however, the summer training must be taken between the junior and senior years. These camps are held at various Air Force bases throughout the country. Students are usually scheduled to attend the camp nearest their home. Most students living in Utah and Idaho attend camps in California, Arizona, Nevada or Washington.

Veterans. Veterans are accepted into the AFROTC program without regard to quota spaces. Those veterans who complete the program are commissioned Second Lieutenants in the Air Force Reserve but are not required to serve on active duty. Parts of the basic phase of the program may be waived for military service, however, no portion of the basic phase will be waived which the veteran could take prior to becoming eligible for entrance into the advanced phase.

High School ROTC. Because of the difference between the Army and Air Force ROTC programs, no credit in AFROTC is given students who have taken high school ROTC.

Payment to Advanced Students. Students enrolled in the advanced course are paid a "Subsistence Allowance" amounting to approximately
$27.00 per month. These payments normally continue from the time of enrollment until completion of the course and include normal vacation periods. While at summer camp no subsistence is paid, but students receive pay at the rate prescribed for basic airmen plus travel pay to and from camp.

**Flight Training.** Flight training is taken after entry on active duty. When a student is selected for entrance into the advanced program, he is selected for one of four general categories, i.e. Flying, Special Training, General, or Veteran. Those selected for flying must maintain their qualification for such training. They must submit an application for such training soon after beginning their senior year. At the time they graduate from college, they are commissioned in the Air Force Reserve and are called to active duty in the Air Force during the next year. Upon going on active duty, the student immediately enters flying school.

**Delay of Entry on Active Duty.** Students who complete the AFROTC program and receive their commissions may request a delay in being called to active duty if they desire to continue their studies in certain fields. Such delays are for six months and may be renewed each six months until studies are completed. Students who are slated for flight training, however, must enter such training before reaching their 27th birthday. (Students who turn 27 while enrolled in the AFROTC program must enter flight training before reaching their 28th birthday.)

**Texts and Uniforms.** All texts and uniforms are furnished at no expense to the student, other than a combination deposit and laboratory fee of $5.00. Of this fee, $3.00, less the cost of laundry and dry cleaning the uniform and the cost of lost equipment, is returned to the student at the end of the school year or when he drops from the program.

**Air Force Chaplains.** Students who meet special requirements may be commissioned as Chaplains in the Air Force. Selection of these individuals rests with the Chief of Chaplains, United States Air Force, Washington, D.C. Interested persons are urged to contact members of the AFROTC staff for further information.

### Army ROTC

Asa C. Black, Colonel, Professor of Military Science and Tactics. Assistant Professors of Military Science and Tactics: Charles F. McCormick, Jr., Major, QMC; Lewis A. Civille, Major, Inf.; Charles R. Clark, Capt., Engr.; Assistant Instructors: Donald K. Bartholomew, M. Sgt.; Harvey J. Holcomb, M. Sgt.; George N. LaFleur, SFC.

The mission and purpose of the Army ROTC program is to prepare young men to serve as officers in the reserve and regular components of the army. A General Military Science Program is offered with instruction given in common subjects to provide general background knowledge essential in all branches of the service. Military leadership and citizenship is emphasized. Upon successful completion of the advanced course, cadets receive a commission as a Second Lieutenant in one of the arms or services of the Army. The academic field of study and the needs of the service generally determine the branch assignment.

**Summer Camp.** A six weeks summer camp is held at Fort Lewis, Washington, for first year advanced students. Practical application of classroom theory and living in the field make it an interesting and stimulating experience. Students receive pay for time spent at camp and for travel to and from camp.

**Veterans.** Veterans are accepted into the Army ROTC advanced program provided they can qualify as outlined in preceding regulations. All or part of the basic program may be waived depending upon length of service.
of the individual. Present Department of the Army policy provides that veterans may serve a period of active duty service.

High School ROTC. Credit for Junior Division ROTC is allowed upon presentation of a Military Training Certificate indicating full completion of the three-year high school program. The three-year high school program is considered equivalent to the first year basic course, Senior Division. Enrollment in second year basic course is usually authorized only when the student attains sophomore standing.

Quotas. There is no quota or restriction for enrollment in the basic course. At present there is no limiting quota for entrance into the Army ROTC advanced program.

Payment to Advanced Students. Students enrolled in the advanced course are paid a “Subsistence Allowance” amounting to approximately $27.00 per month. These payments normally continue from time of enrollment until completion of the course and include normal vacation periods. (Only one summer vacation period may be paid for.) While at summer camp, however, no subsistence is paid, but students receive pay at the rate prescribed for basic private plus travel pay to and from camp.

Service Schools. The first duty assignment after being commissioned is to a service school. These schools are located throughout the U. S. and are normally 12 weeks in duration. Specialized instruction is given to prepare the Second Lieutenant in his assigned branch of service.

Delay of Entry on Active Duty: Students who complete the Army ROTC program and are commissioned may delay entry upon active duty, if they wish, to continue their studies in certain fields. Information regarding specific fields of study and procedure may be obtained upon request.

Texts and Uniforms. All texts and uniforms are furnished at no expense to the student other than a combination deposit and laboratory fee of $5.00. Of this fee, $3.00, less the cost of laundry and dry cleaning the uniform and the cost of lost equipment, is returned to the student at the end of the school year or when he drops from the program.

AIR SCIENCE COURSES

Two hours drill are required each week during the fall and spring course.

AIR SCIENCE I—FIRST YEAR BASIC—AIR FORCE

11. Air Science. Introduces student to Air Force ROTC course, to USAC cadet program and to regulations which govern cadets. Reason for ROTC program and obligations of service are explained. Major part of quarter is devoted to history of flight beginning with man's earliest attempts to fly. Theory of flight is taught in latter part of quarter. (Drill required) (1F)

12. Air Science. Fundamentals of Global Geography. The major geographical regions of the earth, map projections, geography of the world as influenced by the airplane, are first studied. The power of a nation to defend itself and to support a war effort, based on its geographical position and resource strength. Then attention is given to the reasons for war, the solutions mankind has tried, their successes and failures, in attempting to eliminate war. The tensions which build up between nations, their causes and results. The basic structure of the United Nations and various other security organizations is taught in this quarter. (1W)

13. Air Science. Historical development, mission, weapons and joint operations of Armed Forces; the place of air power in modern war, the functions and use of aircraft in modern war, and in combination with other branches of the service. The future of military aviation in the United States. (Drill required) (1S)
AIR SCIENCE II—SECOND YEAR BASIC—AIR FORCE

21. Air Science. Introduction to Elements of Aeriel Warfare. Study of targets including definition and types and related intelligence procedures. Study of weapons, including conventional high explosives, atomic, rocket-propulsion, chemical, biological and psychological. (1F)

22. Air Science. Study of delivery aircraft dealing with factors governing design and type of delivery aircraft and purpose for which designed. Study of the air base as a platform for the delivery of weapons. (1W)

23. Air Science. Study of operations including types of combat air operations such as strategic, theater, air transport, and air defense. This study preceded by background material on United States Air policy. (1S)

AIR SCIENCE III—FIRST YEAR ADVANCED—AIR FORCE

131. Air Science. Introduction to advanced AFROTC, the functioning of the Air Force during the first 15 hours. The remaining 25 hours of the quarter are (writing, speaking, reading, listening) techniques, and Air Force instructional methods are the content of this course. (3F)

132. Air Science. Legal procedures and the military justice system in the Air Force during the first 15 hours. The remaining 25 hours of the quarter are used in study of problem solving techniques. (3W)

133. Air Science. Aerial navigation (including map reading and use of navigational computers), weather prediction and weather map interpretation, and the actual functions of a typical Air Force Base and the functions of the key officers on a base are presented. (3S)

150. Air Science, Summer Camp. The Air Force ROTC summer camp consists of four weeks of practical training at an established AF Base. It is conducted by regular Air Force officers and offers the cadet training with latest equipment used by the Air Force. Flight orientation phase is emphasized.

Unless exempt, the cadet attends the camp the next summer following the signing of his contract. Exemptions are authorized only for students who are required to attend other summer schools or camps, such as Forestry or otherwise. In this case, the student is required to attend Air Force camp the following summer.

AIR SCIENCE IV—SECOND YEAR ADVANCED—AIR FORCE

141. Air Science. Summer camp critique, principles of leadership and management, authority of command, responsibilities of leadership and problems of leadership and career guidance are taught during this quarter. (3F)

142. Air Science. This course covers military aspects of world political geography and geopolitical concept, international politics, structure of politics, structure of political power, world powers and strategic areas, changing patterns of power in world politics, and problems in world security in relation to international power clashes. (3W)

143. Air Science. This course covers military aviation, evolution of warfare to include principles of war, modern warfare as carried out by land, naval and air arms. The students are briefed for commissioned service to include active duty assignments and the long range reserve plan. (3S)

Army

Basic Courses (MS I and MS II)

11. Military Science I. Organization of the Army and ROTC; Individual Weapons and Marksmanship; School of the Soldier and Exercise of Command. (1F)
12. Military Science I. Individual Weapons and Marksmanship; American Military History. (1W) Staff
13. Military Science I. American Military History; School of the Soldier and Exercise of Command. (1S) Staff
21. Military Science II. Map Reading; School of the Soldier and Exercise of Command. (1F) Clark
22. Military Science II. Aerial Photograph Reading; Crew Served Weapons and Gunnery. (1W) Clark
23. Military Science II. Crew Served Weapons and Gunnery; School of the Soldier and Exercise of Command. (1S) Clark

Advanced Courses (MS III and MS IV)

131. Military Science III. Leadership; Military Teaching Methods; Organization, Function, and Mission of the Arms and Services; School of the Soldier and Exercise of Command. (3F) Staff
132. Military Science III. Organization, Function, and Mission of the Arms and Services; Small Unit Tactics. (3W) Staff
133. Military Science III. Small Unit Tactics; School of the Soldier and Exercise of Command. (3S) Staff
141. Military Science IV. Operations; School of the Soldier and Exercise of Command. (3F) McCormick
143. Military Science IV. Military Administration, Service Orientation, School of the Soldier and Exercise of Command. (3S) McCormick
150. Military Science Summer Camp. Six weeks practical training at a regular army post. Attendance at summer camp is required of all advanced military science students. Students attend during the summer following completion of Military Science III.
174. Advanced Military Science Seminar Problems. Prerequisite: Enrollment in or completion of Advanced Military Science. Credits arranged. Staff
201. Advanced Military Science Seminar Problems. Prerequisite: Graduate standing. Credits arranged. Staff

JOINT ARMY-AIR FORCE COURSES OR ACTIVITIES

Sponsor Corps: A semi-military organization composed of 75 coeds elected to the Corps by popular vote of the Army and Air Force Advanced Cadets. Only freshmen and transfer students who are freshman or first quarter sophomores may apply to fill annual vacancies.

ROTC Band: A military band under the direction of the College Band Instructor but governed by the policies of the Departments of Military and Air Science. Students selected for the band will enroll for Military or Air Science classroom work but drill only 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 Department and to maintain a highly efficient drill company.” Company “D,” 6th Regiment is located at U.S.A.C. Pershing Rifles has an Army Platoon and an Air Force Flight and is open to any basic or advanced cadet as long as the number does not exceed 60 basics and 7 advanced students.

Rifle Team: Established to promote marksmanship among Army and Air Force Cadets. Team competes in several regional and national invitational tournaments.
ROTC Band Courses

1B, 2B, 3B. ROTC. First Year (1F, 1W, 1S)
4B, 5B, 6B. ROTC Band. Second Year (1F, 1W, 1S)

Sponsor Corps Courses

51, 52, 53. Military Science Sponsor Drill. A Drill course for girls elected to Corps of Sponsors. (1F, 1W, 1S)
54, 55, 56. Military Science Sponsors Drill. (Sophomore) (1F, 1W, 1S)
151, 152, 153. Military Science Sponsor Drill. (Junior) (1F, 1W, 1S)
154, 155, 156. Military Science Sponsor Drill. (Senior) (1F, 1W, 1S)

Pershing Rifles

37, 38, 39. Pershing Rifle Drill—Freshmen. (1F, 1W, 1S)
40, 41, 42. Pershing Rifle Drill—Sophomores. (1F, 1W, 1S)
137, 138, 139. Pershing Rifle Drill—Advanced Cadet Staff (1F, 1W, 1S)
The Agricultural Experiment Station, established in 1889, is a major division of the College. It is responsible for conducting research in Utah under federal and state legislation. Its primary objective is to conduct experiments and scientific researches that have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and the development and improvement of the rural home and rural life. Results of this research are published in bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The Agricultural Experiment Station staff numbers approximately 125. Many of them are also members of the teaching faculty of the College. Some of them also divide their time with the Agricultural Extension Service of the College. In addition, several employees of the U.S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

Main offices of the Agricultural Experiment Station are on the College campus in the new agricultural science building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed among the various College buildings.

Greenhouses are maintained for investigations in horticulture, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the College of Southern Utah, at Snow College milking parlor at Ephraim, at the U.S. Forest Service Desert Range Station, at the Benmore Experimental Range in Tooele County, and on the ranges in different parts of the state.

The Station also maintains the following experimental farms:

Dairy Experimental Farm, including 183 acres of land, barns, milking parlor and a house. The Station maintains an experimental Holstein-Friesian and Jersey dairy herd of about 100 pure-bred animals. Pasture investigations are conducted here.

Greenville Farm, a 36-acre tract, is used for experimental work in plant breeding and other phases of crop production.

Farmington Field Station at North Farmington is a 61-acre tract used for experimental work in horticulture and vegetable crops.

Nephi Farm is used for experimental work in dry farming and range seeding. This farm has 103 acres.

Evans Farm, a 42-acre tract located south of Logan, is used in cooperation with the U.S. Department of Agriculture, for a study of improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

Howell Field Station for Horticulture Research, located in Weber County north of Ogden, is a 71-acre tract used for investigations in fruit production.

Poultry Experimental Farm, a new farm in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.

Turkey Experimental Farm is a new 33-acre farm east of the Campus used for studies in turkey breeding, nutrition, and disease control.

Animal Husbandry Farm north of the campus contains 287 acres of land used for barns and pasture and production of crops for feed.

A summer range area of 2820 acres in the mountains east of Cedar City is used to graze the experimental sheep.

Benmore area of 3500 acres of reseeded range pasture is used in cooperation with the U.S. Department of Agriculture for studies in management of range cattle and for research in range management.
The Station also owns farm plots near the College and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these are soil surveys; plant disease surveys; problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of social problems connected with rural living; gathering of snow survey data; problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and, third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.


Engineering Experiment Station
J. E. CHRISTIANSEN, Director
See “Engineering Experiment Station” under School of Engineering.

Extension Service
CARL FRISCHKNECHT, Director

Farm income is expressed in terms of cash, good food, comfortable homes, and pleasant surroundings. Farm ownership and close contact with nature develop virtues in farm families that result in the highest type of citizens.

The main objective of the Extension Service is to aid rural people in improving farm income and in developing useful, satisfactory lives. Its educational programs are designed to help people to help themselves. Rural leadership is developed by encouraging groups of people to analyze their own problems. A plan to solve these problems becomes the Extension program of work, jointly determined by Extension workers and local people.

Extension programs conducted with and for the people usually result in increased production per acre and per animal unit, more efficient marketing, conservation of soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work which gives boys and girls more appreciation for the farm and home and better understanding of national and world affairs.

The Extension Service is one of the three main divisions of the College and the educational arm of the U. S. Department of Agriculture. Its agricultural and home demonstration agents serve in every county. Cooperating with the agents is a state staff of specialists in agricultural economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, cattle marketing, 4-H Club work, clothing consumer education, education, dairy manufacturing, entomology, home furnishings, home management, horticulture, irrigation, marketing, nutrition, poultry, recreation, rural sociology, and soil conservation. These specialists work out from the College in all portions of the state.

To help train rural leaders, the Extension Service conducts free, non-credit short courses in various agricultural and home economics subjects at the College and at other locations throughout the state.
The Smith-Lever Act of 1914, which established the Extension Service as a unit of each Land-Grant college, specified that the job of Extension was "to give instruction and practical demonstrations to rural people and to the industrial classes to the end that rural life and welfare would be improved."

Extension is a two-way organization. It takes (1) the findings of research to the people of the state and, (2) it brings the problems affecting the welfare of the people back to the research agencies for solution.

DIVISION OF OFF-CAMPUS CLASSES AND HOME STUDY

L. G. NOBLE, Director

"The State is Our Campus"

The Division of Off Campus Classes and Home Study is fully accredited by the National University Extension Association.

Off-Campus Classes. Off-Campus Classes are offered in many subjects throughout resident centers in the State. In-service helps to teachers are available in every department, including classes for the renewal of teaching certificates. Classes are available in vocational subjects and for special-study groups.

All credit obtained through the Division of Off-Campus Classwork is classified as off-campus credit and meets all requirements for graduation except the "15 hours of on-campus" rule.

Off-Campus classes for graduate students are given with special permission of the Graduate School.

Credit for Travel: The Division of Off-Campus Instruction, for the school year 1956-57, is conducting three travel tours for credit—one to Europe, one to South America, and one to Mexico. A student may earn up to one quarter hour per week while taking such a tour. For further information contact the Department of Off-Campus Instruction, Utah State Agricultural College, Logan, Utah.

Regulations for Off-Campus Class Work for Credit

All instructors in off-campus courses are either members of the regular teaching faculty officially assigned to the teaching project concerned, or non-resident members appointed under the procedure customary for faculty appointment in the Institution.

Off-campus credit courses given by direct class instruction shall:

(a) be equivalent in content, hours of class instruction and preparation, to similar courses offered in residence work.

(b) be subject to the same prerequisites as comparable campus courses, or as the departments may prescribe, including a comprehensive final examination.

FEES FOR OFF-CAMPUS INSTRUCTION

HOME STUDY. Home study furnishes an excellent opportunity for systematic instruction to students of high school or college grade and to all adults who desire to obtain information in selected fields.

Students should be at least 19 years of age, or must submit 15 units of high school work, or must be graduates of a high school for admission to Home study courses of college grade. One-fourth of the credits necessary for a degree (45) may be earned through this department.

All home study courses must include a final examination.
Students registered for home study must count this study as part of their total load in case of registration for residence work at the College. If the home study or the residence registration exceeds the maximum amount permitted by the Institution, then the student must obtain the permission of the Attendance and Scholarship Committee to carry this excess load.

Each school of the College, subject to faculty approval, shall determine the nature and the amount of home study credit accepted for admission and toward graduation. In no case shall more than 25 percent of the total number of credit hours accepted for graduation be home study credit.

(For other regulations concerning off-campus credits, see section on "Graduation" in introduction of this catalog.)

Evening School Program
L. G. NOBLE, Director

The Evening School program is a varied program of both general education and practical training for adults in all walks of life.

Evening School
1. To provide evening classes for busy people who cannot attend regular day school.
2. To provide practical training in the various occupational fields for people who need to prepare for jobs, or who need further training in their present field of work.
3. To provide classes in general and cultural education for general self-improvement.
4. To provide classes in related instruction for apprentices and other learners.
5. To provide opportunity for people seeking a college degree to take evening classes for college credit without having to discontinue their regular work to go to school.
6. To provide classes in special-interest fields for people interested in a special field of work.
7. To enable regular college students to take evening classes when desirable.

The Program

Classes in the Evening School are offered by many of the departments in the various schools of the college. They are taught by the regular college professors and by specialists in the field.

Many of the classes carry college credit which can be earned by meeting the standard requirements for credit.

Other classes are for training purposes and not academic credit. These carry "T" credit, or training credit, which prepares for a job but does not lead toward a degree.

Evening School is held on four evenings a week, Monday, Tuesday, Wednesday and Thursday from 7 to 10 p.m.

Specific classes are scheduled for two evenings a week, some on Monday and Wednesday, and others on Tuesday and Thursday. This makes it possible for a person to attend Evening School two or four evenings a week as he may choose.

Classes are held on a clock hour schedule. Classroom classes are an hour and a half, and laboratory or shop classes are three hours in length.
Special courses are provided for those who desire to specialize quickly in certain occupational fields.

Admission

Evening School is open to all adults who can profit by it, regardless of previous education.

Students who intend to work for college credit toward a degree are required to meet the college entrance requirements and maintain acceptable scholastic standards in their work.

Veterans may enter the Evening School under the G. I. Bill.

The School Year

Evening School is held during all the four quarters of the school year. Each quarter covers from ten to twelve weeks.

In the College division a wide variety of subjects is offered in the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, including Poultry and Dairying, Art, Bacteriology, Business Administration and Accounting, Economics, Education, English, Entomology, Home Economics, History, Horticulture, Irrigation and Drainage, Mathematics, Political Science, Psychology, Public Health and Zoology.

Preparatory or high school courses are offered for those who have been unable to complete their high school courses and who wish to satisfy the entrance requirements of the College and also for those who wish to fit themselves for careers in which the equivalent of a high school education is necessary.

$5 per credit hour as of July 1, 1956 Fees.

Graduation Deadline: Seniors who plan to apply home study credits toward graduation must have their course completed by May 1, in order that lessons and examination may be corrected and credit on file in the Registrar’s Office two weeks prior to the day of graduation.

High School Fees: The enrollment for a high school course is $15 for one unit of credit or $8.50 for one-half unit credit. No courses will be accepted for graduation unless started at least by March 1. All work must be completed one month before credit is needed.

U.S.A.F.I. Courses: The Extension Division is cooperating with the Armed Forces Institute at Madison, Wisconsin, to provide U.S.A.C. Home Study courses at a reduced cost to men and women who are on active service in the Army, Navy, Air Force, Marine Corps, or Coast Guard. Members of the armed forces who wish to enroll for such courses should contact education and information center at the base where you are located. If you need further information you may write directly to Home Study Bureau, Utah State Agricultural College, Logan, Utah.

Veterans: The Utah State Agricultural College is approved by the Veterans Administration to offer Home Study courses under the G. I. Bill of Rights (P. L. 346, P. L. 16 and P. L. 550).

All veterans should first contact their local Veterans Administration Regional Office and find out whether or not they are still eligible to continue their schooling under the G. I. benefits, and if so what procedures they must follow to do so.
Registration

Registration for Evening School is done through the Registrar's office, located in the Old Main.

Students must register on the special registration day set at the beginning of each quarter. Send for quarterly bulletin for dates.

Fees

Fees for Off-Campus Instruction

$6 per credit hour effective July 1, 1956.

Fees for Home Study

$5 per credit hour. High school courses: $15 per unit and $8.50 per half unit.

Fees for Evening School

Regular classes: $10 registration fee plus $3 per credit hour up to 9 hours. Above 9 hours regular fees will be charged.

Note: After registration has been completed, the registration fee will not be refunded unless the course is discontinued.

Fees for “T” Classes

“T” credit three-hour lab classes that are held three hours twice a week for a total of six hours per week will pay a registration fee of $15.

Welding and woodwork classes will pay a laboratory fee of $5 in addition to $15 registration fee.
For more than 30 years the College has conducted Summer School. Since 1924, the offering has been materially enlarged and enriched. Among the purposes of this large educational undertaking is to bring to Logan a number of the leading educators of the nation, and to build, in the Intermountain West, a summer school of wide influence.

The equivalent of a quarter's work is offered in the two terms of six and four weeks respectively.

During the Summer School, all departments of the College offer courses. The program is arranged to meet the special needs of summer students. Courses offered in Education, Psychology, and related departments make it possible for students to meet all requirements for Utah certification. This curriculum also meets requirements for certification in most of the surrounding states.

In past years the majority of summer students have been teachers and administrators in secondary and elementary schools. At present an increasing number of regular students is continuing through the summer. High school graduates are also entering the college immediately rather than postponing entrance until Fall Quarter. Former military personnel who are receiving government aid are especially interested in a regular summer program inasmuch as nearly all of them wish to complete their education as quickly as possible. The summer curriculum is arranged to meet this trend. Consequently, practically all departments are offering much of their regular program in the Summer Quarter.

Numerous lectures, lyceum numbers in music and drama, and other recreational opportunities are regularly scheduled as part of the summer school offering.

GRADUATE CREDIT

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science or the Master of Education degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to obtain this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved by the time of registration.

The Summer School catalog containing detailed announcements of courses is issued annually in March and is available upon request.

COLLEGE OF SOUTHERN UTAH

DARYL CHASE, President

ROYDEN BRAITHWAITE, Director

College of Southern Utah, founded in 1897, was first called the Branch Normal School of the University of Utah. With the growing need in southern Utah for agricultural development, a change of administration at the parent institution was effected in 1913 and the school then became a branch of Utah State Agricultural College. The branch was authorized under supervision of the Board of Trustees to offer such courses as are "permitted by law to be given in the Utah State Agricultural College." Through new offerings in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education, young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all CSU courses parallel those of the parent institution.
Eleven men have served as heads of the branch since its founding. The first four were known as principals and held office as follows while the school was a part of the University of Utah: Milton Bennion 1897-1900; J. Reuben Clark 1900-1901; Nathan T. Porter 1901-1903; George W. Decker 1904-1913. The remaining six men have been titled Directors since the institution became a branch of Utah State Agricultural College. They are Roy F. Homer 1913-1921; P. V. Cardon 1921-1922; J. Howard Maughan 1922-1929; Henry Oberhansley 1929-1945; H. Wayne Driggs 1945-1951; Daryl Chase 1951-1954. Dr. Royden Braithwaite was named Director in January, 1955.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Upper Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

In 1948-49 courses for the training of elementary teachers to the Bachelor's Degree were authorized by the Board of Trustees.

The first regular summer school of the College was held in 1949.

In 1953 the Board of Trustees authorized that the name of the branch be changed from Branch Agricultural College to College of Southern Utah.

The Extension Service and the Agricultural Experiment Station are closely connected with CSU. Certain members of the resident staff at Cedar City are also members of the staffs of these two divisions. Deans of the parent institution supervise closely the work of the corresponding divisions at the branch, and course offerings closely parallel those offered on the Logan campus.

SNOW COLLEGE

DARYL CHASE, President

LESTER B. WHETTEN, Director

Sanpete Stake Academy, founded in 1888 at Ephraim by the Church of Jesus Christ of Latter-day Saints was first a preparatory and intermediate school. High School work was added in 1895. After normal studies were added as a fifth year in 1912, the institution became known as Snow Normal College.

It became a junior college in 1922 and since then has been called Snow College.

It was made a state junior college in 1932, and became a four-year junior college in 1937. The college became a branch of Utah State Agricultural College July 1, 1951. It initiated a Vocational Agricultural Program in 1943.

The College Plant includes: (1) The main campus, on which are the Administration Building, the Science Building, the Mechanic Arts Building, Gymnasium, Cafeteria, Auditorium, and outdoor recreational facilities.

(2) The athletic field is an eight-acre tract, contributed by faculty and student body, and is equipped for football, track, and other field events.

(3) The college farm, consisting of 60 acres of improved land has ample housing for farm stock, machinery, and storage facilities for feeding supplies and farm crops. Buildings and equipment for dairy, poultry, sheep, swine and other livestock provide adequate facilities for training in agriculture. Animals on the farm are registered and are of the highest quality.

(4) The dormitory and housing units, convenient to the campus, provide for both married and unmarried students.

Administrators of the school have been: Alma Greenwood, 1888 to 1891; George C. Christensen, 1891 to 1892; Newton E. Noyes, 1892 to 1921; Wayne B. Hales, 1921 to 1924; Milton H. Knudsen, 1924 to 1933; I. Owen Horsfall, 1933 to 1936; James A. Nuttall, 1936 to 1952; Lester B. Whetten, 1953.
List of Graduates 1955

TWO-YEAR CERTIFICATE OF COMPLETION IN AUTOMOTIVE REPAIR

Brierley, Vaughn R.

TWO-YEAR CERTIFICATE OF COMPLETION IN CLINICAL TECHNOLOGY (ASSOCIATE IN SCIENCE)

Skinner, Mariel

TWO-YEAR CERTIFICATE OF COMPLETION IN SECRETARIAL SCIENCE

Stettler, Marilyn

BACHELOR OF SCIENCE DEGREE IN AGRICULTURE

Allen, Gilbert H.  
Anderson, Austin Dee  
Anderson, J. LaMar  
Andrus, DeVon Franklin  
Anhder, LaMoine D.  
Atkinson, Sherwin J.  
Banner, Glen Ellis  
Beaver, Carrilyn Ethel  
Broadbent, Lynn C.  
Carroll, Donald H.  
Cook, Noel Laker  
Cope, Lloyd Johnson  
Davenport, Howard W., Jr.  
Eastman, Jack Keith  
Evans, Gayle W.  
Farnworth, Thomas G., Jr.  
Pawcett, Mar Otto  
Gillies, Earl Arland  
Gull, Dwain D.  
Haderlie, Gale Laron  
Harris, Jess Martin  
Hess, Daniel Henry  
Holmes, Lloyd Ivan  
Israelsen, Glen Andrew  
Iverson, Ronald Delano  
Jones, Norval Ralph  
Larsen, Alton E.  
Linford, James E.  
Mellor, Ashel Rex  
Merrell, William Orson  
Merrill, George A.  
Moody, Wendell Franklin  
Morgan, Edward E.  
Morriil, Laurence G.  
Mortenson, Clark  
Munk, Melvin Reed  
Nelson, Jay Gerald  
Nichols, Murray Leo  
Olsen, Donald Calvin  
Olson, Kirt Melvin  
Palmer, Gene W.  
Potter, Donald H.  
Ream, Lee Clark  
Rigby, Jay Golden  
Saunders, Richard L.  
Sayed, Mustafa Qasim  
Sparreboom, Pete, Jr.  
Speirs, Carl D.  
Spraker, Ralph E.  
Stewart, Gordon LeRoy  
Taylor, Robert E.  
Vanderford, John Walter  
Vaughn, John Owens  
Walker, George Cottam  
Wallentine, Max VanNess  
Wankier, Farrell T., Jr.  
Warner, Lloyd Claude  
Whipple, Ralph Charles  
Wilson, David LeRoy  
Young, Mark Francis

BACHELOR OF SCIENCE DEGREE IN BUSINESS AND SOCIAL SCIENCES

A-Wahid, A. Kamal  
Al-Khedery, Abdul Kadir  
Allen, Ross Lamont  
Arnett, Thomas Leonard  
Bate, Milford Craig  
Baugh, Clyde Frederick  
Baugh, Frederick B.  
Berntson, Clair Delbert
UBAHelor of Science Degree in Education

Adams, Garry Boyd
Athay, Morris B.
Baird, John Edwin
Ballif, Barbara
Barker, Bettie Darlene
Bartschi, Vilda E. Young
Beal, George Leon
Beck, Donald Vermall
Beck, Lyle A.
Beecher, Amelia Madsen
Bergeson, Helen
Berrett, Veda
Butler, Blanche
Bingham, Marlin E.
Bowers, Kenneth Maylon
Bradshaw, Karen Louise
Brown, Carol Rae
Brown, Cordell Jere
Brown, Naomi B.
Burg, Ruthe Blanche
Butcher, Vern R.
Butler, Mary Ann
Call, Fred Elmo
Carter, David Lavere
Channell, Ralph Reed
Christensen, Thella Mae Bergeson
Chugg, M. David
Clarke, Marguerite W.
Clayson, Maxine
Cliff, Lilly J.
Condie, Ada

Blackham, Mark Dean
Blamires, Robert Burton
Briscoe, Raymond Gene
Brock, Annette
Bybee, Junior Lee
Carleson, Harry, Jr.
Carter, John William
Christensen, Joanne
Deady, William Francis
Dinneen, Mary Louise
Dunford, Leah
Dunn, Van Francis, Jr.
Dyreg, Gail E.
Fellows, Udean
Ferrin, Val Leamon
Finlayson, Keith James
Fluckiger, Henry Lamont
Fonnesbeck, Genevieve
Gardner, Reed Pierpont
Gardner, Willard Leigh
Geddes, Garth Lowe
Giles, LaVerl Clegg
Gottfredson, Burt A.
Hanson, Ronald Soren
Hatch, Stanley Craig
Hawie, Michel
Haynie, Van Lloyd
Henderson, Edward Carl
Hirschi, Merial
Hodges, Richard Moris
Hoffman, James C.
Hugie, Vaughn
Hunsaker, Collin I.
Isom, Madelon
Jackson, Charles Bryan
Johanson, Donald Wayne
Johanson, Robert Bruce
Jolley, John Haskell
Jones, Charles Wendell
Jordan, Donna Rigby
Kendell, Karla
Klaich, Robert Joe
Knowledge, Russell Conrad
Krpmotic, Steve
Leonhardt, Merlin C.
Lewis, Richard Roland
Lorenat, Thomas Anthony
Lund, Frank E.
Madson, Ramona
McBride, Margo Lazon
McCalm, Dwight M.
Morawetz, Doris Gayle C.
Morawetz, Francis E.
Neeley, Kent M.
Nelson, Beverly
Nielsen, Peggy
Nye, Diane
Odd, Leonard Arthur
Olsen, Milton Joseph
Olson, Vincent Thoreson
Paloni, John S.
Paulsen, John Crawford
Petersen, James Gary
Petersen, Lawrence F.
Petersen, Lois
Pocock, Charles L. Jr.
Powell, Jane
Purser, LaConna
Richman, Jay T.
Rippon, Yvonne Joy
Robinson, Shirley M.
Sadoun, Abid
Sanders, Jerry Merlin
Simmons, DeWayne White
Snow, Naomi Jenkins
Sorensen, Marlin, Jr.
Sorensen, Ranae
Sprague, Gordon LeRoy
Stanton, Gloyd Roy
Starley, William S.
Thompson, George K.
Timmons, Gordon David
Warren, Robert John
Welker, Gerald D.
Wheatley, John Richard
LIST OF GRADUATES—1955

Condie, Dolan B.
Cornia, Ivan Edward
Cottle, L. Glen
Cragun, Ileen C.
Cragun, Molly Ann
Curran, Robert George
DeBloois, Joan
Delone, Judith Claire
Durham, Reed Connell Sr.
Ebert, Carl Eugene
Egan, Patricia
Eliason, Gloria Beth
Eyre, Lasca Osborne
Falslev, Harold Spencer
Fearn, Edith L.
Fisher, Charlotte
Forrester, Joyce
 Fouste, Dorothy Mae
Gardner, Delos Brigham
Gardner, Karma
Gardner, Lorean H.
Gardner, Zora M.
Gleason, Miweeze H.
Golding, Judy Pearce
Graviet, Donald LeRoy
Greathouse, Denice
Grimes, Juanita C.
Gunderson, Nora Walker
Hall, Alice Brough
Hanks, Urban Van
Hansen, Jeanine Showell
Hansen, Nancy Mildred
Harbertson, Norma C.
Harris, Edith Stuart
Harris, Jane
Harrison, Jay William
Haskell, Winthrop A.
Henderson, Gloria L. Jensen
Henrie, Argyle
Hill, Helen Peterson
Hoelscher, Jean Faxon
Hollingsworth, Clair M.
Hood, Mary Marie
Horlacher, Kathleen D.
Horsley, Hugh Andrew
Howard, Leona Joyce
Hull, Maxine R.
Iverson, Joan H.
Jackson, Carvel G.
Jacobson, Allen Peter
Jeffs, Roger Duane
Jensen, Bessie Gay
Jensen, Victor R.
Jensen, Charles M., Jr.
Jeppsen, Ruia
Johnson, Connie
Johnson, Marie T.
Johnson, Wendell Bart
Johnstone, Peggy Raye
Jones, Delores S.
Knowles, M. Janet
Kragthorpe, Dave S.
Larsen, Josephine C.
 Larson, Arvid J.
 Larson, Neil G.
LeGrand, Donna Marjorie
Lewis, Peggy Jane
Lind, Merla Robinson
Longhurst, Ada B. M.
Lyon, LaRee Nielsen
Magleby, Richard Harmon
Martin, James Osborne
Maughan, Walter Leon
McGuire, Bernice P.
McKay, Fredonna
Meldrum, LaMar Eva M.
Meyrick, Valena Rachel
Miller, Lorraine
Munford, LaRee
Nelson, Louis Lenzi
Nielsen, Colleen
Nielsen, Wallace Andrew
Nuttall, Norman D.
Ogden, Vera Mae
Oscarson, J. Darrell
Penney, Billie Bryan P.
Peterson, Eleanor Mae P.
Peterson, Palmera
Peterson, Ramond
Pickett, Louis Monte
Pratt, Dorothy Brough
Preece, Floren Stocks
Prince, Winona
Probert, Elaine
Puffer, Clark LeRoy
Purdue, Hazel Batchelor
Quayle, Evelyn E.
Raymond, Jack Clinton
Reeder, Karl D.
Reeves, Janis Renee
Reynolds, Joseph W.
Rice, Joan
Richardson, Frances, Marie Shoup
Robinson, Brian M.
Roghaan, Ralph
Rhode, June
Roskelley, Elma Joan Wilson
Satterfield, Arvetta H.
Schick, Dorothy
Shaw, Thora Wayment
Simmons, Dennis E.
Skabelund, Nancy Ann Bowen
Starman, Charles Donald
Stephens, E. Stirling
Stewart, Robert Potter
Strand, Astrid Mae
Thomas, Grace Bluemel
Thomson, Eldora
Thurmond, Theo Frances
Trontel, Matt Louis
Tullis, Colleen
VanDrimmelen, Thomas, Jr.
Vigor, Clarice M.
GRADUATES FROM COLLEGE OF SOUTHERN UTAH

Adams, Clemont
Bryner, Keith H.
Chatterley, Lillian J.
Farnsworth, Gale
Forsyth, Claudia Joseph
Heaton, LeGrande J.
Holman, Bethel S.
Hunt, Carmen
Jensen, Norris
Johns, Bernice Goldia
Liston, Douglas I.
Lynn, Fay N.

Mirci, Kelly
Nay, Alvin D.
Petty, Jane B.
Reynolds, Grace Irwin
Robb, Ward S.
Roberts, Athene Stewart
Robinson, Gilbert Boyd
Stokes, Janet Fife
Tingen, Laurel D.
Whitney, Max E.
Williams, Pearl Pace
Woodbury, Rulan D.

BACHELOR OF SCIENCE DEGREE IN ENGINEERING AND TECHNOLOGY

AGRICULTURAL ENGINEERING

Bennett, Lynn Lyman
Gruber, Jonny Jehuda

Stringham, Glen Evan
Wasden, Darrel James

CIVIL ENGINEERING

Calder, Paul H.
Carlson, Carl John
Clyde, Jerald Reed
Davis, Elmer S.
Demass, Jack Louis
Doros, Albert James
Hansen, Richard Harold
Hunter, James Pierce
Judd, Harl Elmer
Madsen, Melvin Leslie
Manzione, Frank D.
McCallister, Karl D.

McGuire, Roy Edward
McQuivey, Richard M.
Olsen, Elliot B.
Owens, Ned
Rafique, Mohammed Abdur
Sorensen, Richard K.
Squires, Richard Rulon
Srinivasan, Kuppuswamy
Toolson, Gene A.
Valentine, Harold J.
Waki, Mitsuo
Yokomizo, Ben J.

ELECTRICAL ENGINEERING

Blackham, Daryl Kent
Brown, Fon Ray
Dunn, Gerald Alan
Hansen, C. Blaine
Holmes, Wayne Walker

Shaw, Alan W.
Snow, Gordon
Wardleigh, George R.
Wyatt, Clair Leon

TOOL ENGINEERING

Anderson, John Carroll
Bills, Jay Pope
MacDonald, James H.

Martin, Lloyd Richard
Robinson, Eli Merrill
Veibell, Floyd Carl
LIST OF GRADUATES—1955

INDUSTRIAL EDUCATION

Anderson, Richard W.
Beal, Steven Olen
Benson, Ariel D.
Bischoff, Garth Lamon
Crokston, Douglas O.
Cutler, Mark L.
Felix, Arlo Grant
Flutot, Robert L.
Iwami, Noboru
James, Don E.
Lundgreen, Hartley B.
Mickelson, Murray Ray
Petersen, Molen Larry
Vanclief, Richard
Williams, Leland
Windchief, Christian

INDUSTRIAL TECHNOLOGY

Baier, Richard George
Briggs, Wallace Green
Clark, Charles G.
Cummings, Clifford R. Jr.
Dee, Duane LaMar
Dew, Frank Robert
Eddins, Boyd LaVell
Falck, Louis K.
Fehmi, Nezar Shakir
Kamand, Anthony Francis
Petrosian, Sooren
Robins, Jack Stephens
Rondel, Albert Oliver
Torgesen, Robert Keith
Smith, James Albert
Smith, Lynn R.
Thurston, Lloyd Jay
Wing, Marvin

BACHELOR OF SCIENCE DEGREE IN FOREST, RANGE, AND WILDLIFE MANAGEMENT

FOREST MANAGEMENT

Brown, David Monroe
Payne, Richard
Wardleigh, Ronald Dale
Wheeler, Richard A.

RANGE MANAGEMENT

Brandvik, Arthur
Hafterson, John Albert
Hoffman, M. Eugene
Lodzinski, David P.
Younger, Ronald James

WILDLIFE MANAGEMENT

Bartonek, James Cloyd
Fishbaugh, William Dean
Johnson, Robert Earle
Martin, Jerry Roy
Walstrom, Jack Warren
Weast, Gerald Dean

BACHELOR OF SCIENCE DEGREE IN HOME AND FAMILY LIVING

Anderson, Carol Lee
Balls, Helen
Bateman, Mary Louise
Bell, Carolyn Kaye J.
Benson, Annie
Boothe, Faye Winborg
Carter, Emma Louise
Carter, Bonnie Hanson
Christensen, Janet
Christensen, Laraine J.
Daniels, Marilyn
Donnellon, Lorna Karen
Eggen, Martha Janet
Fassio, Joanne
Keller, Doris Elaine
Lind, Charlene
Moore, Dorothy Anne
Morrill, Olive L.
Moss, Rhea
Nielsen, Carol Margaret
Roberts, Carolynn NaDean
Schmutz, Elaine
Smith, Annette
Thain, LaDawn
Thorangkul, Dana
Trueblood, Mary Jeanne Eggen
Walker, Fawn Davies
Ward, Sharon Mumford
Worley, Ruth Vallee
Zollinger, Rosalind
### BACHELOR OF SCIENCE DEGREE IN HUMANITIES AND SCIENCES

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<th>Allen, Lamonte Dunn</th>
<th>Jenson, L. Ann Nelson</th>
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<td>Wright, Larry J.</td>
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</table>
LIST OF GRADUATES—1955

MASTER OF EDUCATION DEGREE

MARK R. ANDERSON
McRAY CLOWARD
LEWIS BRADY DUNN
ALFRED J. GLAUSER
CARL MYRLIN HANSEN
MYRTLE YEATES HOLMES

MASTER OF SCIENCE

MILTON CHARLES ABRAMS; Some politico-military factors in the background and training of the American soldier; Political Science Department; Dr. M. R. Merrill, major professor.

ROBERT DELL ADAMSON; The Salt Lake group in Cache Valley, Utah and Idaho; Geology Department, Dr. Clyde T. Hardy, major professor.

ROBERT H. ALFANDARY; The European defense community; Political Science Department; Dr. M. R. Merrill, major professor.

IBRAHIM J. ALKHALISI; The effects of various levels and sources of fluorine and the fattening ration of Rambouillet, Targhee, and Columbia lambs; Animal Husbandry Department; Prof. M. A. Madsen, major professor.

SHIRLEY RUTH ALLEN; A study of women's physical education service course selection at Utah State Agricultural College; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor; Prof. Lois Downs, thesis director.

ELBERT JAMES ANDERSON; Parent participation at Central School of Brigham City, Utah; Education Department, Dr. E. A. Jacobsen, major professor.

GAYLEN LAMB ASHCROFT; Soil additives and their effect on the yield of various crops and the physical properties of an agricultural soil; Agronomy Department; Dr. Sterling A. Taylor, major professor.

R. BRUCE ASHMAN; A Cytological study of the induced octoploid of an Agropyron hordeum hybrid; Botany Department; Dr. W. S. Boyle, major professor.

RUSSELL OWEN ASPLEND; The application of some biochemical methods to a study of the genotypes associated with dwarfism in Hereford cattle; Chemistry Department; D. A. Greenwood, major professor.

DARAB ASSAAD; A comparison of starters, temperatures of warm room and salt concentration in the manufacture of Danish Type Swiss Cheese; Dairy Manufacturing Department; Prof. A. J. Morris, major professor.

DARRELL D. ATKINSON; A study of comparisons between the Ute Indians and native whites at Union High School; Education Department; Dr. John C. Carlisle, major professor.

JOHN M. BAILEY; The capital structure of agricultural cooperatives in Utah, 1958; Agricultural Economics Department; Dr. W. P. Thomas, major professor.

ORAL LAMB BALLAM; Ring Around Elizabeth, a production thesis; Speech and Drama Department; Prof. Floyd T. Morgan, major professor.

DON L. BECKER; Classical song recital, May 8, 1955; Fine Arts Department; Dr. Walter Welti, major professor.

KENNETH MALCOLM BENSON; Phenotypic variations of Kochia scoparia; Agronomy Department; Dr. D. R. McAllister, major professor.

MARIAN BLACKINGTON; A study of the graduation requirements in physical education for women in selected western colleges and universities; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor; Prof. Lois Downs, thesis director.

BERTRAM EMIL BORDEWICK; The isolation of tobacco mosaic virus by paper electrophotography; Botany Department; Dr. G. W. Cochran, major professor.
STANLEY M. BOYLE; School drop-outs and how they might be diminished in Rigby High School; Education Department; Dr. E. A. Jacobsen, major professor.

MERRITT EPHRAIM BRADLEY; A program of teacher made tests and testing devices for improving industrial arts instruction; Industrial Education Department; Prof. William E. Mortimer, major professor.

RUTH CHIPMAN BUSCH: The Iranian student in Logan, an exploratory study of foreign student social experience and adjustment; Sociology Department, Dr. T. R. Black, major professor.

HENRY KEITH BUSHMAN; A comprehensive study evaluating driver education in the senior high school from analyses of driving records of Salt Lake City high school students; Industrial Education Department; Prof. William E. Mortimer, major professor.

RUSSELL WILLIAM CARRUTH; Attitudes of Ogden City teachers toward merit rating; Education Department; Dr. E. A. Jacobsen, major professor.

GROVE T. CARTER; Concept formation among visualizers and more abstract thinkers; Psychology Department, Dr. Arden Frandsen, major professor; Prof. Heber C. Sharp, thesis director.

MARCUS VESS CARVER; The relative effectiveness of rhetorical question and illustrative introductions; Speech and Drama Department; Dr. Chester J. Myers, major professor; Dr. Rex E. Robinson, thesis director.

RALPH REED CHANNELL; Self inventories, teacher ratings and interviews as a means of determining maladjustment; Psychology Department; Dr. Arden Frandsen, major professor.

URBAN STERLING CHENEY; Student management practices in secondary school shops of Utah; Industrial Education Department; Prof. William E. Mortimer, major professor.

GLEN A. CHRISTENSEN; The relationship between selected socio-economic factors and knowledge and attitudes of Logan, Utah, residents pertinent to alcoholism; Sociology Department; Dr. William A. DeHart, major professor.

JAMES WESLEY CHRISTENSEN; A study of the practices and trends in student government in the elementary school; Education Department; Dr. E. A. Jacobsen, major professor.

JERALD N. CHRISTIANSEN; Stability of Rocky Ford Dam; Civil Engineering Department; Prof. Melvin J. Greaves, major professor.

WILLIAM V. CHRISTIANSEN; The employer's opinions of Navajo student employees during the summer of 1954; Education Department; Dr. Jefferson N. Eastmond, major professor.

ROSS K. CLEMENTS; An economic analysis of finishing beef cattle in the major feeding areas of Utah in the 1953-54 season; Agricultural Economics Department; Prof. Lynn H. Davis, major professor.

STEPHEN A. CORAY; Agglutinin absorpton of Micrococcus pyogenes var. aureus involved in synovitis; Bacteriology Department; Prof. Garth A. James, major professor.

JOSEPH COULAM; A study of formal education completed by the building trades personnel of vocational region one; Industrial Education Department; Prof. William E. Mortimer, major professor.

CLAUDE RAYMOND COWLEY; An evaluation of the health and physical education programs for boys in selected Utah junior high schools; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor; Prof. Israel C. Heaton, thesis director.

ROBERT B. DAHLGREN; Factors affecting mourning dove populations in Utah; Wildlife Management Department; Dr. Jessop B. Low, major professor.

WILLIAM HATCH DAVIS; Detection of coumarin in seeds involving crosses between two species of Melilotus; Agronomy Department; Dr. D. R. McAlister, major professor.
THOMAS JAMES DENMAN; The influence of soil moisture conditions on the absorption of phosphorus by plants from calcareous soils; Agronomy Department; Dr. H. B. Peterson, major professor.

MILO LEROY DEW; The effects of incubating chicken and turkey eggs under pressure; Poultry Department; Dr. J. David Carson, Jr., major professor.

ROSSLYN M. EPPICH; A study of student drop-outs at the South Cache High School 1948-1953; Education Department; Dr. L. G. Noble, major professor.

ROSS WRIGHT ESKELESON; A comparison of over-snow vehicles produced at Utah State Agricultural College; Industrial Education Department; Prof. Charles W. Hailes, major professor; Prof. Reynold K. Watkins, thesis director.

ROBERT B. FERGUSON; The pellet-group count method of censusing mule deer in Utah, Wildlife Management Department; Dr. Jessop B. Low, major professor.

DONALD ROBERT FLOOK; A study of the winter foraging habits of mule deer in enclosures in Northern Utah with a test of the half-and-half sampling technique; Range Management Department; Dr. L. A. Stoddart, major professor.

RONALD BROWN FOSTER; Seedling establishment of alfalfa comparing four varieties, three fungicides and two inoculums; Agronomy Department; Dr. D. R. McAllister, major professor; Dr. Marion W. Pedersen, thesis director.

WAYNE TRAVIS FRANK; The impact of foreign trade upon the western wool industry; Economics Department; Prof. Evan B. Murray, major professor.

BLONDA LORRAINE FRYKMAN; The status of teacher rating in theory and in practice; Education Department; Dr. E. A. Jacobsen, major professor.

ALFRED LEROY GARDNER; A study of the farm mechanics program of three Negro high schools in Lowndes County, Georgia; Agricultural Education Department; Prof. Stanley S. Richardson, major professor.

HERBERT REED GARDNER; The development and testing of an apparatus to measure radial diffusion through porous media; Agronomy Department; Dr. Sterling A. Taylor, major professor.

SPENCE L. GARDNER; An analysis of parents attitudes towards physical education and its objectives; Physical Education and Recreation Department; Prof. Israel Heaton, major professor.

MURRAY J. GAVEL; Evaluation of sprinkler systems in Northern Utah; Civil Engineering Department; Dr. Wayne D. Criddle, major professor.

KARIM GOODARZY; “B” Plan seminar reports; Entomology Department; Dr. Donald W. Davis, major professor.

JACK BOND GOODWIN; An economic analysis of alfalfa seed production, costs and returns in Utah, 1952; Agricultural Economics Department; Dr. V. L. Israelsen, major professor.

BERtha PITCHER GREAVES; A public relations handbook for teachers; Education Department; Dr. Jefferson N. Eastmond, major professor.

DALLAS A. GREEN; An evaluation of the curriculum offerings of the Gunnison Valley High School by former students; Education Department; Dr. John C. Carlisle, major professor.

DONALD CALEB HALES; Evaluation of stream bottom fauna sampling techniques as used in the Logan River; Wildlife Management Department; Dr. William F. Sigler, major professor.

NORMAN VICTOR HANCOCK; A management study of the Cache elk herd; Wildlife Management Department; Dr. Jessop B. Low, major professor.

NORVEL LEON HANSEN; A study of parents’ attitudes and interests toward physical education in Bonneville County, Idaho; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor.

ALBERT WILLIAM HEGGEN, JR.; Factors affecting chukar partridge production under game farm conditions; Wildlife Management Department; Dr. Jessop B. Low, major professor.
GASTON MEANS HENSONLEY; The political career of Richard M. Nixon; Political Science Department; Dr. M. Judd Harmon, major professor.

JAMES L. HERNDON; Instructions for the use of the key-driven calculator; Education Department; Dr. John C. Carlisle, major professor; Prof. Floris S. Olsen, thesis director.

JUNIOR BRISTO HILMON; A revised technique for measuring forage utilization; Range Management Department; Prof. A. D. Smith, major professor.

DONALD J. HOBBS; Types of tests and other factors used in grading physical education students in the secondary schools of the Idaho Sixth District; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor.

THOMAS B. HORNIG; A study of the hand craft experiences of the pre-high school students of Oregon; Industrial Education Department; Prof. William E. Mortimer, major professor.

FRED JOHN HUGIE; Characteristics of attendance at Preston High School; Education Department; Dr. E. A. Jacobsen, major professor.

JOHN EARL JOHNSTON; Variability of secondary school pupils in vocal music classes in Box Elder High School with respect to music achievement in grades seven to twelve; Education Department; Dr. John C. Carlisle, major professor.

ARTHUR C. JUDD; Evaluation study of a three year cooperative project in teacher education; Education Department; Dr. E. A. Jacobsen, major professor.

SUWAN KASETSUWAN; The hatchability of chicken eggs as affected by differing treatment prior to incubation; Poultry Department; Dr. C. I. Draper, major professor.

RAMZI MUSTAFA KHALIDY; Chemical thinning studies on peaches in Utah; Horticulture Department; Dr. Robert A. Norton, major professor.

M. ABDUL AZEEZ KHAN; Carbon dioxide and sodium bicarbonate methods of PO4 estimation in calcareous soil as an aid for predicting phosphate requirements in alfalfa; Agronomy Department; Prof. Rex F. Nielson, major professor.

JAMES T. KRYGIER; Seeds in the forest floor of ponderosa pine type; Forest Management Department; Dr. T. W. Daniel, major professor.

HEBER BURNELL LAMB; A comparison of the scholastic standing of participants and non-participants in extracurricular activities at Lincoln County High School, 1953-54; Physical Education and Recreation Department; Prof. Israel C. Heaton, major professor.

MELVIN ARTHUR LARKIN; The history of the Logan Temple; History Department; Dr. Joel E. Ricks, major professor; Dr. S. George Ellsworth, thesis director.

IVAN EDWARD LEE; A study and evaluation of the automotive program at the Utah State Agricultural College; Industrial Education Department; Prof. Charles W. Hailes, major professor.

JOHN DONALD McCONAHAY; The economic impact of Hill Air Force Base on the Ogden area; Economics Department; Prof. Leo M. Loll, Jr., major professor.

V. R. MAGLEBY; “B” Plan seminar reports; Dairy Husbandry Department; Prof. George B. Caine, major professor.

JOHN ARMSTRONG MILLS; Nutritive value of some important range plans for spring and summer grazing; Range Management Department; Dr. L. A. Stoddard, major professor.

HARVEY D. MOORE; An analysis of factors in reading achievement scores of the third and sixth grades of Garfield County; Education Department; Dr. E. A. Jacobsen, major professor.

DAOOD S. MULTAG; The study of aquatic insects of Logan River; Entomology Department; Dr. J. S. Stanford, major professor.

NOLAND F. NELSON; Factors in the development and restoration of waterfowl habitat at Ogden Bay Refuge, Weber County, Utah; Wildlife Management Department; Dr. Jessop B. Low, major professor.
SHERWIN CLIVE NELSON; Effects of the insecticide endrin upon the alkaline phosphatase level of the albino rat. Physiology Department; Dr. T. L. Bahler, major professor.

WILLIS G. NELSON; An evaluation of Madison High School in terms of selected areas of the 1950 Evaluative Criteria; Education Department; Dr. John C. Carlisle, major professor.

JOHN MOHLER OGLESBY; Factors affecting length of tenure of vocational agriculture teachers who are recent graduates of Utah State Agricultural College; Agricultural Education Department; Prof. Stanley S. Richardson, major professor.

ROBERT PAUL OLSON; The biology and seasonal distribution of Eucalli-phora lilaea (Walker) in Cache County, Utah; Entomology Department; Dr. Donald W. Davis, major professor.

GEORGE EDWARD PATTERSON; Lactation curves of Holstein cows as influenced by age, gestation, and season of freshening; Dairy Husbandry Department; Prof. George B. Caine, major professor; Dr. George E. Stoddard, thesis director.

JOHN E. PHELPS; The adaptability of the Turkish chukar partridge (Alectoris graeca meinaer) in Central Utah; Wildlife Management Department; Dr. Allen W. Stokes, major professor.

HAROLD WILLIAM PHILLIPS; Proposed guidance program for Montpelier High School; Education Department; Dr. E. A. Jacobsen, major professor.

ALBERT A. PIEPER; Hermann Hesse, a biographical appraisal and a translation of "Kindeseele"; English Department; Dr. Hubert W. Smith, major professor.

ROBERT G. PUBLICOVER; A guide to effective testing for counseling college students in their choice of studies; Education Department; Dr. Jefferson N. Eastmond, major professor.

QUO SIH-GWAN; The effect of feeding various levels of sucrose to turkeys for short periods prior to slaughter; Poultry Department; Dr. J. O. Anderson, major professor.

GERALD HUGO RAAT, JR.; A study of instructional practices and recommendations of thirty-five successful biological science teachers in the secondary schools of Utah; Education Department; Dr. John C. Carlisle, major professor.

ALMA KENT RANDALL; Determining the extent in terms of behaviors growth to which industrial arts teachers in Utah are achieving the objectives of industrial arts; Industrial Education Department; Prof. William E. Mortimer, major professor.

MOZAFFAR M. SAMIY; The political powers and practices of the secretary-general of the United Nations; Political Science Department; Dr. M. R. Merrill, major professor.

GEORGE WOODARD SANDBERG; Hydraulics and performance study of the Hooper Pilot Drain; Irrigation and Drainage Engineering Department; Prof. A. Alvin Bishop, major professor.

WILLIAM BLAUVELT SCHREEDER; The public health significance of disposal and use of Logan sewage as irrigation water; Civil Engineering Department; Dr. O. W. Israelsen, major professor, Prof. A. Alvin Bishop, thesis director.

DELMONT KING SMITH; The preparation of a series of esters of 3-methyl, 3-hexanol; Chemistry Department; Dr. Theodore M. Burton, major professor.

DONALD ALLEN SMITH; An economic evaluation of selected treatments for avian botulism in waterfowl on Utah marshes, 1953-54; Wildlife Management Department; Dr. Jessop B. Low, major professor.

ROBERT IRVIN SMITH; The breeding territory and its relationship to waterfowl productivity at Ogden Bay Bird Refuge; Wildlife Management Department; Dr. Jessop B. Low, major professor.
WILLIAM LAVON SMITH; The establishment of a grade reading level by the Stanford-Binet Intelligence Test; Psychology Department; Dr. Arden Frandsen, major professor.

AROON SONGMANI; "B" Plan seminar reports; Horticulture Department; Prof. Robert K. Gerber, major professor.

CHARLES DONALD STARMAN; The effects of maturation and learning in the acquisition of a complex motor skill; Psychology Department; Dr. Arden Frandsen, major professor.

GLEN L. STEED; Consumptive use of water by major farm crops in the Escalante Valley of Utah; Irrigation and Drainage Engineering Department; Dr. D. K. Fuhriman, major professor.

IRWIN THOMPSON STODDARD; A study of the financial management of athletic and physical education programs in the Idaho Sixth District; Education Department; Dr. E. A. Jacobsen, major professor; Prof. H. B. Hunsaker, thesis director.

DOUGLAS CHESTER STRONG; An economic evaluation of feeding sucrose to beef and swine a few days prior to slaughter; Agricultural Economics Department; Dr. G. T. Blanch, major professor.

GLEN NORTH TAYLOR; Galvanotaxic response of fish to pulsating direct current; Wildlife Management Department; Dr. William F. Sigler, major professor.

THOMAS ALVA TAYLOR; A study of thirty-five parent teacher conferences at the elementary training school, Utah State Agricultural College; Education Department; Dr. John C. Carlisle, major professor.

LLOYD MICHAEL THEURER; A school administrator's experiences in motivating teacher personnel and citizens to define over-all educational objectives; Education Department; Dr. Jefferson N. Eastmond, major professor.

WILLIAM A. THOMAS; Historical movement of school reorganization in Bingham County, Idaho; Education Department; Dr. E. A. Jacobsen, major professor.

ROBERT DON THOMSON; A study of basic principles of trampoline instruction; Physical Education and Recreation Department; Prof. H. B. Hunsaker, major professor; Prof. Israel C. Heaton, thesis director.

FRANK RAY TIDWELL; A history of the men's physical education program at Utah State Agricultural College; Physical Education and Recreation Department; Prof. Israel C. Heaton, major professor.

STEPHEN SZLATENYI TILLETT; Some preliminary investigations in the Montia perfoliata complex; Botany Department; Prof. A. H. Holmgren, major professor.

WALTER E. ULRICH, JR.; What the industrial arts instructors of the State of Utah consider a sound public relations program; Industrial Education Department; Prof. William E. Mortimer, major professor.

ROBERT BRUCE TURNER; Determination of digestibility of lignin by mule deer; Range Management Department; Prof. A. D. Smith, major professor.

W. DEVERL TURNER; The construction of a comprehensive final examination in business finance; Education Department; Prof. V. D. Gardner, major professor.

WALTER E. ULRICH, JR.; What the industrial arts instructors of the State of Utah consider a sound public relations program; Industrial Education Department; Prof. William E. Mortimer, major professor.

NOLA VAN ORDEN; The reactions of titanium tetrachloride with the alkali metal chlorides at elevated temperatures; Chemistry Department; Dr. Melvin C. Cannon, major professor.

WILSON CLARK WALKER; Comparison of the Utah State Agricultural College mathematics entrance examination, computational versus multiple-choice; Psychology Department; Dr. Arden Frandsen, major professor.

MAX WEAVER; The development and transition of the art of Calvin Fletcher from naturalism to abstraction during the period 1895-1953; Fine Arts Department; Dr. John C. Carlisle, major professor.

GEORGE W. WHEATLEY; Linkage relationships in group IV in barley; Agronomy Department; Dr. D. K. McAllister, major professor; Dr. R. W. Woodward, thesis director.
EDGAR L. WIGHT; Organization and conduct of instructional field trips; Education Department; Dr. E. A. Jacobsen, major professor.

ARLEN C. WILKES; Survey of professional attitudes and analysis of changes as a result of the U.E.A. local leadership school; Education Department; Dr. Jefferson N. Eastmond, major professor.

DORAN FRANE WILKES; A survey of industrial arts programs in Wyoming schools; Industrial Education Department; Prof. Charles W. Hailes; major professor.

LYMAN SESSIONS WILLARDSON; Energy losses in aluminum irrigation pipe due to deflections at the couplers; Civil Engineering Department; Prof. J. E. Christiansen, major professor.

CLEVE R. WINKEL; Effects on urinary metabolites of rats fed various edible fats; Dairy Manufacturing Department; Prof. A. J. Morris, major professor; Dr. G. E. Stoddard, thesis director.

JOHN COOPER WINN; A comparative study of the Mexican-Indian students in the Carbon County Schools; Education Department; Dr. John C. Carlisle, major professor.

DOROTHY JEAN YORK; The early development of the Pocatello-Fort Hall region; History Department; Dr. Joel E. Ricks, major professor; Dr. S. George Ellsworth, thesis director.

STANFORD YOUNG; Survey and evaluation of big game exclosures in Utah; Wildlife Management Department; Dr. George H. Kelker, major professor.

GLEN R. ZIMMERMAN; A study of the variabilities of certain physiological tests as they relate to the participants in a five day basketball tournament; Physical Education and Recreation Department; Prof. H. B. Hunsker, major professor; Prof. Dale O. Nelson, thesis director.

CLINTON DAVID ZOLLINGER; Criteria for evaluating procedures and techniques used in handling supplies in the farm mechanics departments in Utah high schools; Agricultural Education Department; Prof. Stanley S. Richardson, major professor.

MASTER OF FORESTRY DEGREE

WILLIAM SHERIDAN COGHILL

DOCTOR OF PHILOSOPHY DEGREE

LOUAY T. KADRY; Soil-plant relation of the bicarbonate anion to lime-induced chlorosis; Agronomy Department; Dr. D. W. Thorne, major professor.
## Summary of Attendance 1954-55

Regular School Year 1954-55 (September to June)

### Table of Attendance

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<th>Sub Coll.</th>
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