# Calendar 1949

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<th>JANUARY</th>
<th>FEBRUARY</th>
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COLLEGE CALENDAR FOR ACADEMIC YEAR 1949-1950

FALL QUARTER

September 19, Monday .............. First faculty meeting.
September 22, Thursday ............. Aptitude and other tests for all new students.
September 23, Friday ............... Registration of former students.
September 24, Saturday ............. Registration of all new students.
September 26, Monday .............. Instruction begins.
October 24, Monday ................. Prospective graduates submit applications for candidacy.

November 23, Wednesday ............ College closes for Thanksgiving Recess at 12 M.
November 28, Monday ............... Classes are resumed.
December 17, Friday ............... Fall Quarter ends.

WINTER QUARTER

January 2, Monday, and 3, Tuesday .......... Registration. Candidates submit applications for graduation.
January 4, Tuesday ................. Instruction begins.
March 15, Wednesday ............... Winter Quarter ends.

SPRING QUARTER

March 20, Monday, and 21, Tuesday .......... Registration.
March 22, Wednesday ............... Instruction begins.
May 28, Sunday ................... Baccalaureate Service.
June 2, Friday ..................... 57th Commencement.

SUMMER QUARTER 1950

June 5, Monday ..................... First Session begins.
July 14, Friday ..................... First Session ends.
July 17, Monday ..................... Second Session begins.
August 18, Friday ................... Second Session ends.
1. Main Building—Administrative Offices of College, Agricultural Experiment Station, Schools of Arts and Sciences, Commerce and Education. Alumni Office, Auditorium, Extension Division, Book Store.
2. President's Residence
3. Smart Gymnasium
4. Forestry Building
5. Widtsoe Hall—Chemistry, Physics
6. L. D. S. Institute
8. Stadium House and Stadium
10. Animal Industry Building
11. Plant Industry Building
12. Quadrangle
13. Amphitheater
14. Mechanic Arts Building
15. Engineering Building
16. Commons Building—Home Economics, Cafeteria; Associated Students Offices.
17. Library
18. Lund Hall, Women's Dormitory
19. Temporary Union Building
20. Greenhouses
22. Poultry Plant
23. Veterinary Science Buildings
24. Rural Arts Building
25. Technology Building
26. Storage and Maintenance Buildings
## ADMINISTRATION

### Board of Trustees

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
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<tr>
<td>Thorpe B. Isaacson</td>
<td>Salt Lake City</td>
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<tr>
<td>W. W. Merrill</td>
<td>Logan</td>
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<tr>
<td>L. C. Montgomery</td>
<td>Heber City</td>
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<tr>
<td>Merrill N. Warnick</td>
<td>Pleasant Grove</td>
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<tr>
<td>D. A. Sneen</td>
<td>Salt Lake City</td>
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<tr>
<td>Ella V. Reeder</td>
<td>Brigham City</td>
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<tr>
<td>Arthur Woolley</td>
<td>Ogden</td>
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<td>Glen G. Nielsen</td>
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<td>Fred M. Nye</td>
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<td>Herschel Bullen</td>
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<tr>
<td>Charles R. Hunter</td>
<td>Cedar City</td>
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<tr>
<td>Carl W. Peterson</td>
<td>Kenilworth</td>
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<td>Heber Bennion, Jr.</td>
<td>Salt Lake City</td>
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<tr>
<td>W. W. Gardner, President, Alumni Association</td>
<td>Salt Lake City</td>
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<tr>
<td>Russell E. Berntson, Secretary-Treasurer</td>
<td>Logan</td>
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### Officers of Administration

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
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<tr>
<td>Franklin S. Harris</td>
<td>President</td>
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<tr>
<td>Carl Frischknecht</td>
<td>Director, Extension Service</td>
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<tr>
<td>R. H. Walker</td>
<td>Director, Agricultural Experiment Station and Dean, School of Agriculture</td>
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<tr>
<td>H. Wayne Driggs</td>
<td>Director, Branch Agricultural College</td>
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<tr>
<td>W. L. Wanlass</td>
<td>Dean, School of Commerce</td>
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<tr>
<td>Ernst A. Jacobsen</td>
<td>Dean, School of Education</td>
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<tr>
<td>Lewis M. Turner</td>
<td>Dean, School of Forest, Range and Wildlife Management</td>
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<td>B. L. Richards</td>
<td>Dean, Graduate School</td>
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<tr>
<td>Carlton Cumsee</td>
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<tr>
<td>Ethelyn O. Greaves</td>
<td>Dean, School of Home Economics</td>
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<tr>
<td>Jerald E. Christiansen</td>
<td>Dean, School of Engineering and Technology</td>
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<td>Milton R. Merrill</td>
<td>Dean, Summer Quarter</td>
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<td>Daryl Chase</td>
<td>Dean of Students</td>
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<td>Ione B. Daniel</td>
<td>Dean of Women</td>
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<tr>
<td>King Hendricks</td>
<td>Director of Libraries</td>
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<tr>
<td>Russell E. Berntson</td>
<td>Executive Secretary and Treasurer</td>
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<tr>
<td>Eric A. Johnson</td>
<td>Purchasing Agent and Manager of Bookstore</td>
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<td>William H. Bell</td>
<td>Registrar</td>
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<tr>
<td>E. W Timberlake, Colonel</td>
<td>Commandant, R.O.T.C.</td>
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<td>C. Lester Pocock</td>
<td>Chairman, Public Relations</td>
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<tr>
<td>Vera Carlson</td>
<td>Secretary to the President</td>
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<tr>
<td>Sylvan Erickson</td>
<td>Assistant Secretary and Treasurer</td>
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<tr>
<td>Harold M. Wadsworth</td>
<td>Superintendent of Buildings and Grounds</td>
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The Deans' Council consists of the President, all Deans, the Registrar, the Executive Secretary and Treasurer, and the Directors of the Agricultural Experiment Station and the Extension Service.

### Faculty Committees

The President of the College is ex officio a member of each standing committee.

- **Assemblies**—The President, Dean of Students, Professors Fogelberg, N. W. Christiansen, Myers, Student Representatives.
- **Athletic Council**—Professors Hendricks, Cuine, H. B. Hunsaker, Board of Trustees Representative, Mr. Berntson, Timberlake, J. E. Christiansen, Chase, Alumni Secretary, "A" Men's President, Student Body President.
- **Attendance and Scholarship**—Professors Floyd, Brits, Giddings, Lyons, West, D. F. Peterson, Jr., V. L. Israelsen.
- **Awards and Honors**—Professors Ricks, Geddes, Milligan, W. P. Thomas, Blanch, Kalker, B. Johnson, Bradford.
Credits and Admissions—Professors H. C. Sharp, Royle, Hayward, Neuberger, Jones, N. S. Cannon, Registrar.


Graduate Council—Deans B. L. Richards, Culmsee, E. O. Greaves, Professors Carlisle, Williams, Hendricks, Thorne, Roskelley, Stoddart.

Graduation—Professors Symons, Mortimer, Kelker, L. E. Harris, Stone, Meyer, Porter.

High School Relations—Mr. Pocock, Professors Jacobsen, Cawley, Noble, Vickers, Chase.

Housing—Mr. Pocock, Van Shaar, Dean of Women, Cotter.

Library—Academic Deans, Director of Libraries.

Loan Fund—Mr. Bernston, Chase.

Lyceum—Professors Chase, Fugleberg, N. W. Christiansen, Mr. Bernston.

Personnel and Guidance—Dean of Students, Dean of Men, Registrar, Professors Maeser, Stone, D. W. Thorne, Humpherys, Burns.

Pre-Medical and Pre-Dental Work—Professors Hammond, Culmsee, Gunnell.


Registration—Academic Deans, Registrar, Chase, Professors Hayward, H. B. Hunsecker.

Schedule—Professors Ralph Richards, W. W. Smith, Kelker, Neuberger, Arrington.

Social Affairs Committee—Dean of Students, Dean of Women, Professors Heaton, Blaser, Burgoyne, Downs, Banks.

Student Organizations—Dean of Students, Dean of Women, Professors Holmgren, Ludlow, Banks, Mr. S. Erickson.

Teacher Placement—Professors Jacobsen, Mortimer, Humpherys, Carlisle, Cawley.

Emeritus Faculty

Peterson, Elmer George, B.S., A.M., Ph.D., LL.D. President Emeritus

(Founded in 1926, Elected 1936) Director of Special Research

Peterson, William, B.S., LL.D. Director Emeritus, Extension Service

Pedersen, N. Alvin, A.B., Ph.D. Dean Emeritus, School of Arts and Sciences

Greaves, Joseph E., B.S., M.S., Ph.D. Professor Emeritus of Bacteriology and Biochemistry

Arnold, Frank Russell, A.B., M.A. Professor Emeritus of Modern Languages

Frederick, Hyrum John, D.V.M. Professor Emeritus of Veterinary Science

Newey, Aaron, B.S. Professor Emeritus of Metal Work

Kyle, Charlotte, A.B., A.M. Professor Emeritus of English

Jensen, George C., A.B., M.A. Professor Emeritus of Modern Languages

Daines, Franklin D., A.B., M.A., Ph.D. Professor Emeritus of Political Science

Peterson, Parley E., A.B., C.P.A. Professor Emeritus of Accounting

Swenson, D. A., B.S. Professor Emeritus of Woodwork and Building Construction

Moen, Johanna, B.S. Professor Emeritus of Textiles and Clothing

Dancy, Charlotte, E., R.N. Professor Emeritus of Physiology

Peterson, Henry, A.B., M.A. Professor Emeritus of Psychology

McClellan, Charles E., A.B., M.A. Professor Emeritus of Education

Brown, Almeda P., B.S., M.A. Professor Emeritus of Home Economics

Sorensen, Alma Nicholas, A.B., A.M. Professor Emeritus of English

Stewart, R. H. Professor Emeritus, County Agricultural Agent

Evans, R. J., B.S., Ph.D. Professor Emeritus of Agronomy

Fletcher, Calvin, B.Pd. Professor Emeritus of Art

Barrows, Effie S., B.S. Professor Emeritus, Extension Home Furnishings Specialist

Agren, Ellen Professor Emeritus, Home Demonstration Agent

Alder, Byron Professor Emeritus of Poultry Husbandry

Gardner, Willard Professor Emeritus of Physics

Humphreys, L. R. Professor Emeritus of Agricultural Education

Sorensen, C. J. Professor Emeritus of Entomology
Faculty
(Including College, Agricultural Experiment Station, Extension Service, and Branch Agricultural College)

Harris, Franklin S., B.S., Ph.D., LL.D.,
President

Abrams, Milton, B.S.,
Assistant Librarian

Alken, Marian Cushing, B.S., M.S.,
Instructor in Child Development

Alix, Francis, M/Sgt., DEML,
Instructor in Military Science and Tactics

Allen, Bert V.,
Instructor in Photography
Photographic Service

Andersen, E. Milton, B.S., M.S., Ph.D.,
Associate Professor of Vegetable Crops

Andersen, Wendell, B.S., LL.B.,
Assistant Professor of Political Science

Andersen, Stanley P., B.S., M.A.,
Assistant Professor of English and Journalism

Anderson, Roice H., B.S., M.S., Ph.D.,
Assistant Professor of Agricultural Economics and Marketing

Andreason, Jane J., B.S.,
Assistant Librarian

*Arrington, L. J., B.A.,
Assistant Professor of Economics

Ashton, Clarence D., B.S.,
Associate Professor, Extension Horticulturist

Bahler, Thomas L., B.S., Ph.D.,
Assistant Professor of Zoology

Bailey, Reed W., B.S., M.S.,
Director, Intermountain Forest and Range Experiment Station
Non-resident Professor of Forestry

Baird, Glen, B.S.,
Assistant Professor, Extension Agronomist

Banks, Alfred B., Major FA.,
Assistant Professor of Military Science and Tactics

Bateman, George Q., B.S.,
Associate Professor of Dairy Husbandry

Bates, George S., B.S., M.A.,
Collaborator in Teacher Training

Baugh, Bernice Christiansen, B.S.,
Assistant Librarian

Bee, Lawrence S., B.A., M.S., Ph.D.,
Associate Professor of Sociology

Beecher, Asa L.,
Assistant in On-the-Job Training

Beecher, Vern R., B.S.,
Instructor in Automotive Mechanics

Bell, Marvin T., B.S.,
Instructor in Physical Education
Assistant Coach

Bell, William H., B.S., M.S.,
Registrar, Professor

Bennett, James A., B.S., M.S.,
Assistant Professor of Animal Husbandry

*On leave
*Bennett, William H., B.S., M.S.,
Assistant Professor of Agronomy

Berntson, Russell E.,
Executive Secretary and Treasurer

Biddulph, Clyde, M.S., M.Ph., Ph.D.,
Professor of Physiology

Bingham, Golden H., B.S.,
Associate Professor, Extension Irrigation Specialist

Binns, Wayne, D.V.M.,
Associate Professor of Veterinary Science

Bishop, A. Alvin, B.S., M.S.,
Associate Professor of Irrigation and Drainage

Blanch, George T., B.S., M.S., Ph.D.,
Professor of Agricultural Economics and Marketing

Blaser, Glenn F., B.S.,
Veterans’ Coordinator

Bowen, Calvin M., B.S., M.S.,
Associate Professor of Forestry

Boyle, William S., B.A., Ph.D.,
Associate Professor of Botany

Bradford, James C., Lt. Col., QMC,
Assistant Professor of Military Science and Tactics

Brimmer, Marvin L., M/Sgt., DEML,
Instructor in Military Science and Tactics

Brite, J. Duncan, B.A., A.M., Ph.D.,
Professor of History

Broadbent, Dee A., B.S., M.S.,
Professor of Agricultural Economics and Marketing
Assistant Director, Agricultural Experiment Station

Broadbent, Marden, B.S.,
Assistant Professor
Assistant Extension Animal Husbandman

Brough, F. K., B.S.,
Instructor in Bacteriology

Budge, Pearl S., B.S.,
Instructor in English

Buehler, Max
Assistant Librarian

Bullen, Ada, B.S., LL.B.,
Lecturer in Commercial Law

Bunline, Hugh A., B.E.E.,
Assistant Professor of Aeronautics

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Daily 2-5. 8 credits.

90 or 190. Elementary Biochemistry. 3 lectures and 2 labs.
Both sessions. 5 credits. Lectures M.W.F. 9; Lab. M.W. 2-5.

150 or 250. Advanced Inorganic Chemistry. A study based on
the periodic table and atomic structure. A course designed for
Chemistry seniors and graduates and others with similar training.

192 or 292, 193 or 293, 194 or 294. Biochemistry. For senior and
graduate students only. Time and credit arranged.

198 or 298. Research. Senior or graduate students majoring
in chemistry may register for research in any branch of the sub-
ject. Time and credit arranged.

CHILo DEVELOPMENT AND PARENT EDUCATION
Helen L. Porter, Assistant Professor; Oral Pocmire, Marian Aikin, In-
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operate for the benefit of college students who bring their children
and desire a means of caring for them during school hours.
Enrollment, limited to 15 children, will be made up of 2, 3, and
4-year old children. Those students enrolled in Child Development
classes will use the Nursery School as a laboratory for observing
and working with preschool children.

School session: Monday through Friday—8:00 to 11:50
a.m. First session only
Tuition: $5 for 6 weeks
Admission: by application only
Application must be made in writing on or before registra-
tion day. Children will be accepted in order of application.

60s Child Development and Guidance. Growth, development
and guidance of the young child and a study of play materials
which meet the developmental needs of the child from one to
to six years of age. A 9 or 10 o'clock hour must be free each day
to allow for scheduling a daily laboratory hour in the college nursery
school. Class schedules should be checked by instructor before
registration is completed. Four credits. 1 hour lab. arranged
daily. Lectures at 8 daily.

175as. Nursery School Methods. Must parallel practice teach-
ing. Special consideration will be given to understanding the needs
of individual children in the nursery school and evaluating the
principles used in guiding them. Time and credit arranged.

175bs. Practice Teaching in the Nursery School. Open to
qualified Senior students. Check prerequisites with instructor
before enrolling. Time and credit arranged.

CLOTHING, TEXTILES AND RELATED ARTS
Bertha F. Johnson, Professor; Florence Gilmore, Assistant Professor; Mic-
non Perry, Jean Dance, Instructors.

6s. Construction Problems. Open to all college women. First
three weeks only. 2½ credits. Daily 2-5, T. 9-12.
33s. **Home Furnishings.** Open to anyone. Laboratory course including instruction on the following techniques; making of draperies, upholstering, and slip covering. First three weeks only. 2½ credits. Daily 2-4, T. 9-12.

140s. **Decorative Textiles.** Study of historic and modern hand woven textiles. Laboratory work consists of weaving. Prerequisites: Art to satisfy instructor. First three weeks of the first session only. 2½ credits. Sec. 1 Lecture 3 M W Th F, Lab. 9-12 daily. Sec. 2 Lecture 1 M T W Th Lab. 2-5 Daily.

165s. **Tailoring.** Application of techniques used in tailoring women's suits and coats. Prerequisites, clothing and textiles 9, 24, 25, 115 for Home Economics Education and Clothing, Textiles and Related Arts majors. For others sufficient clothing construction to satisfy the instructor. First three weeks only. 2½ credits. Daily 2-5, T. 9-12.

190. **Special Problems.** Time and credit arranged.

290. **Special Problems for Graduate Students.** Time and credit arranged.

210. **Research for Master's Thesis.** Credit arranged.

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**GEORGE B. CAINE, Professor.**


150. **Special Problems in Dairy Production.** Arranged for a limited number of students.

216. **Research in Dairy Production.** Arranged for a limited number of students.

**DAIRY MANUFACTURING**

**A. J. MORRIS, Professor.**

7. **Plant Practice.** Credit arranged.

103. **Cheesemaking.** 5 credits. First session.

105. **106 or 107. Management and Operation.** 2 credits. First session.

154 or 254. **Special Problems.** Credit arranged.

217. **Research.** Credit Arranged.

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140. **International Economic Relations.** Special attention is given basic economic relationship between industrial nations of
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General Information

LOCATION

UTAH State Agricultural College is in Logan, Cache County. The city is a typical college town of 14,000 inhabitants. Highways 89 and 91 intersect at Logan, and the town is served by the Burlington Railways bus line, the Greyhound bus line, 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 provides a full educational offering in the seven schools of instruction. In accordance with the spirit of the law under which it was organized, the College provides a liberal, thorough, and practical education. The two extremes in education, empiricism and the purely theoretical, are avoided; for the practical is based upon and united with the thoroughly scientific. In addition to the practical work of the different courses, students are given excellent training in the sciences, mathematics, history, English, art, music, speech, modern languages, and other related subjects. The object is to foster all that makes for right living, good citizenship, high efficiency, and general culture.

Under this general policy, the special purpose of the College is to be of service in the building of the State and the great West to which it belongs. The instruction in Agriculture, Engineering, Forest, Range, and Wildlife Management, in addition to the purely professional aspects of these fields of study, deals with the special problems relating to the conquest of the great areas of unoccupied lands, the development of engineering structures, the proper use of the water supply, and the kinds of crops or livestock which in Utah and the West may be most profitable. Instruction in mechanic arts points out the most promising trades and teaches them in such a way as to meet the needs of the area. Instruction in Commerce relates to the undeveloped resources and the present commercial conditions of the State, and investigates the principles and methods to be applied in the commercial growth of Utah. The School of Home Economics offers training in the various phases of homemaking and for professional life. In the School of Education students are given the professional training which qualifies them for teaching and school administrative positions.

The Constitution of Utah establishes Utah State Agricultural College and the University of Utah as the two State institutions of higher learning. Each of these institutions is independent in government, although each is a 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 work leading to the Bachelor's and Master'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, the Experiment Station and the Extension Service exist today because of far-sighted legislation which created, stated the purposes, and set forth the fields of activity of these divisions. The Morrill Act of 1862 provided for the establishment of Land-Grant Colleges by the grant
BUILDINGS AND FACILITIES

of Federal lands thus providing a material basis for these institutions. Utah received 200,000 acres. The Second Morrill Act of 1890 carried an annual appropriation to each college; the sum to be spent for instruction in designated fields. Additional Federal legislation increased the financial aid to the institution, including the Hatch Act of 1887 for experimental purposes, the Smith-Lever Act of 1914 to aid in beginning and developing extension work, and 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. It was a democratic movement in education. Participation by the Territory of Utah in the Federal program of education came through the passage of an act "to establish an Agricultural College and an Agricultural Experiment Station." This bill, introduced into the legislature by Representative Anthon H. Lund on February 27, 1888, unanimously passed both houses and was signed by Governor Caleb West, March 8, 1888.

The purposes of the college have been stated in Federal and Territorial acts. 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 sciences of life." The Territorial Act of 1888 affirmed 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." Though the fields of education increased in number and scope and additional subjects were added to the curriculum in harmony with subsequent legislative acts, each president of the college has reaffirmed the purposes as set forth by the Federal and Territorial founders of the school.

The necessary legislation having been enacted to set up the machinery, the next important task was to establish the college concretely. The Lund Act declared the school should be erected "at any place in Cache County that may be designated by the trustees." Logan and Cache County gave the present site of one hundred acres and in 1889, the contract for the south wing of the main building was let to the contractors. Professor J. W. Sanborn of New Hampshire was chosen as director of the Experiment Station, and in 1890, he came to Utah, arriving in Logan in January. The wing of the building was completed, members were chosen for the experiment station and the college staff, and in September, 1890, the college opened its doors to prospective students. President Sanborn, Professors W. P. Cutter, E. S. Richman, John T. Caine, Jr., Abby Markott, A. A. Mills, Jacob Sholl, H. C. Everett, and Sarah Goodwin formed the first faculty. The student body of 1890-1891 totaled 129, many of them being below the college rank of those days.

Since its beginning in 1890, seven presidents have guided the destinies of the college. Following President 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, and President E. G. Peterson in 1916. Dr. Franklin S. Harris, in taking over in 1945, became the seventh president of the institution. From one building in 1890, the number of buildings has reached thirty-eight, plus many temporary buildings of various sizes. The college faculty has grown from 9 in 1890 to nearly 400 in 1948, and the student body has expanded from 129 in the beginning to a cumulative total of the regular school year of 4600 regularly enrolled students in 1947-48. In addition, there were several hundred students in "related instruction" courses.

Seven schools: Agriculture, Arts and Sciences, Commerce, Education, Engineering and Technology, Forest, Range, and Wildlife Management, and Home Economics, provide professional and cultural training. The institution is on the accepted list of the Association of American Universities and the American Association of University Women. In 1929 the name of the college was changed from Utah Agricultural College to Utah State Agricultural College.
FOREST, RANGE, AND WILDLIFE MANAGEMENT


FORESTRY

90. Improvements. Practical field problems in trail and telephone construction; the use of field radios; methods of fire prevention, detection and suppression; care and use of woods tools and horses in Forest, Range, and Wildlife work. Problems in construction, planning recreational areas, and water development. 3 credits. Summer Camp. Floyd and Turner

96. Surveying. Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Type mapping. 3 credits. Summer Camp. Floyd and Turner

97. Forest Practice. Study of timber types and successional stages. Timber cruising, log scaling, inventories and growth of immature stand, stem analysis, taper measurements, sample plots, milling and utilization studies. 3 credits. Summer Camp. Daniel and Bowen

RANGE

98. Range Practice. Field work in range management involving familiarization with vegetation, training in making reconnaissance, methods of studying vegetation and determining utilization. In addition, time will be devoted to range improvement and management planning. 3 credits. Summer Camp. Smith

WILDLIFE

99. Wildlife Practice. A survey of lakes and streams for improvement purposes and for restocking; the use of census methods for big game, game birds, and rodents; rodent identification and study of activities; cover mapping; preparation of animal skins; and study of deer and elk ranges. 3 credits. Summer Camp. Kelker and Sigler

FORGE PRACTICE

J. DONALD WADSWORTH, Instructor.

113. A. E. Farm Machinery Repair. Applied problems in farm machinery repair and maintenance. Prerequisite: Forging 81a, and Welding 96, or equivalent. Three credits. First session. Wadsworth

11b. F. P. Forge Practice. Fundamental operations of forging, such as shaping, bending, punching, hardening, tempering, and forge welding. Prepares students for forging jobs in repair shops, construction camps, and industrial maintenance shops. Excellent training for metal workers entering present-day industries. Three credits. First session. Wadsworth

GEOLOGY

J. STEWART WILLIAMS, Professor.

1. Introductory Physical Geology. A general survey of the whole field of physical geology for arts students and others who
A companion building to the Field House, completed in 1940, is the Military Science Building, located just to the east with a corridor connection between the two. This brick-concrete structure, 50 feet by 180 feet, is provided with excellent offices, classrooms, rifle ranges, gun and equipment supply rooms. A large gun shed is part of the building. Because of its association with the Field House, military training the year round is greatly facilitated.

The Extension Service Building, one of the older buildings, is a two-story brick structure. It was originally occupied by the Experiment Station Staff. Since the Extension Service became an important function of the institution, this building has been occupied by the Extension staff, and is now the headquarters of a state-wide educational service organization, maintained by the College and Federal Government jointly.

Widtsoe Hall, a three-story, brick-concrete building, was constructed in 1915. It is wholly occupied by the Departments of Chemistry, Physics, and Experiment Station Laboratories. All classrooms are well lighted and heated, and provided with desks and equipment for teaching demonstrations and experiments. Chemical and Physical laboratories are furnished with ample facilities, and are wanting to prepare for student training and research in these fields.

The Animal Industry Building, a three-story, brick-concrete structure erected in 1917, is occupied by the departments of Animal Husbandry, Poultry Husbandry, Dairy Industry, and Vegetable Crops. The building is well equipped with laboratory and classroom facilities for the study and teaching of dairy manufacturing, animal and poultry nutrition, breeding and wool technology. A modern cheese, butter and ice cream manufacturing plant occupies part of the building, which is used for practical training in dairy products manufacturing. Facilities for teaching and research in animal nutrition have recently been expanded.

The Plant Industry Building is a brick-concrete structure of four stories, erected in 1917. It is modern in design and arrangement, and houses the departments of Agronomy, Bacteriology and Public Health, Botany and Plant Pathology. Located in this building, also, is the large Intermountain Herbarium, located on the fourth floor. All the departments are provided with well-lighted classrooms and laboratories.

The Engineering Building, a modern, four-story, brick-concrete structure, also erected in 1917, was well planned for its special purpose—training in engineering work. The School of Engineering and Technology has its headquarters here. In this building, all the college work in Civil Engineering, including Surveying, Mechanical Drawing, Hydraulics, Irrigation and Drainage, Municipal and Agricultural Engineering, is taught. This building houses the Hydraulics, Irrigation, Soil Mechanics, and Agricultural Engineering Laboratories, all of which are modern and well-equipped. The Drafting rooms and the Design Laboratories are also housed in this building.

The Mechanic Arts Building, housing shops of the School of Engineering and Technology, located south of the Main Building, is another of the older buildings. To keep pace with rapidly expanding demands for training in automotive, radio aeronautical mechanics, the building has been extensively re-modeled and additional floor space provided. It now houses all shops and laboratories on the campus used for the work in the technology of Air Conditioning, Auto Mechanics, Forging, Industrial Education, Radio and Machine Practice, Electronics, Sheet Metal, Welding, Woodwork and Building Construction. Laboratories, classrooms, shops, radio and sound recording rooms used in these several fields, are adequately equipped to give complete training to students wanting to prepare themselves for the skilled technical trades and for service as technicians in industry. Much new equipment has been added to the shops during the past five years.

The Library Building constructed in 1930, academic and cultural center of the College, is located on the east side of the quadrangle. Space is provided for a Children's Library in connection with a beautifully designed special reading room for under-college age groups. The departments of English and History use the top floor for their classes because of convenient access to library stacks.

The Forestry Building, located on the northwest corner of the campus, is another of the older buildings. A four-story, brick structure, in the olden days it was originally a girls' dormitory, and later the home of the School of Home Economics. Rearranged when the Commons and Home Economics Building was
completed, it houses the School of Forestry. Thorough and technical training in the departments of Forest, Range and Wildlife Management is provided. Its classrooms, laboratories and specimen museums are provided with equipment and all facilities for complete training in these important fields of national resources. 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.

A Child Development laboratory occupies a residence north of Widtsoe Hall. In connection, outdoor space well supplied with playground equipment is available. The School of Home Economics has a Practice House of excellent appearance and facilities just west of the campus.

Lund Hall, a fire-proof, air-conditioned dormitory located south and east of the Library, provides modern accommodations for 200 freshman women. Life in the Hall generally is both comfortable and pleasant. Bed linen is provided and laundered by the College.

Kerr Hall, converted from a large residence, houses 46 upper-class women in home-like style. Bed linen is provided and laundered by the College.

Anticipating a permanent Union Building, students began in 1946 to enjoy the recreational facilities of a temporary Union Building east of the Library. A structure formerly used for military training was converted for this use.

College greenhouses comprise eight complete units which cover 15,875 square feet of planting space. Head houses in connection furnish room for laboratory, storage, and sorting needed for student training and research in plant breeding and propagation in horticulture, floriculture, vegetables, grains and grasses. During the past year a new greenhouse was constructed for virus disease studies.

The College barns are suitable for the care of cattle, horses, sheep and swine with ample storage for feeds. In the College-owned herds are various pure-breeds of livestock common to the intermountain region. An experimental Holstein herd is maintained and operated by the College and Experiment Station on a modern dairy farm located at North Logan, one mile north of the campus. All livestock owned by the College is maintained largely on College-owned property which adds greatly to the facilities of training students in livestock feeding, breeding, care and management practices.

A Stock Judging Pavilion makes it possible to do stock judging under comfortable conditions at all seasons.

The Poultry Plant, built on the colony plan, is equipped for class and experimental research work in poultry husbandry. Among the College flocks are all the 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 in poultry to obtain the most economical production.

The Veterinary Science Building, a one-story brick-concrete structure, 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. The building is equipped for research and clinical work in Veterinary Science and animal diseases.

Construction of 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.

The main College heating plant is located in a central boiler house. Heat is supplied to the buildings by means of steam through distribution lines in tunnels. Extensive enlargements and improvements completed in 1949 greatly increased the capacity of the plant.

Laboratories

The College laboratories for Animal Breeding, Animal Nutrition, Bacteriology, Botany, Chemistry, Engineering and Technology, Entomology, Farm Crops, Geology, Home Economics, Mineralogy, Physics, Physiology, Plant Pathology, Soil Physics, Wool and Zoology are provided with satisfactory working conditions. The equipment is generally complete, and extensive experimental
research is carried on by the faculty and advanced students in many scientific fields. Recent acquisitions of importance include an electron microscope, a spectrograph, and an ultra centrifuge.

College Libraries

The Libraries of the College consist of the main Library and five branches. The Moore Library, one of the oldest of the branch libraries, is housed in the main library building. It is devoted primarily to children's literature and primary and secondary educational material. Here, also, is kept the Carnegie music collection which has been supplemented by the College and now contains some 4,000 records. The Home Economics Library is housed in the Home Economics building and is specific to the School of Home Economics. The Hatch Memorial Collection, which contains a number of rare books on architecture and interior design, is shelved here. The Engineering Library, housed in the Engineering Building, includes all of the books, magazines, documents, specific to the fields of civil engineering, mechanical engineering, agricultural engineering, and the various phases of technology. The Commerce Library, which is in the Main Building in the School of Commerce, includes books, magazines, and documents specific to the departments of business administration, commerce, secretarial science, and related fields. The Forestry Library, in the Forestry Building, contains books relating to forest, range, and wildlife management.

The Claypool Map Collection is maintained in connection with the Geology Department.

All of the material in all of the branch libraries is recorded in the master catalogue and indexes of the main Library, making all material accessible to research workers on the campus. Utah State is a depository for the Superintendent of Documents. All documents coming from the Federal Government are classified, cataloged, shelved, and made available to the public. The College is a complete depository for all government documents. The libraries receive by subscription and gift approximately 1,300 current journals and newspapers. The book collection numbers 132,000 representing practically every field of learning.

The Library is open to students, faculty, and residents of the State of Utah, practically every day in the year except legal holidays. The books 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. The 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 popular investigation and descriptive treatment. From time to time the results of the herbarium researches are released as technical articles published in scientific journals or economic and popular bulletins and circulars released by the Utah Agricultural Experiment Station.

Most of the species that grow in Utah and the Intermountain Region are represented in the herbarium.

The herbarium is likewise the depository of a branch of the College Library, consisting of literature dealing with floristic botany and descriptive taxonomy.

Graduate work in plant taxonomy offered by the Department of Botany utilizes the adequate 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 will be provided by the herbarium staff. Requests for information or plant identification should be addressed to the Curator of the Herbarium.
Student Organizations

Government and Traditions of the Student Body Organization

The Associated Students of Utah State Agricultural College is an organization which embraces all students of the Institution. Its prime object is to foster a proper spirit of college loyalty, and to give the students practice in managing public affairs. It also secures efficiency, as well as uniformity, in administration of matters pertaining to the entire student body, and encourages all students to participate in college activities. A point system of awards to recognize participation in all non-athletic activities encourages high scholarship during participation by means of graduated bonuses for higher scholarship. The organization provides each member with proper athletic, theatrical, and social recreation at low cost. This organization cooperates with faculty representatives. Students may participate in the following activities:

   An intramural program, including all seasonal sports for which awards are given, is conducted.

2. Musicals, including all public performances of the band, the orchestra, and musical clubs. These organizations present several concerts during the year and each group usually tours some part of the surrounding area.

3. Theatricals. There is great activity in the field of the drama, and numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting. The performances of recent years have been of high quality.

4. Opera. Each year the Music Department produces an opera. With successful performances of such works as Rigoletto, Faust, Aida, Il Trovatore, Carmen, Student Prince, and Blossom Time, the annual production of an opera or operetta has become traditional.

5. Debating and Public Speaking. Debating is extremely popular, drawing approximately 30 participants each year. The College is a member of the Rocky Mountain Forensic League and each fall meets schools of this group in debate, oratory, extemporaneous speaking, after-dinner speaking, and panel discussion. Participation in the Utah-Idaho Junior College Forensic League and in debate tournaments on the Pacific Coast provides ample opportunity for experience in tournament debating. Intra-state debates are held in the form of a state legislature.

6. Student Publications. The students publish a weekly paper, "Student Life," a yearbook, "The Buzzer," and a quarterly magazine, "Scribble," which are distributed to all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's "Juniper."

7. Lyceum Course. The Lyceum presents numerous national and international figures.

8. Dances and Entertainments. At regular intervals, the Student Body organization sponsors all-college dancing parties, informal and formal in nature, and regular assemblies which provide extensive expression for student talent. Students with talent and interest in such participation should register with the Student Public Service Bureau.

9. Associated Women Students comprises all women students registered at the College. Its purpose is to unite the women of the College and encourage activity of women in campus affairs and development of talents.

Organizations

More than one hundred clubs, societies, and professional organizations are established on the campus. There are also seven chapters of national fraternities and five chapters of national sororities. All of these organizations are officered by students.

Foreign Students

Since the war the number of students from foreign lands has increased. Special adjustments have been made to help meet their needs in English and
Speech work and other activities. The Cosmopolitan club for both foreign and American students is active.

In 1949 the following countries were represented at USAC: Belgium, Burma, Canada, Chile, China, Colombia, Egypt, Honduras, Iceland, India, Iran, Iraq, Lebanon, Mexico, Palestine, Peru, Puerto Rico, Syria, Trans-Jordan, and West Africa.

Assemblies

A general assembly is conducted each week in the main auditorium. A joint student-faculty committee plans the assemblies, which consist of lectures, debates, dramatic presentations, concerts, and activities selected for the enlightenment, cultural development, and entertainment of the students. The 11 a.m. hour Tuesdays has been set aside for general assemblies.

The faculty has voted to schedule no regular classes at 11 a.m. Thursdays that would interfere with the mass reviews of the Military Science and Tactics Department, which are conducted at that hour.

U. S. A. C. ALUMNI ASSOCIATION

W. W. Gardner, President
D. A. Skeen, Past President
Leonard W. McDonald, Executive Secretary and Treasurer,
Director, Division of College Development and Alumni Relations.

The Utah State Agricultural College Alumni Association was organized on June 13 and 14, 1899, by Alumni who met on the campus and formed the Association. At that time there were 44 members. The Association has shown consistent and rapid growth until it numbers more than 9,500 graduates and approximately 51,000 former students who did not obtain degrees.

The graduates of Utah State Agricultural College have achieved outstanding prominence in every walk of life and every state in the nation. Aggie alumni in large numbers served in the late war, and an exceptionally large number of these men and women held or are holding high commissions in the military and naval forces.

Purpose. It is the purpose of the Association, (1) to form and strengthen friendships among the Alumni; (2) to foster feelings of gratitude and love for the College; (3) to establish beneficial relationships between the Alumni and the College; (4) to promote the interests and welfare of the College and its Alumni; (5) to represent the interests of the Alumni in the welfare, standards, and advancements of the College; and (6) to serve as a representative of graduating classes after they have left the Campus.

Membership Any person who has attended Utah State Agricultural College one quarter or more may obtain membership in the Alumni Association by making application to the Alumni Executive Committee. All persons receiving degrees, diplomas or terminal vocational certificates from the College automatically become members. Sustaining membership in the Association may be had by parents of graduates or students or by others who have shown an interest in the College or the Association, upon the payment of annual dues of five dollars. Persons not eligible for regular membership in the Association, but who have done some outstanding service to the Institution are eligible for honorary membership, and may become honorary members upon recommendation of the Executive Committee, and upon being accepted by the Alumni Council.

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

Government. The governing power of the Association is vested in the Alumni Council composed of fifteen elected members, and ex officio members. From this group, a president and four executive members are chosen. The president and the executive committee select the Executive Secretary and Treasurer of the Association when that position is declared vacant. The Alumni Executive Sec-
retary is the official representative of the Association on the Campus. Senate Bill 90, passed by the 26th session of the legislature and signed by the Governor March 15, 1945, makes the president of the Alumni Association an ex-officio member of the Board of Trustees of the College.

**Function.** Besides maintaining a complete record of each alumnus after graduation, two special projects have been originated and sponsored by the Alumni Association—the Library Endowment Trust Fund and the Life Membership Fund. Earnings from the former fund, accumulated from popular subscriptions, 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.

The principal from the Life Membership Fund has in the past been loaned to worthy students to aid them in finishing their college work. Interest from the loans is used to support the Alumni Association.

The Association serves as a parent organization for several active chapters in Utah which each year sponsors dinner meetings and parties for alumni and former Aggie students in their respective areas.

Since September, 1925, the Alumni Association has published the Utah State Alumni Quarterly, a magazine appearing four times each year and devoted to keeping Alumni members informed of each other's doings, and to maintaining a strong relationship between the Alumni and College. In March, 1949, this publication was replaced by the Utah State Alumnus which is issued nine times a year.

The Board of Trustees of the College have by formal action created the Division of "College Development and Alumni Relations" which the Alumni Secretary heads. It is anticipated that the establishment of this division of the College will open up avenues of service and support for the College by its Alumni members.

Preparations are being made to launch an annual fund campaign, the first goal of which will be $50,000 to be used in helping to furnish the Student Union Building when it is completed.

**"A" MEN'S ATHLETIC ASSOCIATION**

_Cantril Nielson, President_

_Glen Worthington, Secretary-Treasurer_

The purpose of this organization is to foster a sound and healthy spirit of cooperation 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-winning athletes to the end that athletics at Utah State shall be conducted on a high plane, ethically and otherwise.

The "A" Men's organization provides a means whereby aid and assistance may be rendered the College in building and maintaining a sound athletic program. In the past, the organization has each year awarded a scholarship in an amount equal to the resident tuition to a deserving athlete, either resident or non-resident of the state. Other scholarships are gradually being made available through the work of the "A" Men's group.

**PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE**

The Professional Relations and Faculty Welfare committee has been authorized by the Board of Trustees and the Administration and elected by the Faculty to represent the Faculty on matters pertaining to professional relationships and welfare. A principal duty of the Committee is to cooperate with the Administration in the development of standards, policies, and programs on Faculty professional relations and welfare, leading to better understanding and improving the relationships among the Faculty, Administration, students and other groups.
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 Extension Service, including the Correspondence and Extension Class Work; (5) the Summer Session; and (6) the Branch Agricultural College at Cedar City. The academic regulations apply to all instructional work of regular session, summer session, correspondence and extension study.

Admission

Prospective students are urged to send official transcripts 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) upon presentation of fifteen approved high school units of work or (c) by examination of those students eighteen 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 of the type which might otherwise have resulted from attendance in a regular academic 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 will be 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 eighteen years of age may not enter with a high school deficiency.

The following suggestions are designed to 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. The 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 would be 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 the 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 adviser should plan the high school program of studies 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 who do have, list them in their school and departmental section in the 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 will not be 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 evaluation become the property of the Institution, and will not be returned. Transcripts should be sent to the Registrar four weeks in advance of registration. It is necessary to have them at the time of registration, in order 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 advisement, 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.

Acceleration toward the degree may be obtained by submitting records of formal and informal educational development somewhat equivalent to that which might have been expected from college study and by taking tests of such development. Credit will be given for training received in military service when such training meets the standards of the Institution and is equivalent to courses offered in the Institution. Review and short refresher courses will also be given when found needed.
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 135 credits for Senior rank. The foregoing figures include the required credits in Physical Education or Military Science.

Registration Dates: For the Fall Quarter students will register on Thursday, Friday and Saturday, September 22, 23, and 24. Classes will begin Monday, September 26.

For the Winter Quarter, all students will register on Monday, January 2. Classes will begin Tuesday, January 3.

Registration for the Spring Quarter will take place on Monday, March 20. Classes will begin Tuesday, March 21.

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

Late Registration: Registrations after the last date given above for each quarter are considered late. A fee of one dollar per day is charged for those who register late, with a maximum fee of five dollars. In case the registration cannot be completed by the prescribed day, owing to some delay caused by the College or its officers, an exemption may be obtained upon application to the Registrar on the regular day of registration. The amount of work for which any student is allowed to register is reduced by one and one-half credits for each week or fraction thereof that a student is late in registering

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

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

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 in question.

No student will receive credit for residence work not included on his registration card, which must be filed in the Registrar's Office before the end of the quarter. 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 is allowed for such attendance.

All male students are required to take six quarters of basic military science and tactics, unless exempted because of previous military service, physical disability, or other sufficient reason. This work is taken in the Freshman and Sophomore years.

Withdrawal From Classes: The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's Office, is considered as 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 end of the quarter, F grades will be recorded in case of failure to obtain passing grades in any of the courses for which the student has registered, regardless of the reason for the failure. During the first seven weeks of any academic quarter, a student may withdraw from a class on his own initiative with the consent of the instructor and his dean.

After the beginning of the eighth week of any academic quarter, withdrawal from a class is permitted only with the approval of the Attendance and Scholarship Committee. A petition initiated by the student shall be taken by him to his adviser, who will obtain the comments of the class instructor and of the
The adviser will forward the petition, together with a summary of the facts gleaned from the student, the dean, and the instructor, to the committee. The student may be requested to appear before the committee.

**Incomplete Work:** Students must complete by the end of the quarter all courses for which they have registered. Incomplete grades can be granted by an instructor only when permission is granted by the Attendance and Scholarship Committee before the close of the quarter. Necessary petition forms may be obtained at the Registrar's Office.

Incomplete work must be finished, and a passing grade given in the course, within one year of the close of the quarter, otherwise the credit is forfeited.

**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 contemplate 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 20 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 the first quarter for which a student enrolls in any given school year, the credits gained will be included as part of the student's load for the quarter.

Petition should be made to the Committee on Special Examination on special 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.

Residence credit shall not be given for off-campus study without special permission of the Deans' Council.

**Low Scholarship and Probation.** Students who have not maintained an average grade of C or better and students failing to obtain passing grades in 12 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 are 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 Attendance and Scholarship Committee. This Committee, alone, has the authority to waive or modify the 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.

**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 will not be allowed to enter Upper Division courses except upon approval of the Dean or Adviser and the instructor of the course.
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.

Provisions are made in several departments of the College for the issuance of Certificates of Completion for two years of work as prescribed by such 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 special placement examination in English is required of all freshmen.
   2. Freshman students in the School of Engineering and Technology and in the School of Forest, Range, and Wildlife Management are required to complete English 17, 18, and 19. Students who start this series should continue throughout the three quarters, even if they transfer from Engineering or Forestry to other schools.
   3. All other students are required to complete English 10 or 11 in the sophomore year.

Note: For graduation all students must present nine credits in English Composition (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. Botany 1 or Zoology 1, and any lower division Bacteriology course, 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. Zoology 2 and Botany 25, or any lower division Bacteriology course.
Students who already have a satisfactory knowledge of general biology, as demonstrated by examination, may satisfy this group requirement by taking Physiology 4 and any lower division Bacteriology course.

2. Exact Science.
   Chemistry—any course of Lower Division grade.
   Geology—any course of Lower Division grade.
   Mathematics—any course of Lower Division grade.
   Physics—any course of Lower Division grade.

3. Language and Arts.
   Art 1, 2, 3, 22, 26, 32, 33, 35.
   English—any literature course of Lower Division grade.
   Landscape Architecture 3.
   Language—any beginning course in French, German, Portuguese, Spanish or Latin.
   Music 1, 4, 5, 11, 12, 13, 80, 81, 89.
   Speech—any course of Lower Division grade.

4. Social Science
   Agricultural Economics 53a, 53b, 62.
   Economics 51, 52.
   History—any course of Lower Division grade.
   Psychology 53.
   Political Science 1, 10, 70, 71.
   Sociology 10, 70.

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 (see Military Science and Tactics).

In departments where there is a prescribed course of study such as in Forestry; Smith-Hughes Teacher Training courses; and in Engineering and Technology, the completion of such courses shall substitute for the group requirements, provided the student remains in that field.

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 will substitute for the completion of the group requirements at this institution, as prescribed in the section of the Lower Division. 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 Subject: The student should select a major subject upon entering, or early the first year, but in no case later than entrance in the Upper Division. As soon as the major subject has been selected, the student should contact 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-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. The requirement that at least one quarter (at least 12 credits) of the Senior year must be done in residence at this Institution is waived for such students.

Students who pursue the Nursing course at the College and the cooperating hospitals need not comply with the formal major-minor requirements if they complete the prescribed program in Nursing.

Minor Subject: 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 freshman orientation requirements as specified under the Lower Division cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation

The College offers Certificates of Completion for two years of applied work 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 the 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 sciences underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in both the Lower and Upper Divisions.

The general requirements for this Certificate are:

1. Satisfy the entrance requirements.
2. Complete 96 credits, which includes 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 field. This need not be in the same school.

5. Complete 24 credits in the basic groups, as follows: Language, nine, which shall include English 10; Exact Science, five; Biological Science, five; and Social Science, five.

6. Complete 21 credits of elective work.

Only Lower Division credit may be obtained for work taken during the short course, even though some Upper Division courses be taken.

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 as 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 will be 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 in the spring of 1950, the following requirements must be met after satisfying the requirements for admission. The 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 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 145-10.

3. One hundred eighty credits of acceptable collegiate work, exclusive of the required credits in Physical Education or Military Science.

4. Fifty-four credits of Upper Division work taken after the candidate has presented at least 90 college credits, in addition to the required courses in Military Science and/or Physical Education or their substitutes.
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 the English composition requirements, English 110, or its equivalent, as explained under Lower Division requirements.

Paragraphs 5 and 6 above do not apply to students who are pursuing a prescribed course of study such as in Forestry, Smith-Hughes Teacher Training courses, Engineering and Technology.

7. Each school of the College, subject to faculty approval, shall determine the nature and amount of extension credit accepted for admission and toward graduation with a Bachelor's degree. In no case shall more than 50 percent of the credit submitted for graduation be non-residence credit, including special examination, extension and home study credit. This 50 percent may include one-half home study credit.

8. Applicants for degrees having 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 have studied in residence at Utah State Agricultural College during three full quarters, a full quarter being a quarter in which at least 12 residence credits are earned.

The Graduation Committee may accept an equivalent amount of part-time residence credit in fulfillment of this requirement where recommended by the department and school concerned. The committee may waive 12 credits of the residence requirements in cases in which the department, the school, and the committee consider that the purposes of the requirement have been fulfilled otherwise.

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. The maximum number of "D" grades counting as credits shall be 36 credits.

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 each credit of "D." A deduction of one grade point will be 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 "P" have been assigned. Credits of "D" 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 must file an "Application for Graduation" with the Graduation Committee not later than the first day of the winter quarter, containing information requested. Any candidate who fails to file his application for graduation by the first day of the winter quarter, may be held over to the next year's commencement.

13. The candidates must be of good moral character and must have discharged all college fees.

14. Attendance in person at the Commencement and Baccalaureate exercises at which the candidate expects to secure the degree is mandatory, unless excused in writing by the Graduation Committee for very urgent reasons upon petition from the student.

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 Department.
THE Graduate School is organized to serve the educational needs of men and women who have completed their undergraduate work and who desire to qualify themselves further for professional services, or who may wish to identify themselves with a program of higher education leading to a teaching or research career on the college or university level. In all advanced work, effort is made to bring the student into direct contact with the basic research and teaching activities in his chosen field to the end that he may obtain a comprehensive view of a specialized field of knowledge together with the training essential for effective teaching or independent investigation. In graduate work the aim is to achieve a high standard of scholarship rather than to fulfill routine course requirements.

Departments that offer graduate work in related fields or in natural educational areas cooperate (1) to determine the needs for graduate work or training within the areas; (2) to provide fundamental and basic course work or training within the areas; (3) to foster the spirit of scholarship and research and to determine standards of achievement appropriate for the areas involved; and (4) to promote institutional standards and give institutional character to graduate work beyond that which is made possible by independent departmental direction.

Graduate work in the College is directed by a Graduate Council, which consists of the Dean of the Graduate School and seven members of the faculty appointed by the President. The scope of the Graduate school covers all graduate study in the College.

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 the College who have an average of a "B" or better in all their courses in their 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 for a limited amount of graduate work. All such courses selected for graduate credit must be approved in advance by the Head of the Department and by the Dean of the Graduate School. Graduate credit will not be allowed if the student's total credit for which he is registered during the quarter exceeds 16 hours.

Students are admitted to graduate studies in social work who have taken a Bachelor's Degree with: (1) a major in social work; (2) a major in sociology, economics, political science or psychology, and have a total of not less than 36 credits in these four departments; or (3) a major in child development, physical education, public health or education, and who also have 25 credits in one of the four social sciences above listed with a fair balance among them. Students over 35 years of age are admitted only by special arrangement.

Admission to the Graduate School does not imply admission to candidacy for an advanced degree. Such admission is granted by the Dean of the Graduate school only on a recommendation of the Head of the Department and of a special examining and advisory committee as explained below. All students registering in the Graduate School must have their registration card signed by the Dean of the Graduate School. Students who wish to register in the Graduate School should submit their application at least one month before the opening of the quarter in which they plan to matriculate. In all cases, students who are not graduates from the Utah State Agricultural College must provide a certificate of graduation and a transcript of credit taken in other institutions. If his transcript of credit does not accompany the application, a date should be specified at which transcript will be provided. Blanks for making application can be had from the Registrar's office or from the office of the Graduate School.
MASTER'S DEGREE

All approved graduate courses in the College lead to the Master of Science Degree. Majors for the Master of Science degree are offered in all the basic biological, physical, and social sciences, and in the various educational, industrial, and professional divisions of the college. The specific departments, or groups of departments (over 30 in all) in which the Master of Science degree is given, together with the course service provided by the departments, may be determined by consulting the departmental statements provided in the catalog under the various undergraduate schools of the College.

Requirements and Procedures for Obtaining A Master of Science Degree

1. Acceptance for Registration as a Candidate for a Master of Science Degree. A student who has been registered in the Graduate School for one quarter, and who has satisfied the Department in which he proposes to do his graduate work, may be admitted to candidacy for a Master of Science degree upon the recommendations of the appropriate area committee or of the Head of his Department and of a special examining and advisory committee appointed by the Dean of the Graduate School. All students wishing to become candidates for a Master of Science degree will apply directly to the Graduate Dean. Application blanks are available at the Office of the Dean.

2. Major Professor and Thesis Director. The applicant will be assigned by the Dean of the Graduate School to a major professor, who in all cases will be a member of the teaching staff of the Department in which the student has chosen to do his major work, and who will be chosen in consultation with the student and the Head of the Department involved. The Major Professor will advise the student in the planning and in the prosecution of his course of study and in his research work, and will function as chairman of the student's Advisory and Examining Committee. The Major professor will be aided by an Examining and Advisory Committee consisting of himself as chairman and at least three other members chosen from the faculty of the Major Department or closely related Departments. A fifth member, completing the committee personnel, may be chosen from the faculty of the English Department. The committee is responsible for all examinations dealing with the candidate's work.

In instances where the thesis chosen by the applicant is based on research best directed by personnel in another department or supported by the Experiment Station or by Federal or outside agencies, the applicant, with the advice of the Major Professor and the Head of the Department, may be assigned a special Thesis Director. This Thesis Director need not be a member of the teaching staff or of the Major Department in which the student is majoring. The Thesis Director will become a member of the student's committee, directly responsible for the student's research and thesis, and will function in this connection with the Major Professor in directing the student's educational program. The Dean of the Graduate School and the Head of the Department in which the student is specializing are ex-officio members of all committees and advisory groups.

3. Qualifying Examinations and General Requirements. By study of the records of the student's scholastic work, by use of available departmental examination and by special examination, both oral and written, the advisory and examining committee shall satisfy itself as to the adequacy of the student's preparation and advisability of his pursuing graduate work.

No student is admitted to candidacy who has not received an average of "B" grade in his junior and senior years of undergraduate studies and who has not completed at least one quarter's work in residence with an average of "B" or better. Exceptions may be made where it is shown by the Department that the student has special aptitudes not adequately indicated by his scholastic record.

4. Program of Study. If the Advisory Committee is convinced that the preparation and ability of the applicant are such as to give reasonable assurance of success in advanced studies, then the committee under the direction of the Major Professor shall, with the applicant, plan a program of study which will
meet all requirements for the Master of Science degree. This program must include:

(a) At least three quarters of residence. Where courses are critically chosen, four summer sessions with residence research culminating in a thesis may be accepted as fulfilling residence requirements. Under no condition will extension credit or credit transferred from other institutions be permitted to shorten the period of residence.

(b) At least 45 credits including the thesis in courses numbered 100 or over approved for graduation in addition to any lower or upper division courses which may be necessary to strengthen the undergraduate preparation in his major and minor subject. Under no condition will more than 16 credits be allowed for any one quarter with 12 credits as a maximum for one-half time. All courses allowed toward a Master of Science degree must be completed with a grade of "B" or better.

(c) At least ten credits conclusive of work connected with the thesis in courses numbered 200 or above.

(d) A thesis with 9 to 15 credits. All courses allowed toward graduation shall be in the major department or closely related fields and must be completed with a grade of "B" or above. Under no condition will more than 16 credits be allowed in any one quarter with 12 hours as a maximum for students on a one-half time basis.

Any modification of these requirements necessitating action of the Dean of the Graduate School will be considered only if they are submitted by the chairman of the applicant's advisory committee and as part of the student's entire proposed program of study.

The candidate will submit his proposed programs of course study and research and make application to the Dean of the Graduate School on blanks provided at the office of the Dean of the Graduate School. This application must be accompanied by a critical statement of the student's thesis and by a general plan of his research procedure.

5. Time Limitation for Application. Application for admittance to candidacy must be made before the student has completed more than one-third of the credits allowed toward his Master's Degree. The application should be submitted by the end of the first six weeks of the quarter preceding that in which he completes his work and is to be graduated. In no case will application be honored later than the last week of this same quarter.

Notice of admission to candidacy, together with a letter of instructions concerning the thesis form and final examination, will be sent to the candidate by the Dean. A form on which to make application for graduation will also be enclosed with the letter. This form calls for the payment of a fee of $10 for official checking and binding of two copies of the thesis.

Thesis

Each candidate for a Master of Science degree 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. In all cases, the thesis must represent 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, together with a critically written abstract 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. The type written copy and the first carbon copy of the final draft, properly signed by the Major Professor, the Head of the Department, a Representation of the Library, and the Dean of the Graduate School, must be submitted to the College Librarian to be deposited in the Library of the College one week prior to date of graduation. If the student is to be graduated at the June commencement, the thesis must be submitted in its final form by May 20 preceding commencement.
Final Examination

Each candidate for a Master of Science degree will be 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 will be 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, will be appointed to act as chairman of the examination and will submit 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 not be later than April 3. When the examination is passed and the thesis submitted and deposited with the Librarian, the Dean of the Graduate School will present the name of the candidate to the College faculty for approval. He will also instruct the candidate regarding attendance at commencement and on other matters relating to his graduation.

Time Limit for Completing Work for a Master's Degree

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 Courses

The amount of extension credit to be allowed will be determined in consideration of the students entire course program. In no case will more than nine quarter hours of extension credit be allowed as counting toward a degree. 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 will not be 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 Advisory and Examining Committee subject to the approval of the Dean of the Graduate School and the Graduate Council. In no case will graduate credit received in other institutions be transferred either for credit or in lieu of residence until the student has satisfactorily completed at least 16 credits in residence at the Utah State Agricultural College.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The College offers advanced training leading to a Degree of Doctor of Philosophy in a limited number of fields. With its cooperative connections with the various state and federal research agencies, the College is well equipped to maintain its leadership in the field of irrigation and drainage, in soil physics and in various other phases of soil science and related fields.

More detailed information may be obtained from the Dean of the Graduate School.

Graduation at Close of Summer Session

All students who satisfy the requirements for graduation by the close of the Summer Quarter are listed with the class of the following year and will receive their public graduation at the following Commencement. The graduation of such students however, will be certified by the proper authorities of the College as soon as their work is completed.
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 $675 for one-third teaching service on a nine-month basis. Remuneration for research assistantships may vary from $675 to $1,200 dependent upon the time of service involved. All assistantships are arranged so as to allow the student to complete work for his Master's Degree in two years. At the present, assistantships are available in the following departments: Agronomy, Soils, Soil Physics, Animal Husbandry, Bacteriology, Botany and Plant Pathology, Biochemistry, Chemistry, Dairy Manufacturing, Economics, Education, Agricultural Engineering, Civil Engineering, Engineering and Technology, Physiology, Foods and Nutrition, Child Development, Zoology and Entomology.

STUDENT EXPENSES

Resident Students

Three Winter Only Winter Spring
Quarters and Only Only
Registration Fee $10.00 $10.00 $10.00 $10.00 $10.00
Tuition 51.00 34.00 17.00 17.00 17.00
Student Body 12.00 9.00 6.00 6.00 6.00
Athletic Fee 6.00 4.00 2.00 2.00 2.00
Class Fee 1.00 1.00 1.00 1.00 1.00
Building Fee 20.00 14.00 7.00 7.00 7.00

$100.00 $72.00 $43.00 $43.00 $43.00

If a resident wishes to attend all three quarters but pay fees on a quarter basis, the payments are divided as follows: Fall, $43; Winter, $29; Spring, $28; making a total of $100.

Non-Resident Students

Three Winter Only Winter Spring
Quarters and Only Only Only
Registration Fee $10.00 $10.00 $10.00 $10.00 $10.00
Non-Resident Fee 105.00 70.00 35.00 35.00 35.00
Tuition 51.00 34.00 17.00 17.00 17.00
Student Body 12.00 9.00 6.00 6.00 6.00
Athletic Fee 6.00 4.00 2.00 2.00 2.00
Class Fee 1.00 1.00 1.00 1.00 1.00
Building Fee 20.00 14.00 7.00 7.00 7.00

$205.00 $142.00 $78.00 $78.00 $78.00

If a non-resident student wishes to attend all three quarters, but pay fees on a quarter basis, the payments are divided as follows: Fall, $78.00; Winter, $64.00; Spring, $63.00.

In addition students are required to pay a Materials and Laboratory Fee each quarter which varies with the respective schools according to the following schedule:

Agriculture $4.00 Forest, Range and Wildlife $4.00
Arts and Sciences 3.00 Management
Commerce 2.00 Engineering and Technology 5.00
Education 2.00 Home Economics 3.00
FEES

The fees listed above with the exception of the Associated Students (Student Body) fees are the minimum fees required by State law. According to an act passed by the Legislature, all legal residents of Utah who enter the College must pay a registration fee of $10, and, in addition, they must pay a tuition fee of $17 per quarter. Students who are not legal residents of the state are required to pay a registration fee of $10 per year, plus a non-resident fee of $35.00 per quarter, in addition to the tuition fee of $17 per quarter.

**SPECIAL FEES—1948-49**

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<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Special Students—Registration fee</td>
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<td>Plus $2.50 per credit hour (maximum 6 credits)</td>
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<tr>
<td>Chemistry Laboratory deposit</td>
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<td>Bacteriology 2, 71, 105, 107, 110, 120, 130, 160, 167, 197, 198, 199</td>
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<td>Geology 3, deposit for loss and breakage</td>
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<td>Military Uniform deposit</td>
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<td>Aeronautics 37, 137, 138, 139—$10.00 per clock hour for dual instruction and $8.00 per clock hour for solo instruction.</td>
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<td>Welding 41, 41a, 42, 42a, 43, 43a, 44, 44a, 45, 45a, 46, 46a, 91, 92, 93, 94, 96, 190, 191 per credit hour</td>
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<td>School of Forest, Range, and Wildlife Management—Senior Field Problems:</td>
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<td>Range Management 196</td>
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<td>Wildlife Management 171</td>
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<td>Cap and Gown rental—Bachelor of Science</td>
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<td>Master of Science</td>
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<tr>
<td>Late Registration, per day (maximum $5.00)</td>
<td>1.00</td>
</tr>
<tr>
<td>Locker rental</td>
<td>1.50</td>
</tr>
<tr>
<td>Master’s Degree Fee for binding and proofing thesis</td>
<td>5.00</td>
</tr>
<tr>
<td>Teacher placement fee</td>
<td>2.00</td>
</tr>
<tr>
<td>Teacher placement re-registration</td>
<td>1.00</td>
</tr>
<tr>
<td>Registration as listener in lecture course in which no credit is derived, per subject</td>
<td>5.00</td>
</tr>
<tr>
<td>Related Training Courses, 58c per clock hour (or per contract with the Veteran’s Administration.)</td>
<td></td>
</tr>
<tr>
<td>Graduate students not in residence and wishing to file thesis credit not to exceed 15 hours shall pay a fee of $10.00.</td>
<td></td>
</tr>
<tr>
<td>Special examinations may be taken in subjects not registered for, on approval of a special examinations committee, and upon payment of $2.00 per credit hour.</td>
<td></td>
</tr>
</tbody>
</table>

**Fees for Private Instruction, Music.** The charge is on the basis of 11/2 credit hours per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christiansen, N. W.</td>
<td>$35.00</td>
</tr>
<tr>
<td>Christiansen, Mrs. N. W.</td>
<td>30.00</td>
</tr>
<tr>
<td>Clark, S. E.</td>
<td>30.00</td>
</tr>
<tr>
<td>Greenwood, Maxine</td>
<td>25.00</td>
</tr>
<tr>
<td>Hughes, John</td>
<td>20.00</td>
</tr>
<tr>
<td>Lundquist, Thelma</td>
<td>20.00</td>
</tr>
<tr>
<td>Paatz, George</td>
<td>30.00</td>
</tr>
<tr>
<td>Poznanski, Mischa</td>
<td>$30.00</td>
</tr>
<tr>
<td>Smith, Mrs. Eleanor J.</td>
<td>20.00</td>
</tr>
<tr>
<td>Sorensen, Mary Jean</td>
<td>20.00</td>
</tr>
<tr>
<td>Thatcher, Mrs. G. W.</td>
<td>35.00</td>
</tr>
<tr>
<td>Thatcher, Patience</td>
<td>35.00</td>
</tr>
<tr>
<td>Torbensen, Eldon</td>
<td>30.00</td>
</tr>
<tr>
<td>Wasserman, Irving</td>
<td>30.00</td>
</tr>
<tr>
<td>Wettl, Walter</td>
<td>35.00</td>
</tr>
<tr>
<td>Wettl, Mrs. Walter</td>
<td>30.00</td>
</tr>
</tbody>
</table>

**Fees for Private Instruction, Speech.** The fee for Speech 12, 112 is $17.50 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are as follows:
Teacher Placement Fee, $2. Required of all students applying for Teacher’s Certificate.

After the first week of each quarter, students changing registration must pay 50 cents for each change.

Registration is not completed until the student has presented his fee card at the cashier’s window, Secretary’s Office, and settled for his fees, and filed his registration cards with the Registrar’s office.

All students, when paying fees, are given official receipts from the Secretary’s Office. These receipts must be presented before refunds are allowed.

All fees except registration fee will be refunded to any student withdrawing from the school by the end of the third week of the quarter. No refunds are allowed after the third week.

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. This 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 $5.00.

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

The fee for Course 150—General Home Economics which is required for Home Economics education certification is $35.00 for the one-half quarter residence in the Home Management House.

The College maintains a modern, well-equipped cafeteria, where students may eat at cost.

Good board and room in private homes costs from $10.00 to $12.00 a week. By renting rooms and boarding themselves, students are able to reduce considerably the cost of room and board.

Students are held responsible for any damage done by them to the College property.

SCHOLARSHIPS, FELLOWSHIPS, AWARDS

The Johansen Scholarship Fund of $5,000, a gift of the late Mrs. Johana Johansen, provides scholarships annually, worth in the aggregate from $125 to $150, for help of worthy students of Junior and Senior rank. Applications for this scholarship for the succeeding year must be filed with the chairman of the Awards and Honors committee on or before April 1.

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. Applications must be submitted by April 1 to Awards and Honors Committee chairman.

KSL Meritorious Scholarships. KSL awards two scholarships, one in technical radio work and one in script writing or broadcasting. Applications should be presented to chairman of Awards and Honors Committee by April 1.
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 to the Awards and Honors Committee on or before April 1. Application must be accompanied by an approved outline of a proposed study project to be completed during the senior year and submitted to the Awards and Honors Committee not later than April 1. Two copies of the complete thesis are to be filed in the College library.

The Rhodes Scholarship. A number of candidates for the Rhodes Scholarships in Oxford University, England, are selected each year from the State of Utah. The scholarships are of the value of $2,000 a year, and are tenable for three years. Students who wish to apply for them must have some social and athletic distinction as well as high scholarship in mathematics, science or letters. All applicants must also have three years of French, and it is advisable to have Latin, German, and English history, as well as high school mathematics. Full information and application blanks may be secured at the President’s Office or from Professor Sherwin Maeser, chairman of the Rhodes Scholarship Committee. Students who wish to apply for these scholarships are advised to start preparing for them in the freshman year. They are usually given to Seniors or graduate students.

The Danforth Summer Fellowship is awarded jointly by the Danforth Foundation and the Ralston Purina Mills to an outstanding member of the Junior class 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. Applications should be filed with the Dean of the School of Agriculture on or before April 1.

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

Sears Roebuck and Company Scholarships:

For Freshmen in the School of Agriculture the company offers 25 scholarships of $100 each, $50 of which is paid at the beginning of the fall term and $50 at the beginning of the winter and spring terms. Winners are determined on the basis of scholarship, financial need, interest in agriculture, citizenship, moral integrity and rural leadership. The winner of this award who has the best scholarship record at the end of his freshman year will receive an additional scholarship of one or two more years. All applications must be submitted to the Dean of Agriculture before June 1. Application blanks and additional information may be obtained from the Dean’s office.

Borden Agricultural Scholarship Award of $300 is given to the student who in 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.

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 at Chicago where he will spend approximately a week studying the meat packing industry. All essays must be submitted in the Dean’s office on or before November 1. Further information may be obtained from the Dean’s office.
The Leadership Challenge Cup is to be 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 the judging of 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 the judging of 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 the judging of sheep.

Home Economics Scholarships and Fellowships

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. In addition, the candidate must be a member of the Home Economics Club.

Danforth Foundation Home Economics Fellowships: The first, 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 various business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation on Lake Michigan.

The second, 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.

The 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.

The 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 solutions, and (3) accommodation of individual interests to what seems to be the common good.

The Home Economics Awards—Certificates of merit conferred annually to senior women in Home Economics adjudged worthy by faculty and Senior students 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. The candidates eligible shall have a grade point average of two or better.
An Annual Scholarship of $25 is awarded by Chi Omega Fraternity 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.

**Medals and Other Awards**

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 Sons of the American Revolution Medal. a gift of the National Society of the Sons of the American Revolution, is awarded each year to the non-letterman, who is a member of the R. O. T. C., and has shown the greatest interest in his military work.

The Utah State Agricultural College Science Medal. a gift of Director Emeritus William Peterson, 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 A 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 who possesses the highest scholastic average for four years of work taken in this College.

**Alpha Kappa Psi Scholarship Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior of the Junior Class in Commerce who possesses the highest scholastic average for three years of work taken in this College.

**Theta Chi Award.** Ten dollars is awarded annually by the Theta Chi Women's Business Fraternity to the Junior girl registered in the Secretarial Science department who has the highest scholastic record in Commerce.

**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.

**The William Alger Awards.** A gold key is awarded annually by Alpha Epsilon Delta, premedical society, to the outstanding Freshman premedical 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 underclass male student (Freshman or Sophomore). 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.
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 women students of the Institution who show 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).

Loan Funds

The U. S. A. C. Faculty Women's League has a loan fund for women students of the College. Loans may range from $50 to $200. Preference is given Senior women. Loans are made at any time during the year when money is available.

The Senior Loan Fund, a gift of the class of 1911, and added to by the class of 1922, has helped many students through 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. Further information may be obtained from Mr. N. D. Salisbury, First Security Bank, Logan, or the chairman of the Awards and Honors Committee.

The 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 are in need of financial assistance. The fund is administered by committee consisting of the Secretary and Treasurer, the Dean of Students, and Mrs. Phillip A. Bullen.

GUIDANCE PROGRAM

The College guidance program is intended to help the student discover his needs, assess his potentialities, and achieve effective self-direction. This program is closely integrated with the instructional program of the College. Every member of the faculty serves in some guidance capacity.

The instructional phases of the guidance program are centered in the offices of the academic deans. Each dean in turn selects members of his staff to serve as advisers to the students of his School.

The Dean of Students as Chairman of the Guidance Committee is the general co-ordinator of the entire guidance program. In addition matters pertaining to foreign students, fraternities, clubs, student employment, and personal assistance are centered in his office.

The Dean of Women serves as an adviser to all women students and to all women's organizations. She also serves as co-ordinator of campus social affairs and as a supervisor of the college-owned residence halls for women students.

Each sorority house and residence hall is supervised by a competent house mother, who is directly responsible to the Dean of Women. House regulations are drawn up by committees made up of student house managers, student executives, house mothers, and the Dean of Women.

Women students living in apartments in town are urged to report all illness directly to the medical staff or to the Office of the Dean of Women. All students are welcome to bring their individual problems to the office of the Dean.
STUDENT HEALTH SERVICE

The following medical service is available to students on the U. S. A. C. Campus:

1. Physical examinations are made of all new students and of all who participate in athletic and physical education activities. A health record is kept of every student.

2. Re-checks and follow-up medical care are given students who require special observation.

3. Laboratory tests, blood counts, urinalyses, and Wasserman tests are given as part of the physical examinations, if indicated, or as aids to physicians in making a diagnosis.

4. Immunization against smallpox is given without cost to the student. For other vaccinations or tests that students request, the student furnishes the vaccine or serum.

5. The Health Service offers out-patient dispensary care, with an unlimited number of office calls. Office hours: 8:00 a.m. to 5:00 p.m. (including noon hour) daily, on school days.

6. X-Ray, for students who are injured while participating in school activities. When X-Ray is authorized by the school physician, it is made without cost to the student.

7. Infirmary or bed care is not furnished.

8. The physician is employed on a part-time basis but is available for emergency calls for injuries which occur during campus activities.

The College physician will call, during the morning hours, on students who are ill in their homes. Therefore, he should be notified before noon on the day of illness. Students who are ill and come to school, regardless of their physical condition, should come to the Student Health Service in the Smart Gym before attending classes. This would help to safeguard the school against contagious disease. Prompt reporting of illness would expedite care and prevent many of the midnight calls. In the past the majority of night calls have been for illnesses of over 24 hours' duration and should have received attention during the regular school hours.

9. The students do not pay a health fee.

10. This service does not include the wives or children of students.

11. The physician does not make home calls for accidents which occur off the campus or in the homes of the students.

12. The Student Health Service is located in room 12, Smart Gymnasium.

13. The physician's hours are 9:00 a.m. to 12:00 noon daily, on school days.

14. If you wish to contact the Health Service call Extension 51.

The nurses' hours are from 8:00 to 5:00 daily, on school days.

SPEECH CLINIC

The Speech Clinic provides special classes to meet the needs of foreign students. Both group and individual instruction at the Speech Clinic can be obtained by foreign students so that they can learn the use of American English as rapidly as possible.

Remedial training is available for those individuals possessing speech handicaps. The types of problems handled include stuttering or stammering, stage fright, slow speech development in children, baby talk, lisping and other disorders of articulation, cleft palate and hare lip, paralytic speech, foreign accent and dialectic speech, "nervous" speech conditions, nasal speech, high or thin voices, etc. All college students who have defective speech should register with the speech clinic where they will receive immediate attention. This training is also available to non-college students.
PSYCHOLOGICAL CLINIC

The Department of Psychology conducts a psychological clinic whose services are available to students in the College, to the public schools of the state, to child welfare and other public welfare agencies, to juvenile courts and adult probation and parole officers, and to private individuals who may apply for them. The services include:

1. Educational and vocational guidance.
2. Diagnosis and guidance for gifted, subnormal, and delinquent children.
3. Diagnosis and recommendations for treatment of conduct and personality maladjustments.
4. Diagnosis and recommendations for remedial instruction for achievement difficulties in reading, language, arithmetic, general study habits, and other subjects.
5. Assistance to speech correctionists in the diagnosis and corrective treatment of speech defectives.
6. Administration of tests to determine matriculation status of students who have not completed their high school requirements.

Except for students registered in the College a fee of approximately $3.00 per hour of professional service is charged, payable to the Secretary-Treasurer. For participation of trained student help there is no charge.

MARRIAGE COUNSELING SERVICE

Pre-marital and marital consultation is offered by the Department of Sociology and the Division of Social Work of the College.

COLLEGE CITIZENSHIP

The College expects its students to exemplify those standards of dependability, honor, and integrity which characterize responsible citizens.

"Students are expected to show both within and without the College such respect for order, morality, personal honor, and the rights of others, as is demanded of good citizens. Failure to do this will be sufficient cause for removal from the Association." Sec. 5, Constitution, Associated Students of Utah State Agricultural College.

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 Catholic, Protestant and Latter-day Saint 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.
COURSES OF INSTRUCTION

In the following section the courses of instruction offered by the College are listed under the names of the seven academic Schools into which the Institution is organized.

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 may 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

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General Information

The well trained person is the one who receives employment opportunities in agriculture as well as in other fields of endeavor. Opportunities in crop and livestock production, marketing, extension work, teaching, research, and the various commercial fields connected with agriculture await students who have an adequate background of basic and 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 territories despoiled by war. Increase of soil fertility through prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution by trained men. Thus a great opportunity and a challenge are open to those 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. With the technical courses in crop and animal production, agricultural economics and rural social science, soil management, and others, instruction is offered in mechanic arts and in the 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 and scientific agricultural training and contribute to the well-rounded education of students.

Instruction includes not only the principles, but the practice of agriculture. The College farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards, and technical equipment offer excellent opportunities for the combination of scientific study and practical experience. Outstanding representatives of the 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. Advance Domino 3d, senior Hereford sire and Roanridge Major Mercury, senior Shorthorn sire and a number of outstanding foundation heifers of both breeds have been purchased by the College from a fund totaling $12,000 which was donated by the Sears-Roebuck Foundation. Four breeds of sheep, Rambouillet, Columbian, Hampshire, and Southdown are maintained for comparative study. Duroc Jersey swine, registered Percheron horses, and a thoroughbred Remount stallion are also kept. The College dairy herd is made up of purebred Jersey and Holstein-Friesian cattle. S. C. White Leghorns, New Hampshires, Rhode Island Reds and Barred Rock chickens and Broad-breasted Bronze turkeys are available in the poultry yards. These animals afford teaching materials and also experience in the care and handling of livestock.

Utah Agricultural Experiment Station is bringing to light better methods of feeding, more productive systems of cropping, more valuable strains of fruits, crops and livestock, more remunerative systems of marketing agricultural products, and other improvements. These investigations are studied by the students first hand, and through student employment, a number take an active part in conducting the research work of the Experiment Station. This arrangement gives to the student clearer insight into scientific methods and, at the same time, valuable practical experience. Special attention is given improved methods in farming operations, in the use of tools and machinery, and in the management of livestock and crops.

The great practical value of the various curricula of the School of Agriculture is shown by the records of those students who have completed them and who have gone back to the farm, or who, after graduation, have taken up the work of specialists as teachers or investigators. Such men are proving themselves leaders in their chosen work.
Students entering the School of Agriculture may pursue one of four courses leading to the degree of Bachelor of Science in Agriculture.

**GENERAL AGRICULTURE**

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

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 the first two years. Later, when he decides to major in a specific field, he can arrange to do so without serious complications.

**COURSE OF STUDY FOR MAJORS IN GENERAL AGRICULTURE**

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) **Exact Science, Biology, General Social Science, and Language and Arts**

<table>
<thead>
<tr>
<th>Field</th>
<th>Credits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXACT SCIENCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math 34 or 35</td>
<td>3 or 5</td>
<td></td>
</tr>
<tr>
<td>Chem. 10, 11 &amp; 12 or equiv.</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>BIOLOGY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botany 24 or 25</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Bacteriology 1 &amp; 2 or 3 &amp; 70 &amp; 71</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Zoology 2 or 3 and 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>31 or 36</td>
</tr>
<tr>
<td><strong>GENERAL SOCIAL SCIENCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soc. 10 or 70, or Pol. Sc. 10, or Hist. 14</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Agr. Econ. 53 &amp; 54</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>LANGUAGE AND ARTS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 10 &amp; 110</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Language and Arts Group</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total prescribed</strong></td>
<td>149</td>
<td></td>
</tr>
<tr>
<td><strong>Elective</strong></td>
<td>37</td>
<td>186</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>186</td>
<td></td>
</tr>
</tbody>
</table>

*Not more than 15 credits of the 26 to be taken in one department, and the total of 26 credits to be selected from each of the four departments: Agronomy, Horticulture, Landscape Architecture and Planning, and Vegetable Crops. Soils 58 is required as part of the 26 credits.

**Not more than 15 credits of the 26 to be taken in one department, and the total of 26 credits to be selected from each of the four departments: Animal Husbandry, Dairy Industry, Poultry Husbandry, and Veterinary Science."
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, Vegetable Crops, 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.

To major in these departments, the student must obtain certain basic training and a general view of the entire field of agriculture and meet the requirements of the department in which he chooses to major. To achieve this background and basic training, the student, during the four-year period, must complete at least three credits of basic work in each of the following departments:

<table>
<thead>
<tr>
<th>Agricultural Economics and Marketing</th>
<th>Horticulture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agronomy</td>
<td>Landscape Architecture &amp; Planning</td>
</tr>
<tr>
<td>Animal Husbandry</td>
<td>Poultry Husbandry</td>
</tr>
<tr>
<td>Dairy Industry</td>
<td>Vegetable Crops</td>
</tr>
</tbody>
</table>

He must also complete the following courses:

<table>
<thead>
<tr>
<th>Mathematics 34 or 35</th>
<th>Language and Arts, 8 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 10, 11, 12, or 3, 4, 5</td>
<td>English 10 and 110</td>
</tr>
<tr>
<td>Agricultural Economics 53 and 54</td>
<td>Agronomy 55</td>
</tr>
<tr>
<td>Sociology 10 or 70, or Political Science</td>
<td></td>
</tr>
<tr>
<td>10, or History 14</td>
<td></td>
</tr>
</tbody>
</table>

A minimum of 14 credits in the following courses:

<table>
<thead>
<tr>
<th>Botany 24 and 25</th>
<th>Bacteriology 1, 2, 3, 70, 71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoology 2, 3 and 4</td>
<td>Zoo. 1 or Bot. 1</td>
</tr>
<tr>
<td></td>
<td>Phy. 4</td>
</tr>
</tbody>
</table>

(See various department course requirements in this group Zoo. 1, Bot. 1 and Phy. 4 not accepted by some departments.)

A total of 186 credits, 54 of which are of upper division grade, are required for graduation from the School of Agriculture.

VOCATIONAL AGRICULTURE

This course of study is designed to meet the needs of those students who are planning to teach vocational agriculture in rural high schools. In this curriculum, emphasis is given to practical farm experience, a broad general training in the basic fields of agriculture, and a consideration of methods and techniques of training youth and adults in the vocation of farming.

The breadthness and extent of the training is such that a major part of this program is prescribed. This curriculum has been planned to meet the Utah requirements for certification.
### Exact Science:  

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 10, 11, 12</td>
<td>15</td>
</tr>
<tr>
<td>Physics 3</td>
<td>5</td>
</tr>
<tr>
<td>Mathematics 34</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Speech or</td>
<td></td>
</tr>
<tr>
<td>*World Literature</td>
<td>5</td>
</tr>
</tbody>
</table>

### Biological Science:  

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany 24 or 25</td>
<td>6</td>
</tr>
<tr>
<td>Zoology 2</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 112 (Genetics)</td>
<td>5</td>
</tr>
<tr>
<td>*Bacteriology 1, 2, 3 or 70, 71</td>
<td>5</td>
</tr>
</tbody>
</table>

### Language and Arts:  

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Landscape Architecture</td>
<td>3</td>
</tr>
</tbody>
</table>

### Institutional and General Requirements

#### Cr. Tot.

- 11
- 12
- 15
- 23
- 23
- 3
- 23

**Total Requirements**

- Exact Science
- Biological Science
- Language and Arts
- Institutional and General

---

### Basic Requirements in Agriculture

#### Cr. Tot.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Industry:</td>
<td></td>
</tr>
<tr>
<td>Animal Husbandry</td>
<td>5</td>
</tr>
<tr>
<td>Plant Industry:</td>
<td></td>
</tr>
<tr>
<td>Agronomy</td>
<td>4</td>
</tr>
</tbody>
</table>

### Agricultural Economics:  

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agr. Econ 53, 54</td>
<td>6</td>
</tr>
</tbody>
</table>

### Irrigation and Drainage:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrig. &amp; Dr.</td>
<td>4</td>
</tr>
</tbody>
</table>

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

#### Cr. Tot.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cr. Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Industry†</td>
<td></td>
</tr>
<tr>
<td>Basic Courses</td>
<td>5</td>
</tr>
<tr>
<td>Elective</td>
<td>15</td>
</tr>
<tr>
<td>Plant Industry†</td>
<td></td>
</tr>
<tr>
<td>Basic (Soils 56)</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>16</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>5</td>
</tr>
<tr>
<td>Elective</td>
<td>7</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td></td>
</tr>
<tr>
<td>(Including Irrigation)</td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>16</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
</tr>
</tbody>
</table>

**Total Requirements**

- Agriculture
- Education
- Institutional and General

---

†Elective courses must be selected from at least two departments.

*Meets lower division group requirements.
TECHNICAL COURSES

For students who plan to do graduate work or to enter into a field of employment where technical training is required, a technical course is provided in each of the following fields: Agricultural Economics, Agricultural Mechanics, Animal Husbandry, Bacteriology, Botany, Dairy Husbandry, Dairy Manufacturing, Horticulture, Landscape Architecture and Planning, Poultry Husbandry, Soils, Soils and Irrigation, Vegetable Crops, and Zoology, Entomology and Physiology. Students may register for these courses only upon permission of the head of the department and permission from the Agricultural Council. Minimum requirements of six credits each in Applied Plant Industry, Applied Animal Industry and Agricultural Economics must be met by students taking these courses.

NON-DEGREE COURSE

The School of Agriculture also offers a two-year non-degree course in practical agriculture for students who do not want 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. Emphasis is placed on practical farm problems.

SUGGESTED COURSES OPEN TO STUDENTS IN THE NON-DEGREE COURSE IN AGRICULTURE

Agricultural economics 53, & 54, 70, 102, 110.
Agricultural engineering 14a, 15a
Agronomy 1, 56
Animal husbandry 1, 10
Dairy husbandry 1, 3
Horticulture 1, 8
Irrigation and drainage 10
Landscape architecture 3
Poultry husbandry 1 & 2
Vegetable crops 1
Veterinary science 20

Besides completing a 20-credit major in either 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 2</td>
<td>3</td>
</tr>
<tr>
<td>English 10</td>
<td>5</td>
</tr>
<tr>
<td>Math. 34</td>
<td>3</td>
</tr>
<tr>
<td>Pol. Science 10, or History 14, or Sociology 10 or 70</td>
<td>5</td>
</tr>
</tbody>
</table>

Students in the non-degree course must complete 90 credits to obtain a certificate.
Agricultural Economics and Marketing

Administered jointly by the School of Agriculture and the School of Commerce


Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from that School, include certain basic agricultural courses prescribed by the major professor.

To meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule of this prescribed course may be obtained from the office of the Department of Agricultural Economics.

A Master of Science Degree—The Department offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in agricultural economics by the Department staff with the assistance of graduate students. The following courses may be used for graduate credit by students majoring in the Department: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122. For graduate students in other departments the following courses may be used for graduate credit: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120.

A minimum of five credits in the principles of economics is a prerequisite for all courses in agricultural economics.

RURAL ECONOMY

53. 54. Principles of Economics. Basic principles of economics with emphasis on those of particular importance in Agriculture and Forestry. (53:3F or W) (54:3W or S) Israelensen, Morrison, Anderson

55. Principles of Agricultural Economics. An analysis of agricultural economics, including description, scope, and relationship to agricultural production and distribution. (3F) Staff

104. Economic Development of Agriculture. Analysis of the geography and use of agricultural resources with special reference to the United States. (3F) Israelensen

230, 231, 232. Public Problems in Agriculture. Seminar courses to familiarize students with economic implications of problems confronting agriculture. Special references to postwar problems. (1F, W, S) Thomas

Farm Management, Land Economics, and Agricultural Finance

70. Farm Accounts. Farm accounts and their application to the organization and management of farms and to the filing of income tax statements. (3F or W) Blanch and Morrison

102. Principles of Farm Management. Principles underlying organization, management, and financial success of farms. Rates of production, labor efficiency, combination of enterprises and farm layout. (3F, W or S) Blanch and Morrison
103. Principles of Farm Management. Laboratory. Prerequisite or taken simultaneously: Ag. Econ. 102. (2F, W or S) Blanch and Morrison


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

205. Advanced Agricultural Credit. Primarily to give students advanced training and experience in agricultural finance. Prerequisite: Ag. Econ. 105. (3S) Morrison

206. Farm Appraisal. A basic course in land appraisal and economic classification of land. (2S) Blanch

Marketing and Prices


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

113. Analysis of Farm Cooperatives. For students who desire detailed work in organization and management of cooperatives. Prerequisite or taken simultaneously: Ag. Econ. 112. (2S) Thomas

114. Marketing Fruits and Vegetables. The principles of marketing as applied to the marketing of fruits and vegetables. (Not given 1949-50) Lamborn

115. Marketing Poultry and Dairy Products. The principles of marketing as applied to the marketing of poultry and dairy products. (Not given 1949-50) Anderson

116. Marketing Livestock and Livestock Products. The principles of marketing as applied to the marketing of livestock and livestock products. (3F) Broadbent

120. Agricultural Prices. Price movements and changes as they relate to agriculture. (3S) Thomas

121. Statistical Methods. Statistical methods used in analyzing prices and other economic data. (3F) Israelsen

122. Statistical Methods. Interpretation of statistical data and application of statistical techniques to specific price and production problems. Prerequisite: Ag. Econ. 121. (3W) Israelsen

162. Marketing Agricultural Products. Principles, problems, and methods of marketing agricultural products. Prerequisites: Ag. Econ. 62. (3W) Staff

163. Advanced Marketing. Principles of marketing and their applications to specific problems. Prerequisite: Ag. Econ. 162. (3S) Staff

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 and Techniques Applied to the Fields of Farm Management and Land Economics. Prerequisite: Ag. Econ. 240. (2W) Staff

242. Research Methods and Techniques Applied to Marketing. Prerequisite Ag. Econ. 240. (2S) Staff
Agricultural Education

L. R. Humpherys, Professor

Students majoring in Vocational Agriculture are supervised by this department. The requirements for the course in Vocational Agriculture are outlined on page 70. To meet these rather comprehensive requirements and the Utah certification requirements, a major part of this curriculum is prescribed Among others, a composite major of 72 hours is required in agriculture and 33 hours in professional education.

Master of Science Degree. An opportunity is offered for research and graduate study in Agricultural Education through any of the major departments in the School of Agriculture. Students planning to do graduate work should select a program of study coordinated in the Schools of Agriculture and Education.


124. Methods of Teaching Farm Mechanics. Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and manage-

125. Methods of Teaching Agriculture. For teachers of vocational agriculture, ment, skill requirements, and supervised practice. (5) Humpherys

Fundamental principles and practices of teaching, selection, and organization of subject matter and supervision of agricultural activities on the farm. (5W) Humpherys

126. Directed Teaching in Agriculture. Student observation and teaching in approved local vocational agricultural departments under supervision. Trainees are expected to leave the campus to train in selected high schools of the state for a full teaching program. (4-8 W or S) Humpherys

151. Extension Methods. For prospective home demonstration and county agricultural agents. This course includes study of the history, objective, organization and accomplishments of Extension work in the United States. Farm and home problems, youth and adult education, and Extension methods receive emphasis. (3F or S) Staff

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

226. Organization of Adult Instruction. The fundamental concepts in the organization and instruction of adults, principles and techniques of teaching adult classes. (3S) Humpherys

Agronomy


Bachelor of Science Degree in Agronomy

Study and research in Agronomy focus upon problems of crop production in arid regions. The course offerings emphasize the interrelationships of plants, soil, *On leave of absence.
SCHOOL OF AGRICULTURE

precipitation, and irrigation water in the production of maximum crop yields under a variety of conditions. Three types of majors for the bachelor's degrees are offered within the department: General Agronomy, Technical Field Crops, and Technical Soils. In addition, a joint major is offered between the departments of Agronomy and Irrigation and Drainage. This major is termed Irrigation and Soils.

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. Students interested in soil conservation and agronomic aspects of land reclamation usually major in general agronomy, but may partially specialize in either crops or soils. Training in general agronomy is preparatory to civil service positions such as agronomists, conservationists, 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 meet needs of 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.

In addition to the general college and School of Agriculture requirements, all majors in General Agronomy are required to take the following courses: Geology 3, Botany 24 and 25, Bact. 1 and 2, Math. 44, and Agronomy 56, 101, 102, 103, 107, 111, 112, 155.

Major in Technical Field Crops

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

In addition to the general college requirements, majors in Technical Field Crops will be required to take the following courses: Chem. 3, 4, 5, 121, 122; Math. 99, Bot. 24 and 25, 120 or 130; Bact. 1 and 2; Irrig. and Dr. 10; Agron. 56, 101, 102, 103, 107, 109, 111, 112, 114, 131, and 132. A suggested outline of courses may be obtained from the Agronomy Department.

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 of high scholastic standing with marked ability in the fundamental sciences will find distinct opportunity in this major.

In addition to the general college requirements, students in Technical Soils will be required to take the following courses: Chem. 3, 4, 5, 117, 118, 121, 122; Math. 99; Physics 20, 21, 22; Geol. 3; Botany 24, 25 and 120; Bact. 1 and 2; Irrig. and Dr. 10; Agron. 56, 101, 102, 103, 107, 111, 112, 114, 131, and 132 and 155. A suggested outline of courses may be obtained from the Agronomy Department.

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 of the opportunities in this field.

An outline of courses with further details concerning course requirements and employment opportunities can be obtained from the Department of Agronomy or the Department of Irrigation and Drainage.
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 field of study pursued. The outline of studies and the research program are designed around the objectives of the individual student. The department, in cooperation with other 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 department courses in the one hundred series are acceptable for graduate credit toward the Master of Science Degree in the department: 102, 103, 107, 109, 114, 115, 125, 155, 160, 170.

Doctor of Philosophy Degree

The Agronomy Department in cooperation with a number of 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 in relation to irrigation agriculture. More detailed information may be obtained from the department or the Dean of the Graduate School.

A Suggested Course in General Agronomy

<table>
<thead>
<tr>
<th>Fall Courses</th>
<th>Credits</th>
<th>Winter Courses</th>
<th>Credits</th>
<th>Spring Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 34</td>
<td>3</td>
<td>Ag. Econ. 54</td>
<td>3</td>
<td>Bacteriology 1 &amp; 2</td>
<td>5</td>
</tr>
<tr>
<td>Ag. Econ. 53</td>
<td>3</td>
<td>Math. 35</td>
<td>5</td>
<td>Math. 44</td>
<td>3</td>
</tr>
<tr>
<td>Botany 24</td>
<td>5</td>
<td>Botany 25</td>
<td>5</td>
<td>Poultry 1 &amp; 2</td>
<td>4</td>
</tr>
<tr>
<td>Agron. 1 or Hort. 1</td>
<td>3</td>
<td>Agron. 10</td>
<td>1</td>
<td>Veg. Crops 1 &amp; 2</td>
<td>4</td>
</tr>
<tr>
<td>Landscape 3</td>
<td>3</td>
<td>Electives</td>
<td>3</td>
<td>Electives</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sophomore Fall Courses</th>
<th>Credits</th>
<th>Winter Courses</th>
<th>Credits</th>
<th>Spring Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language and Arts 3</td>
<td>3</td>
<td>Eng. 10</td>
<td>5</td>
<td>Chem. 5</td>
<td>5</td>
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<tr>
<td>Geol. 3</td>
<td>5</td>
<td>Chem. 4</td>
<td>5</td>
<td>Agron. 56</td>
<td>4</td>
</tr>
<tr>
<td>Chem. 3</td>
<td>5</td>
<td>Dairy 1</td>
<td>3</td>
<td>Chem. 12</td>
<td>5</td>
</tr>
<tr>
<td>Agron. 18</td>
<td>3</td>
<td>Electives</td>
<td></td>
<td>Electives</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Junior Fall Courses</th>
<th>Credit</th>
<th>Winter Courses</th>
<th>Credit</th>
<th>Spring Courses</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Agron. 107</td>
<td>5</td>
<td>An. Hus. 10</td>
<td>5</td>
<td>Ent. 108</td>
<td>5</td>
</tr>
<tr>
<td>Agron. 102</td>
<td>3</td>
<td>Agron. 101</td>
<td>3</td>
<td>Agron. 103</td>
<td>4</td>
</tr>
<tr>
<td>Irrig. Dr. 10</td>
<td>4</td>
<td>Agron. 132</td>
<td>3</td>
<td>English 110</td>
<td>4</td>
</tr>
<tr>
<td>Agron. 131</td>
<td>3</td>
<td>Soc. Sci.</td>
<td>5</td>
<td>Agron. 114</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
SCHOOL OF AGRICULTURE

Senior

Fall
Zoo. 112 ........................................ 5
Botany 130 ........................................ 5
Agron. 111 ........................................ 1
Electives ........................................ 6

Winter
Agron. 109 ........................................ 4
Agron. 112 ........................................ 1
Agron. 155 ........................................ 3
Agron. 160 ........................................ 3
Electives ........................................ 6

Spring
Range Mgt. 160 .................................. 5
Agron. 125 ........................................ 3
Ag. Econ. 102 .................................... 3
Electives ........................................ 6

NOTE: See School of Agriculture requirements on page 68.

By special permission, Chem. 10 and 11 may be substituted for Chem 3, 4 and 5. Chem. 121 and 122 may be taken instead of Chem. 12.

Farm Crops

1. General Farm Crops. Introductory course in crop production. Two lectures, one 3-hour lab. (3F, W or S) Staff


18. Weeds. Identification of weed seeds 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) Tingley

101. Cereal Crops. The classification, history and cultural methods involved in production of cereal crops. Two lectures, one 3-hour lab. (3W or S) Staff

102. Root and Miscellaneous Crops. Sugar beets, potatoes, cotton, tobacco, mangels, and other root crops are studied in detail as to cultural methods, market types, and commercial possibilities. Three lectures. (3F or W) Staff

103. Forage Crops. Alfalfa, clovers, grasses and other farm forages; classification and methods of production, harvesting and storage; meadow and pasture management, are discussed. Attention is given to the place of these crops in rotation, soil conservation, and erosion control. An assessment will be made for field trips. Three lectures, one 3-hour lab. (4F or S) Evans

105. Seed Analysis and Testing. Impurities of farm and garden seeds; methods of analysis and testing; the inspection and marketing of seeds. Not given except on application of three or more students. One credit for each 3-hour lab. period. (1 or more credits; F, W or S) Tingley

109. Plant Breeding. The principles and practices of plant breeding, technique and improvement by selection and hybridization. Prerequisite: Zoo. 112. Three lectures, one 3-hour lab. (4W) Tingley

124. Advanced Judging. Grading and Identification. Prerequisites: Agron. 104 and 118. Two 3-hour lab. (2S) Staff


209. Advanced Plant Breeding. The science and practice of plant breeding. Original papers and lectures. Three lectures. (3S) Tingley

213. Crops Seminar. Current scientific topics in farm crops. Required of all graduate majors. One conference. (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-hour lab. period. (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 time as Agron. 56 laboratories.
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-hour lab. period. (SS) Pittman


110. Soil Microbiology. Microorganisms are considered in relation to their role in soil fertility and organic matter decomposition. Prerequisites: 1, 2; Agron. 56; Organic Chem. Two lectures, one 3-hour lab. period. (3W) Jones

114. Soil Survey and Land Classification. The influence of environmental factors on soil profile development. Soil and land classification, the methods of mapping soils and the preparation and interpretation of soil type, alkali and land classification maps as related to Utah conditions. Field trips are made to study soil. Prerequisite: Agron. 56 or previous arrangement with instructor. One lecture, two 3-hour lab. periods. (3S) Wilson

125. Soil Conservation. Special problems of soil management and land policy in relation to soil conservation. Practice in making use of soil conservation surveys in planning farms on a soil conservation basis. Prerequisites: Two lectures, one 3-hour lab. period. (3S) Wilson

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

155. Soil and Plant Relations. Plant and soil relationships 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-hour lab. period. (3W) Thorne

156. Genesis and Morphology of Soil. Soil development as influenced by parent material, climate, time, vegetation and topography. Relationship between the soil groups and their use in agriculture. Course for advanced undergraduates and graduate students. Three lectures. (3W) Jennings

170. Special Soil Management Problems. The application of theory in the solution of practical soil management problems. Two conferences. (2W) Staff

212. Seminar. Review of current literature in soil science. Required of graduate students in soil science; open to staff members. One credit per quarter. Time arranged. One conference. Staff

214. Soil Physics. Fundamental laws of physics reviewed, with emphasis on mechanics and thermodynamics and their relation to soil problems. Some time devoted to significant features of modern physics with emphasis on theories of surface forces as they influence the behavior of soil colloids. Special attention to dynamics of soil moisture. A knowledge of elementary physics and mathematics as well as a good foundation in soils is essential. Three lectures. (3W) Gardner

B. Saline and Alkali Soils.
C. Range and Forest Soil Problems.
D. Soil Classification.
E. Genesis and Morphology of Soils.
F. Soil Conservation.
G. Soil Chemistry.
H. Soil Physics.

Reading assignments and discussions of important papers in restricted fields. Open to graduate students in Agronomy or other graduate students with proper qualifications by special permission. Two credits each. Staff

227. Modern Techniques in Soil Research. Reading and discussion in theory and practice in the use of recently developed field and laboratory equipment used in research in the field of soils. Laboratory practice is given in the direct operation of equipment discussed and in the interpretation of data obtained. Two lectures, one 3-hour lab. period. (3W) Staff
SPECIAL COURSES

10. Professional Agronomy. Discussion of agronomic fields. Planning the educational program for a professional agronomist. Required of all freshmen in Agronomy. One lecture. (1W) Staff

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

116. Dry Farming. Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the Mountain regions; and analysis of the possibilities in typical climatic areas, and on important soil types. Two lectures. (2S) Staff

117. Geography of Agriculture. A brief review of the fundamental principles of climatic controls. The principal agricultural regions of the world are studied, with topography, climate, soils, crops, livestock, population and industries considered in relation to agriculture. Three lectures. (3W) Pittman


218. Special Problems. Special problems in crop production, crop breeding, soil fertility or other phases of agronomic work are investigated. Students review literature on the problem and conduct experiments in the laboratory or on field plots. 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

250, 251, 252. Advanced studies under plan "B". Special library and seminar problems or studies designed to meet requirements for reports under plan "B." For details regarding nature and selection of subject matter, limitation of credits and types of reports see Graduate School. 2-5 credits each quarter. Staff

Animal Husbandry


Students majoring in Animal Husbandry are expected to complete 30 credits in this field, and to include courses Nos. 1, 2, 10, 40, 110, 125, 150, 155, 160 and 165.

For students who plan to take up livestock production, county agent work, vocational agricultural teaching or some similar field of work, a minor in Agricultural Economics, Agronomy, Dairy Husbandry, Poultry Husbandry or Range Management is recommended.

Graduate work leading toward the master of science degree is offered in animal breeding, nutrition, and production. Courses numbered 200 and above are designated for graduate students. Courses 110, 120, 125, 150 and 155 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the department chairman. Students who plan to do graduate work may be admitted to the technical course in Animal Husbandry by permission of the department chairman and the dean. For such students a minor in chemistry, physiology or zoology is suggested.
1. Fundamentals of Animal Husbandry. Planned to give an understanding of livestock production in relation to other phases of agriculture in the United States and Utah, the influence of geographical location and conditions upon livestock production, the various types of farm animals and the functions performed or products produced, and an introduction to the important factors in the successful production of livestock. (3F or S)  
L. L. Madsen

2. Animal Husbandry Laboratory. Laboratory exercises in judging, market classification and practical problems. Should be taken at the same time as A.H. 1. Two lab. periods.  
M. A. Madsen

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

20. Fur Farming. Breeding, feeding, diseases, management and marketing of furs of the various domestic fur animals, especially foxes, minks and rabbits. (2W)  
Harris and Miner

40. Fitting and Showing Livestock. Current methods of fitting and training livestock for showing. Each student prepares one animal for show and exhibits it in the fitting and showing contest in spring quarter. May be repeated. (1S)  
Bennett

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

115. Horse Production. Factors involved in economical production and use of draft and light horses, including breeds of horses, breaking and training, feeding, breeding, housing, handling and marketing. Prerequisite: A. H. 10. (2W)  
Bennett

120. Swine Production. Systems of production with emphasis on those suited to western conditions, breeds of swine, management and feeding of the breeding herd, and feeding for market. The relation of the industry to dairy farming. Prerequisite: A. H. 10. (2W)  
Bennett

125. Sheep Production. Range and farm sheep, with emphasis on range production. Methods of production of lambs and wool, grading and marketing practices, feeding and studies of the breeds of sheep and their adaptation to the different husbandry practices. Prerequisite: A. H. 10. (3W or S)  
M. A. Madsen

150. Animal Nutrition. Attention is given various fundamental phases of animal nutrition, including protein, carbohydrate, fat and mineral metabolism, vitamins, content and deficiencies of range forage, and feed and forage poisoning. Prerequisites: Chem. 10, 11, 12 (or equivalent), and An. Hus. 10. (4F)  
L. L. Madsen

151. 251. Nutritional Diseases. Special consideration will be given to cause, detection, treatment and prevention of the major nutritional diseases of laboratory and farm animals. Prerequisite: An. Hus. 150. (3W)  
L. L. Madsen

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

160. Livestock Production Problems. Attention is given various problems in livestock production, particularly in Utah. Students are expected to apply knowledge acquired in previous courses in the solution of problems they will face in the field after graduation. Prerequisites: A. H. 118 and 125. (3W)  
M. A. Madsen

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

Administered jointly by the School of Agriculture and the School of Arts and Sciences

J. E. Groaves, Professor Emeritus; W. Whitney Smith, W. B. Preston, K. R. Stevens, Professors; John H. Carlquist, G. Albin Matson, Special Professors; L. W. Jones, Associate Professor; Ann Burns, Instructor; E. H. Bramhall, Special Instructor.

Bachelor of Science Degree in Bacteriology and Public Health

To qualify for the Bacteriology Major in Specialized Agriculture, page 69, students should take: Bacteriology 1 or 70, 2 or 71, 104, 105, 107, 110, 120, 160, 180, 191, Botany 24, 25, Chemistry 10, 11, 12, 190, Mathematics 34 or 35, Physiology 4, 10, Physics 6 and 7, Zoology 2, or 3 and 4, Public Health 50.

To qualify for the Bacteriology major in the Technical course in Agriculture, (see page 71) students should take: Bacteriology 1 or 70, 2 or 71, 104, 105, 107, 110, 120, 160, 170, 180, 191, 192, 193, Botany 24, 25, 130, 150, 151, Chemistry 3, 4, 5, 17, 118, 121, 122, 191, Mathematics 35, 46, Physics 21, 22, Public Health 50, Zoology 3, and 116. See Bacteriology and Public Health in the School of Arts and Sciences for other degree offerings.

See pages 47 and 48 for courses that may satisfy group requirements.
Master of Science Degree in Bacteriology

The Bacteriology and Public Health Department offers opportunity for research and graduate study leading to the Master of Science Degree in the various specialized fields; the research and graduate possibilities in these various fields are greatly augmented through the cooperation of the U. S. Department of Agriculture.

The following courses may be used for graduate credit by students in the Department of Bacteriology: 107, 110, 120, 162, 164, 166, 167, 170, 180.

For graduate students in other departments the following courses in the 100 series may be modified and used for graduate credit: Bacteriology 104, 107, 110, 120, 140, 160, 162, 164, 166, 167, 170, 180 and Public Health 144, 151.

Courses numbered over 200 are largely restricted to graduate students.

BACTERIOLOGY

1. Elementary Bacteriology. Biology and significance of bacteria and other microorganisms; their morphology and physiology; fundamental principles governing bacteriology of water, sewage, milk, food sanitation, communicable diseases, etc. Where possible this course should be accompanied by Bact. 2 or 71. (4F, W or S) Greaves, Stevens, Smith

2. Elementary Bacteriology Laboratory. Fundamental experiments in Elementary Bacteriology. Prerequisite: Concurrent registration in 1 or 70. (1F, W or S) Stevens and Staff

3. Bacteriological Demonstration. A demonstration of the more important experiments, principles, and fundamentals of Elementary Bacteriology. One 1-hour laboratory demonstration. Prerequisite: Concurrent or previous registration in 1. One credit. (Not offered in 1949-50)

70. General Bacteriology. Fundamental principles of the nature, growth, and survival of microbes. Practical applications of bacteriology. Recommended for majors in science departments. Prerequisite: One year of college chemistry. Four lectures. Concurrent laboratory instructions are offered in 2 and 71. (4F) Jones

71. General Bacteriology Laboratory. Basic laboratory methods and laboratory observation of fundamental bacteriological principles. Prerequisite: Previous or concurrent registration in Bacteriology 1 or 70. (2F) (Not offered 1949-50)

104. Dairy Bacteriology. The microorganisms of milk and dairy products and their relation to the production, spoilage, and sanitation of such products. Prerequisite: Bact. 1 or 70. (3S) Jones

105. Dairy Bacteriology Laboratory. Experiments to demonstrate the fundamentals discussed in the lecture course. Two 3-hour laboratory periods. Prerequisite: Bact. 1 or 70. (3S) Jones

107. Systematic and Determinative Bacteriology. The isolation, identification and classification of bacteria. Prerequisite: Bact. 2 or 71. Two lectures, one lab; 6 lab. hours arranged. (5W) Staff

110. Soil Microbiology. The relationship of bacteria to processes of soil fertility. Prerequisites: Bacteriology 2 or 71. Two lectures, one lab. (3W) Jones

120. Food Microbiology. The microorganisms involved in food production, processing, preservation, and spoilage. Prerequisites: Bact. 2 or 71, Organic Chemistry. Three lectures and two 3-hour lab. periods. (5F) Stevens

131. Clinical Laboratory Methods. Discussion and practical experience in the laboratory methods used in the diagnosis of disease. Prerequisites: Bact. 2 or 71, Organic Chemistry. (5W) Staff

132. Advanced Clinical Laboratory Methods. (5S) Staff

133, 134, 135. Applied Medical Technology. A practical course in laboratory work, performed under close supervision following the approximate general schedule below:
<table>
<thead>
<tr>
<th>Course Title</th>
<th>Credits</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Bacteriology and Serology</td>
<td>2</td>
<td>Matson</td>
</tr>
<tr>
<td>Clinical Biochemistry</td>
<td>3</td>
<td>Carquist</td>
</tr>
<tr>
<td>Clinical Hematology</td>
<td>1</td>
<td>Carquist</td>
</tr>
<tr>
<td>Pathological Tissue Methods</td>
<td>3</td>
<td>Carquist</td>
</tr>
<tr>
<td>Blood Bank Procedures</td>
<td>2</td>
<td>Matson</td>
</tr>
<tr>
<td>Electrocardiograph and Basal Metabolism Procedures</td>
<td>1</td>
<td>Carquist</td>
</tr>
<tr>
<td>General Pathology Discussions</td>
<td>2</td>
<td>Carquist</td>
</tr>
<tr>
<td>Clinical Laboratory Methods Discussion</td>
<td>2</td>
<td>Matson</td>
</tr>
<tr>
<td>Pathological Conference</td>
<td>1</td>
<td>Staff</td>
</tr>
<tr>
<td>Standard Methods of Water Analysis</td>
<td>3</td>
<td>Jones</td>
</tr>
<tr>
<td>Pathogenic Bacteriology</td>
<td>3</td>
<td>Staff</td>
</tr>
<tr>
<td>Viruses</td>
<td>2</td>
<td>Jones</td>
</tr>
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<td>Pathogenic Molds and Yeasts</td>
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<td>Staff</td>
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<tr>
<td>Immunology</td>
<td>2</td>
<td>Greaves</td>
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<tr>
<td>Serological Methods</td>
<td>3</td>
<td>Staff</td>
</tr>
<tr>
<td>Industrial Bacteriology</td>
<td>3</td>
<td>Staff</td>
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<tr>
<td>Metabolism of Bacteria</td>
<td>4</td>
<td>Smith</td>
</tr>
<tr>
<td>History of Bacteriology</td>
<td>7</td>
<td>Jones</td>
</tr>
<tr>
<td>Proseminar</td>
<td>2</td>
<td>Smith</td>
</tr>
<tr>
<td>Bacteriological Problems</td>
<td>2-5</td>
<td>Staff</td>
</tr>
<tr>
<td>Problems in Soil Microbiology</td>
<td>2-5 W</td>
<td>Jones, Stevens</td>
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<tr>
<td>Problems in Food Microbiology</td>
<td>2-5 F</td>
<td>Stevens, Jones</td>
</tr>
<tr>
<td>Problems in Pathogenic Bacteriology</td>
<td>2-5 W</td>
<td>Smith</td>
</tr>
<tr>
<td>Problems in Serology</td>
<td>2-5 S</td>
<td>Staff</td>
</tr>
</tbody>
</table>
270. Problems in Industrial Bacteriology. Special assignments, reports and discussions. Review of literature in various phases of industrial bacteriology, and preparation of a comprehensive and critical review of at least one phase. (2-5 W) Smith, Jones

280. Problems in Metabolism of Bacteria. Special assignments, reports and discussions. Review of literature in various phases of metabolism of bacteria, and preparation of a comprehensive and critical review of at least one phase. (2-5 S) Jones, Smith

287, 288, 289. Advanced Bacteriological Problems. Special assignments, reports and discussions. Review of literature of various phases of bacteriology, and preparation of a comprehensive and critical review. (2-5P, W, S) Staff

291, 292, 293. Seminar. Prerequisite: Graduate status and approval of department chairman. (1P, W, S) Staff

299. Research and Thesis. The laboratories are well equipped and library facilities adequate for advanced students in bacteriological investigations in agriculture, household science, foods industries, sanitary science, and veterinary science. (1-5 F, W or S) Staff

Biochemistry—See Chemistry 190-197.
General Virology—See Botany 135.
Microbiological Assay—See Chemistry 194.
Parasitology—See Zoology 116.

PUBLIC HEALTH

15. Personal Health. Health problems of college students. Prerequisite: Physiology 4. (3F, S) Smith, Staff


52. The Control of Communicable Disease. Mechanisms of transmission, prevention and control of the more common contagious diseases. (2S) Smith

144. Sanitation and Public Health. The control of the environment; public health problems, especially rural problems. Prerequisite: P.H. 50. (3W) Staff

151. Community Health. The organization and functioning of official and non-official health agencies in the fields of maternal, infant, pre-school, school and adult hygiene in the light of modern trends and present social needs. Local health problems, especially rural problems. Prerequisite: P.H. 50. (3W) Staff

155. School Health. The practical needs in health and health training in the school. Methods and materials in health training and instruction. (Meets state certification requirements in health education.) (3F, W or S) Smith

159. Public Health Laboratory Methods. Practical experience in the special and routine practices of the Public Health Laboratory. 3-15 credits any quarter as arranged. Bramhall and Smith

160. Pathogenic Bacteriology. (See Bacteriology 160)

162. Viruses. (See Bacteriology 162)

164. Pathogenic Molds and Yeasts. (See Bacteriology 164)

166. Immunology. (See Bacteriology 166)

167. Serological Methods. (See Bacteriology 167)
Botany and Plant Pathology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

B. L. Richards, F. B. Wann, Professors; E. L. Waldee, W. S. Boyle, Associate Professors; George W. Cochran, Associate Research Professor*; Arthur H. Holmgren, Assistant Professor and Curator of the Intermountain Herbarium; R. A. Bush, Instructor; Bassett Maguire, Curator New York Botanical Garden, Non-Resident Professor; Orson S. Cannon, Bryce N. Wadley and George Kaloostian, Collaborators, U. S. Department of Agriculture.

Bachelor of Science Degree in Botany

Course requirement for a major: 24, 25, 30, 116, 11, 120, 130, 150.

Course requirement for a teaching major: 24, 25, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology: 21, 131, 135, 151; Taxonomy: 104, 108, 112; Physiology: 121, 224, 228; Cytology 118.

See pages 47 and 48 for courses that may satisfy group requirements.

Master of Science Degree in Botany

The Department of Botany offers opportunity for research and graduate study leading to a Master of Science Degree in the following specialized fields: Pathology, taxonomy, physiology and cytology. The research and graduate possibilities in these various fields are greatly augmented through the cooperation of the United States Department of Agriculture and the Intermountain Herbarium.

The following courses may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 135, 151.

The following courses may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 131, 135, 150, 151.

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

24. Elementary Botany. An introduction to 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. (SF) Boyle

25. Elementary Botany. A survey of the plant kingdom. Emphasis on comparative morphology and reproductive processes of representatives of the major groups of plants. An introduction to the classification of vascular plants is given toward the end. Three lectures, two labs. (5W or S) Boyle

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

104. Taxonomy of Poisonous Plants. The kinds, relationships, and classifications of poisonous plants, chiefly of this region. Assumes a knowledge of the 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 the fundamental principles of botany. (4W) Holmgren

112. Aquatic and Marsh Plants. A taxonomic and ecological study of aquatic and marsh plants with emphasis on important food and cover plants for wildlife. Assumes a knowledge of the fundamental principles of botany. (3F) Holmgren

*On leave

117. Anatomy. Structure and development of major cell types and tissues; comparative anatomy of the stem, root, and leaf of seed bearing plants. Assumes a knowledge of the fundamental principles of botany. (4S) (Not given in 1950) Boyle

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

120. Elementary Plant Physiology. Fundamental principles of absorption, mineral nutrition, food manufacture, metabolism, translocation, and growth. Assumes a knowledge of the fundamental principles of botany. Prerequisites: Chem. 12 or 121. (5W or S) Wann

121. Water Relations of Native Plants. Consideration of rooting habits, sap concentration, transpiration and water requirements of native plants in relation to distribution and adaptation to environment. Prerequisite: Bot. 120. (3W) Wann

130. Principles of Plant Pathology. Fundamental principles underlying disease in plants. The types of diseases and methods of study are such as give the student a comprehensive view of Plant Pathology. Assumes a knowledge of botany fundamentals. (5F or S) Richards

131. Principles of Plant Disease Control. Fundamental principles underlying disease control practices for all cultivated crops. Prerequisite: Bot. 130 (3S) Waldee

135. General Virology. Biological, physical, and chemical properties of viruses. Designed to provide a basis for study of virus diseases. Prerequisites: Bot. 130 or Bact. 160. (3W) Richards


150. Mycology. Comparative morphology and the nuclear behavior of the fungi. Alternates with 151. Prerequisite: Bot. 130 or Bact. 160. (4F) Waldee


160. 161, 162. Laboratory Methods. Open to qualified senior and graduate students majoring in Botany. (1F, W, or S) Graduate credit may be obtained by registering for 260, 261, 262. (1F, W, S) Staff

221, 222, 223. Pathological Techniques. Special methods as applied to plant pathology, physiology, and related subjects. Registration only by special permission. (2F, W, S) Staff

224. Advanced Plant Physiology. Chemical reactions and transformations underlying the vital processes in plants. Prerequisite: Bot. 120. (3S) (Not given in 1950) Wann

228. Physiogenic Diseases in Plants. Diseases in plants caused by chemical and physical factors in the environment. (3S) Wann

234, 235, 236. Special Problems. Open to qualified students majoring in pathology, taxonomy, plant physiology, or cytology. (2-F, W, S) Staff


Principles of Genetics. (See Zoology 112) Staff

243, 244, 245. Pathology Seminar. (1F, W, S) Staff

250, 251, 252. Research. Open to all qualified college students in botany and plant pathology. Any quarter. Time and credit arranged. Staff

Plant Ecology. (See Range Management 126)
Dairy Industry

G. B. Caine, A. J. Morris, Professors; G. Q. Bateman, P. B. Larsen, Associate Professors; Lyman Rich, Associate Professor, Extension Dairyman;

J. E. Packer, Research Assistant.

Students majoring in Dairy Husbandry must complete the following major courses for graduation: Dairy 3 and 8; An. Hus. 10, 151, 155, and all courses in Dairy Production 109, 110, 111, 112. Chem. 107 and Bact. 104 and 105 are also required.

A suggested course is set up for students majoring in Dairy Manufacturing. Students should study this course carefully and adhere to it as closely as possible. It is expected that students spend at least six months in a commercial dairy manufacturing establishment before graduation. It is strongly recommended that more than six months be spent in dairies if possible. This can usually be arranged by procuring summer work through the department. Good cooperation exists between the department and commercial dairies, and frequent trips are made to them during this course.

There is a good demand in the technical field of dairying for students who have had advanced training.

An opportunity is offered to do graduate work with an application in the field of chemistry, biochemistry, genetics, bacteriology or economics.

1. General Dairy Husbandry. A short general course considering history and present status of the dairy industry; starting dairy herds; breeds of dairy cattle; cow testing associations; club work; study of herd records; call feeding; general principles of feeding, management and housing of dairy cattle. Lab., Judging dairy cattle. (3F, W or S) Caine

2. Principles of Dairy Industry. Introductory to all courses in Dairy Manufacturing and adapted to students taking general agricultural work. It includes the history and development of the dairy industry with definite study of the secretion of milk, the use and operation of Babcock test; and a brief study of butter, cheese, ice cream, and of dairy arithmetic. (3W) Larsen


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

5. Dairy Practice. For special or short course students only. Practice in plant manufacture emphasized. Any quarter. Time and credit arranged. (5F) Morris

6. Breeds of Dairy Cattle. Study of history and development of all breeds of dairy cattle; special emphasis on the various families within the breeds; requirements for official testing; pedigree and herd book study. (4F) (Not given in 1949-50) 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. Problems in merchandising and selling included. (SS) Caine


103. Manufacture of Cheese. Factors involved in the manufacture of cheese of the cheddar and other types. Classification, statistics, curing, marketing, and factory organization. (SF) Larsen

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) Larsen

*On leave
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. Application for admittance must be made in writing. (5F, W or S)  

Morris


Caine, Rich


Caine, Bateman

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

Caine

112. A Study of Feeding and Management of Dairy Cattle on Irrigated Lands. (3W)  

Bateman

115. Seminar. Discussion and reports of current literature. Any quarter. Time and credit arranged.  

Staff

150. Special Problems in Dairy Production. Any quarter. Time and credit arranged.  

Caine

154. Special Problems in Dairy Manufacturing. Any quarter. Time and credit arranged.  

Morris, Larsen


Caine

217. Research in Dairy Manufacturing. Any quarter. Time and credit arranged. (Twelve credits, maximum)  

Morris, Larsen

254. Special Problems in Dairy Manufacturing. Any quarter. Time and credit arranged.  

Morris, Larsen

260, 261, 262. Animal Industry Seminar. Research and current topics of special interest to Dairy Production students. Subjects relating to nutrition, breeding and production. (1F, W, S)  

Staff

Horticulture

S. W. Edgecombe, Professor; R. K. Gerber, Assistant Professor; Clarence D. Ashton, Extension Horticulturist; Odei Kirk, Superintendent, Ogden Substation. 

Students may major or minor in general horticulture, floriculture, or in pomology. The requirements for majors in pomology are: Hort. 1, 6, 8, 10, 101, 102, 111, 112, 115, 151, 153, 154, 155; Landscape architecture 3; Vegetable crops 1, 105; The requirements for majors in horticulture are: Hort. 1, 6, 10, 11, 115, 116, 117, 118, 119, 120, 121, 153, 154, 155; Landscape architecture 3, 40, 41; Vegetable crops 1, 103; For a major in general horticulture students are required to have Hort. 1, 6, 8, 10, 11, 101, 102, 110, 111, 112, 153, 154, 155; Landscape architecture 3; Vegetable crops 1, 105. Supporting courses recommended for all majors are Ent. 108, 109; Zool. 112; Botany 24, 25, 30, 118, 116, 117, 120, 130, 135; Agron. 107, 109, 115; Ag. Econ. 62, 113, 117, I.D. 10, 14a, 15a, 116; Vegetable crops 130; Landscape architecture 40, 41. 

Undergraduate students who plan later to pursue graduate work may be admitted to a technical course by permission of the Head of the Department and the Dean of Agriculture. 

The Department of Horticulture offers work toward a Master of Science Degree in General Horticulture, Floriculture and Pomology.
The following courses may be used for graduate credit: 101, 102, 110, 111, 112, 115, 116, 117, 118, 119, 120, 121, 151, 153, 154, 155, 156.

Only General Horticulture I may be counted to fill the horticultural requirements for students in the various fields of specialized agriculture.

1. **General Horticulture.** Principles and practices underlying production of tree fruits, small fruits, flowers, and ornamental plants. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage, propagation, and stocks. Designed to give a brief resume of each phase. (3F, W or S) Edgecombe, Gerber

6. **Plant Propagation.** A study of the principles and practices involved in the propagation of horticultural plants. (3S)

8. **Small Fruit Production.** Principles and practices involved in the culture of small fruit in home and commercial plantings. (3W)

10. **Principles and Practices of Floriculture.** Fundamental principles and practices involved in the culture of annual and perennial flowers, bulbs, house plants, shade trees, shrubs, lawn grasses and greenhouses plants. (4W) Edgecombe

11. **Garden Flowers.** Principles and practices of growing garden flowers. (3S) Staff

101, 102. **Advanced Pomology.** Principles and practices of orcharding, 101, fruit industry, morphology, flower bud formation, orchard sites and soils, cultural practices, harvesting and storage, varieties, propagation and stocks, 102, fertilizers, spraying, pruning and training, winter injury, nutrition and fruit setting, thinning and alternate bearing, water relations, Hort. 110, 111, 112 are laboratories for these courses and should be taken at the same time. Prerequisites: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 and if possible Hort. 6. (3F, W) (Not given in 1949-50) Edgecombe, Gerber

110, 111, 112. **Orchard Practice.** Laboratories to accompany 101, 102 advanced field work in orchard and small fruit production. Prerequisites: Hort. 1 and if possible Hort. 6 and 8. (1 F, W, S)

115. **Advanced Fruit and Ornamental Plant Breeding.** Fundamental principles and practices of plant breeding in the improvement of fruits and ornamental plants. Prerequisites: Zool. 112; Hort. 1, and preferably 6, 8, 10. (4S) Edgecombe

116. 117. **Commercial Greenhouse Management.** Principles and practices of commercial greenhouse management. Prerequisites: Hort. 1, 6, 10; Bot. 24, 25. Alternate years. (Offered in 1949-50) (3F, W) Staff

118. **Floral Design.** Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. Prerequisites: Hort. 1, 10. Alternate years. (Offered in 1949-50) (3S) Staff

119, 120, 121. **Systematic Floriculture.** 119. Systematic study of garden flowers. Prerequisites: Hort. 1, 6, 10; Bot. 30. 120. Systematic study of plants grown by florists. Prerequisites: Hort. 119, 121. Systematic study of conservatory plants. Prerequisites: Hort. 118b; Alternate years. (Not offered in 1949-50) (3F, W, S) Staff

151. **Systematic Pomology.** Systematic study of fruits, origin, classification, identification, judging, adaptation. Alternates with 101. (Not given in 1950-51) (4F) Edgecombe

153, 154, 155. **Seminar.** Oral and written reports on research papers and original work by student. (1F, W, S) Staff

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

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

Administered jointly by the School of Agriculture and the School of Arts and Sciences

Laval S. Morris, Professor; Kenji Shiozawa, Instructor.

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.

Communities and regions are studied as social and physical organisms. These organisms are analyzed, observed and put together piece by piece. The residential area or subdivision is studied even more intensively than the individual home; lots and their relation to each other are emphasized. The business and industrial areas, the recreational facilities including parks, circulation and car parking space, airports, cemeteries, civic groups and a great variety of public and private areas are studied in relation to people and their needs.

The most intensive training required in landscape architecture and planning is in design. It is a discipline requiring considerable time and restrained imagination. This type of creative work is neither taught nor learned in the same way most subjects are handled. Plato says of it, "... but, after much communing and constant intercourse with the thing itself, suddenly, like a flame kindled from a running fire, it is born into the soul, and hence-forth nourishes itself." When that time arrives in the life of the student design and intellectual pleasure are as one with each other.

Students spending their first year at a junior college, or other institution, should take among other things, mathematics through trigonometry, freshman English, sociology and art.

3. Elements of Landscape Architecture and Planning. Relation of people to land; regions and small areas. Principles of design and composition as applied to various types of land planning. The design of home grounds emphasized. Particular value to those wanting a general knowledge of landscape architecture. Field trip required. (3F or S) Morris

20. Drawing. A general course in drawing 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 from antiquity to the present time, 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. (3W) Staff

41. Plant Materials. Classification, identification, ecological requirements and uses of woody and herbaceous plants for landscape purposes. Both native and introduced plants studied. (3F, S) Staff

60. 61, 62. Architectural Design. The study and design of architectural structures. Relation of buildings to the land. Integration of rooted 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) Staff

135. Travel Course. A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least twice during their training. Time and credit arranged. Morris

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, 83. (2F, W or S) Morris

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

160, 161, 162. Landscape Construction. Master construction plans, grading, drainage, sprinkling systems, structures, cost estimates. (3F, W, S) Staff

170. Town and City Planning. Gathering and analyzing data for town and city planning. Land use, zoning circulation, recreation, housing. (3F) Staff

180, 181, 182. Advanced Planning and Design. Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (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

Poultry Husbandry

Ivan Alder, Professor Emeritus; C. I. Draper, Lawrence Morris, Professors; A. B. Stevenson, Associate Professor; Woodrow Jenkins, Extension Specialist.

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

The department offers work leading to a Master's Degree in Poultry Husbandry to qualified students.

Credit for the following courses may not be used to meet the requirements for this advanced degree: Poultry Husbandry 101, 102, 104, 127.

1. General Poultry. A study of breeds, judging, incubation, brooding, feeding, marketing, designed to meet the needs of the students wishing a general knowledge of the poultry industry and the problems of production, and a foundation upon which other courses are built. (3F or W) Staff

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

3. Turkey Production. A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small farm flocks or large commercial flock management are emphasized. (3W) Alder

10. Poultry Practice. Elementary practice at the poultry yards. Prerequisite: Poultry 1. (S) Draper

101. Poultry Production. A study of poultry production problems, breeds, judging, selection, feeding and management. Poultry Lab. 102 should accompany this course. (3W) Staff

102. Poultry Production. Laboratory practice in selection, judging, and other production problems. (1W) Staff
104. Incubation and Brooding. This course is designed to familiarize the student with the special problems involved in incubation or hatchery operation and the brooding, feeding and rearing of chicks. The advantages and disadvantages of battery, hot water, electric, coal burning, and gas brooders are emphasized. (2S)

105. Poultry Management. Problems of location of poultry farm, farm planning, renewing the flock, feeding, disease control, marketing, and other problems affecting labor income are studied in detail. Prerequisite: Poultry 1. (2S) (Not given in 1949-50)

106. Breeds and Breeding. A study of the origin and development of breeds and varieties of poultry and their adaptability to intermountain conditions; production of hatching eggs for commercial hatcheries; R. O. P. Breeding, and the National Poultry Improvement Plan; and important inheritance problems in poultry. Prerequisites: Poul. 1 or 101, and An. Hus. 15, or Zoo. 101. (3S) Given alternate years.

107. Poultry Feeds and Feeding. A study of nutrition problems, the feed and methods of feeding. Developing rations for special needs and for farm raising. Prerequisite: Poul. 1. (3W)

110. Poultry Products. Concerned primarily with the formation, structure, composition, processing, grading, storage, and distribution of poultry and poultry products. Industrial uses and proper care and handling of poultry by-products will also receive some consideration. Two lectures, one lab. (3S) (Not given in 1949-1950)

125. Special Problems. Special assignment to work out certain information on special problems. Prerequisites: Poul. 1, 104 and 107. Credit arranged. (W or S)

126. Seminar. Current poultry literature studies; assigned problems on special topics. (1W)

127. Advanced Poultry Practice. Special practice at the poultry yards. Prerequisites: Poul. 1, 104 and 107. Time and credit arranged. (W or S) Alder and Drake

Poultry Diseases. (See Veterinary Science 170.)


212. Research Problems in Poultry Breeding. Time and credit arranged. (2S)

214. Research Problems in Poultry Production. These problems will be in some phase of poultry production other than breeding or nutrition. Time and credit arranged. (2-5)

260. Animal Industry Seminar, Nutrition (1F)

261. Animal Industry Seminar, Breeding. (1W)

262. Animal Industry Seminar, Production. (1S)

Vegetable Crops

L. H. Pollard, Professor; E. Milton Andersen, Associate Professor; M. P. Leoniti, Research Assistant; L. R. Hawthorn, Alfred E. Clarke, Collaborators in Research. U. S. D. A.

Students majoring in Vegetable Crops must obtain a minimum of 18 hrs in Department Courses. In addition credit in the following courses is accepted toward a major in Vegetable Crops: Agricultural Economics 114; Agronomy 56, 107, and 109; Botany 120.

Students who plan to do graduate work may be admitted to the technical course in Vegetable Crops by permission of the Department Head and the Dean.
The Vegetable Crops Department offers work toward a Master of Science Degree in Vegetable Crop Production and Vegetable Breeding. The following courses may be used for graduate credit: 120, 121, 160, 161, 162, 163.

1. Vegetable Production. The methods of production, harvesting, storage, and processing of vegetables. (3F, W or S) Pollard and Andersen

2. Vegetable Production Laboratory. Designed to give practical experience in vegetable production. Field trips are taken to important production areas and vegetable processing plants. (1F or S) Pollard and Andersen

105. Major Vegetable Crops. Classification, identification, origin, history, types, and uses of our vegetable crop plants. Special emphasis on crops of major importance in Utah. This course alternates with 121. Prerequisite: Veg. Crops 1. (4) Pollard and Andersen

120. Vegetable Improvement. The fundamental principles and practices of plant breeding in the improvement of vegetables. Prerequisite: Agron. 109. (4S) Pollard

121. Advanced Vegetable Crops. A consideration of the economic, ecological and physiological factors underlying vegetable production, based on a study of experimental results. Prerequisites: Veg. Crops 1, 105; Agron. 56; Bot. 120. This course alternates with 105. (Not given in 1949-50) (4W) Anderson

130. Vegetable and Flower Seed Production. Methods and commercial possibilities of vegetable and flower seed production in Utah. A required field trip is taken into the seed producing areas of southern Idaho. (4F) Staff

160. Special Problems. Problems of production and breeding of vegetable crops and seed. Registration by permission only. (1-3 F, W or S) Staff

161, 162, 163. Seminar. Reports on research work and presentation of original papers. (1F, W, S) Staff

210. Research. Original research on vegetable crop and seed production or breeding problems for graduate students taking a major or minor in vegetable crops. (3-10 F, W or S) Staff

Veterinary Science

Wayne Binns, M. L. Miner. Associate Professors; H. Nielsen. Assistant Professor.

Courses in Veterinary Science are designed, not for training specialists in this field, but to complete the instruction of students in Animal Husbandry, Dairy Husbandry, Poultry Husbandry, and Bacteriology. Animal sanitation and disease control are emphasized. Pre-veterinary courses for those wishing later to obtain a veterinary degree elsewhere, may be taken.

20. Anatomy and Physiology of Domestic Animals. The anatomy and physiology of domestic animals in which the physiology of the digestive and reproductive systems is emphasized. (3F or W) Binns and Staff

120. Animal Hygiene. The principles and practices necessary to maintain the health of livestock. The causes, descriptions, control, and prevention of the prevalent diseases are also studied. (4S) Miner

170. Poultry Hygiene. The principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of the common diseases affecting poultry in this region. Taught alternate years. Not offered in 1950. (3S) Miner

200. Special Problems. Open to students who are majoring in some related field and who wish to study some particular phase of a disease in animals. Any quarter. Time and credit arranged. Staff

210. Research. Outlining and conducting research on animal diseases. Any quarter. Time and credit arranged. Staff
PRE-VETERINARY TRAINING

Students desiring to work toward a degree in Veterinary Medicine (D.V.M.) must have at least two years of pre-veterinary training at some authorized college or university. Because the large number of students in the United States desiring to study veterinary medicine, most students find it necessary to obtain a bachelor of science degree before they are accepted by a veterinary school. This is highly recommended because it gives the student a well-rounded background before starting the technical course. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry will complete the requirements for entrance into a veterinary school, except in some cases where additional chemistry, physics, and mathematics may be required. This school does not give a degree in veterinary medicine. Enrolled in veterinary schools is limited, and students from the state in which the school is located are given preference; therefore, students from this school must be well qualified to be accepted. A suggested three year pre-veterinary course has been drawn up. Any student wishing to take the prescribed pre-veterinary course and who fulfills the college 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.

Suggested Pre-Veterinary Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>Zoology 3, 4, 118</td>
<td>15</td>
</tr>
<tr>
<td>Chemistry 3, 4, 5, or 10, 11, 5</td>
<td>15</td>
</tr>
<tr>
<td>Organic Chemistry 121, 122, or 125, 126</td>
<td>10</td>
</tr>
<tr>
<td>Physics 20, 21, 22, or 6, 7</td>
<td>15 or 15</td>
</tr>
<tr>
<td>Mathematics 34, 35, and 44 or 46</td>
<td>13 or 13</td>
</tr>
<tr>
<td>Botany 24</td>
<td>5</td>
</tr>
<tr>
<td>Animal Husbandry 1, 10, 150, 151</td>
<td>15</td>
</tr>
<tr>
<td>Poultry 1, 2, or 101, 102</td>
<td>4</td>
</tr>
<tr>
<td>Dairy 1 or 108, or 110</td>
<td>3</td>
</tr>
<tr>
<td>English 10, 110</td>
<td>9</td>
</tr>
<tr>
<td>Agronomy 131, 132</td>
<td>6</td>
</tr>
</tbody>
</table>

It is recommended that the electives be taken in the Language and Art and Social Science groups as indicated in the catalog, pages 47 and 48.

Zoology

Zoology, Entomology, Physiology, and Nursing
Administered jointly by the School of Agriculture and the School of Arts and Sciences


In addition to course work the Department of Zoology, Entomology, Physiology offers excellent opportunities for research and graduate study in various phases of agricultural entomology, taxonomy and morphology of insects and parasitology. Frequently, further training and experience in these fields may be obtained by participation in the work of research projects of the Agricultural Experiment Station

Requirements for a Major in Agricultural Entomology:
SCHOOL OF AGRICULTURE

Zoology 3  Invertebrate Zoology
       4  Vertebrate Zoology
       112  Principles of Genetics
       106  Zoological Literature
       116  Parasitology
Entomology 13  General Entomology
       101  Insect Morphology

102, 103  Systematic Entomology
108  Agricultural Entomology
115  Medical and Veterinary Entomology
120  Insect Pollination in Relation to Agriculture
125, 126  Seminar
156  Chemistry of Insecticides and Fungicides

See Zoology under School of Arts and Sciences, for course descriptions.
SCHOOL OF ARTS AND SCIENCES

CARLTON CULMSEE, Dean

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Bacteriology and Public Health .................................................. 99
Botany and Plant Pathology ....................................................... 100
Chemistry .................................................................................. 101
English and Journalism ............................................................. 105-108
Geology ...................................................................................... 110
History ........................................................................................ 112
Landscape Architecture and Planning ......................................... 113
Mathematics ............................................................................... 113
Military Science and Tactics ....................................................... 115
Modern Languages and Latin ..................................................... 116
Physics ......................................................................................... 118
Speech and Drama ...................................................................... 121
Zoology, Entomology, Physiology and Nursing .......................... 125
General Information

In addition to training students to carry on their work in the technical divisions of the Institution, the School of Arts and Sciences offers opportunity to all the students of 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 in history been so urgent as now. Such understanding is the surest path to permanent peace in the postwar world. Many of the courses in Arts and Sciences qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of Arts and Sciences also enable properly qualified students to major in its departments and thus begin preparation for a career.

The School of Arts and Sciences includes the departments of Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, English and Journalism, Geology, History, Landscape Architecture and Planning, Mathematics, Military Science and Tactics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology, Physiology, and Nursing.

SUGGESTED COURSES FOR FILLING GROUP REQUIREMENTS

The need of a general education which includes the elements necessary to an understanding of the universe and man's place in it is widely recognized. Below is an attempt to help students satisfy group requirements in such a way that they will not neglect certain subjects regarded as essential in a basic education. Majors in Arts and Sciences departments are urged to fill their groups from the following courses:

1. Biological Science:
   Botany 1 or Zoology 1 (Principles of Biology) ... 5 credits
   Bacteriology 1 and 2 or Physiology 4 ... 5 credits

2. Exact Science (at least 10 credits):
   Physical Science 31 and 32 (in Chemistry, Geology, Mathematics, or Physics)

3. Language and Arts (at least 10 credits):
   English—Any Lower Division Literature course
   Language—Any beginning course in French, German, Portuguese, Spanish, or Latin.
   Speech—Any Lower Division course.

4. Social Science:
   History 4 (World Civilizations) ... 5 credits
   Pol. Sci. 1 (Government and the Individual) ... 5 credits
   or
   Pol. Sci. 10 (American National Government) ... 5 credits

In addition it is urged that students add to their liberal education by electing courses in Art or Landscape Architecture and Planning, Music, Economics, Psychology, and Sociology.

See pages 43 and 44 for general group requirements.

PRE-MEDICAL TRAINING

The School of Arts and Sciences offers the necessary courses to provide a pre-medical training which will satisfy the entrance requirements of Medical Schools of the United States and Canada.
### SUGGESTED PRE-MEDICAL SCHEDULE

#### Freshman Year

(Lower Division)

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<th>Course</th>
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<td>Chem. 3, 4, 5</td>
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<td>5</td>
<td>3</td>
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<tr>
<td>Math. 34, 35, 44</td>
<td>3</td>
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<tr>
<td>English 40 or 52</td>
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<tr>
<td>Military Science</td>
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<td>Electives</td>
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#### Sophomore Year

(Lower Division)

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<td>English 10</td>
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<td>Physics 20, 21, 22</td>
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<td>Chem. 15 or 115</td>
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<td>Electives</td>
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#### Junior Year

(Upper Division)

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<td>Chem. 121, 122 or 125, 126</td>
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<tr>
<td>Zoology 118, 119</td>
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<tr>
<td>English 110</td>
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<td><strong>Total</strong></td>
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Recommended electives are Scientific Vocabulary (Engl. 5), Psychology, Heredity, College Grammar or Technical Writing, History, Political Science, Sociology, and Economics.

Pre-medical students interested in graduation from this College before attending medical school may major in Chemistry, Physics, Zoology, or other related fields. For the pre-medical major in Zoology, see introduction to Department of Zoology, Entomology and Physiology.

### PRE-DENTAL TRAINING

Students planning to go into the profession of Dentistry may take the necessary courses in the School of Arts and Sciences to satisfy the requirements for admission to any of the Schools of Dentistry in the United States.

### SUGGESTED PRE-DENTAL SCHEDULE

#### Freshman Year

(Lower Division)

<table>
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<th>Course</th>
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<td>Zoology 3, 4</td>
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<td>English 40 or 52</td>
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<td>1</td>
<td>3</td>
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<tr>
<td>Military Science 1, 2, 3 or P. E.</td>
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<tr>
<td>Electives (optional)</td>
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</table>
School of Arts and Sciences

Sophomore Year

(Lower Division)

Chemistry 121, 122 or 125, 126 ........................................ F 5
Physics 20*, 21*, 22* ....................................................... 5
Zoology 118 ........................................................................... 5
English 10, 110 ...................................................................... 5
Military Science 4, 5, 6, or P. E. ............................................ 1
Electives (optional) .................................................................. 1

Total ............................................................... 17

* A number of the Schools of Dentistry require a minimum of only 9 or 10 credits of physics. Students planning to enter one of these schools may take Physics 5 and 7 instead of Physics 21, 22, and 23, and in this case, Mathematics 35 and 45 may be omitted.

Recommended electives are Psychology, History, Political Science, Sociology, Economics, and English.

Students planning to receive a B. S. degree on a combined curriculum (three years here and one year in a Medical or Dental school) must fulfill the group and composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

Cadet Pre-Nursing Training

Under the Bolton Act, and in cooperation with the Logan L. D. S. Hospital, the College is offering the fundamental academic courses preparatory to nursing training in the National Cadet Nursing Training program. The academic course covers a period of two quarters.

Persons interested in the pre-nursing training program should address inquiries to Professor Merrill Gunnell at the College or to the Superintendent of Nursing Training, Logan L. D. S. Hospital, Logan.

B. S. Degree for Nurses

Through a joint program offered by Utah State Agricultural College and Logan L.D.S. Hospital, girls may earn both a Bachelor of Science degree and Registered Nurse credentials in four calendar years of study. Part of the time is spent at the College, part of it at the hospital in Logan, and part at Denver General Hospital. Persons interested in the program should address inquiries to the Division of Nursing at the College or to the Superintendent of Nursing Training, Logan L.D.S. Hospital, Logan. See Division of Nursing in Zoology, Entomology, Physiology, and Nursing Department, School of Arts and Sciences.

Bacteriology and Public Health

Administered jointly by the School of Agriculture and the School of Arts and Sciences

J. E. Greaves, Professor Emeritus; W. Whitney Smith (Chairman), W. B. Preston, Professors; John H. Carliquist, G. Albin Matson, Special Professors; K. R. Stevens, Associate Professor; L. W. Jones, Assistant Professor; Ann Burns, Instructor; E. H. Bramhall, Special Instructor.

Bachelor of Science Degree in Bacteriology and Public Health

See pages ______ and ______ for courses that may satisfy group requirements. Students majoring in General Bacteriology should take: Bact.1 or 70, 2 or 71, 104 plus 105 or 120, 110 or 170, 160, 180, 191, 192, 193; Chem. 190 or 191 plus prerequisites; Math. 35, 44; Physics 21, 22 (6 and 7 will be accepted in special cases); Public Health 50; Zool. 3, 4.
Students majoring in Clinical (Medical Laboratory) Technology should take during their first, second, and third years: Bact. 1 or 70, 2 or 71, 107, 131, 132, 160, 162, 154, 166, 167, Chem. 10, 11, 12, 190, 192; Physiol. 4, 10; Physics 6, 7; Public Health 50; Zoology 3, 4, 115, 117, plus all college Group, English, Military and Physical Education requirements. 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 and 139. Utah State Agricultural College has made provisions for the instruction of laboratory technicians in this internship in the Wm. H. Groves L.D.S. Hospital in Salt Lake City. During this fourth year, students will register and pay for three of the four required 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 qualifying examination given by the American Society of Clinical Pathologists. (Consult W. W. Smith for further details.)

Students majoring in Public Health shall take: Public Health 50, 51, 52, 153, 155, 155; Bact. 1, 2, 131, 160, 162, 164, 166; Chem. 10, 11, 12, 190; Physiol. 4, 10; Physics 6, 7; Zool. 3, 4, 111, 116. Except for those who find employment as Sanitarians, a Bachelor’s Degree should always be followed by Graduate work.

Students majoring in Health Education should consult Professors H. B. Hunsaker or W. W. Smith

Master of Science Degree in Bacteriology

The Bacteriology and Public Health Department offers opportunity for research and graduate study leading to a Master of Science Degree in various specialized fields. The research and graduate possibilities in these various fields are greatly augmented through the cooperation of the United States Department of Agriculture.

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Bacteriology: 107, 110, 120, 144, 162, 164, 166, 167, 170, 180.

For graduate students in other departments the following courses in the 100 series may be modified and used for graduate credit: Bact. 104, 107, 110, 120, 140, 144, 150, 162, 164, 165, 167, 170, 180, and Public Health 144, 151.

Courses numbered over 200 are largely restricted to graduate students

See Bacteriology and Public Health in the School of Agriculture for course listing.

Botany and Plant Pathology

Administered jointly by the School of Agriculture and the School of Arts and Sciences

B. L. Richards, F. B. Wann, Professors; E. L. Waldee, W. S. Boyle, Associate Professors; George W. Cochran, Associate Research Professor; Arthur H. Holmgren, Assistant Professor and Curator of the Intermountain Herbarium; R. A. Bush, Instructor; Bassett Maguire, Curator New York Botanical Garden, Non-Resident Professor; Orson S. Cannon, Bryce N. Wadley and George Kaloostian, Collaborators, U. S. Department of Agriculture.

Bachelor of Science Degree in Botany

Course requirement for a major: 24, 25, 30, 116, 117, 120, 130, 150.

Course requirement for a teaching major: 24, 25, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology 121, 131, 135, 151; Taxonomy, 104, 108, 112; Physiology, 121, 224, 228; Cytology, 116. See pages 47 and 48 for courses that may satisfy group requirements.
Master of Science Degree in Botany

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

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 151.

The following courses may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 131, 135, 150, 151.

See Botany and Plant Pathology in School of Agriculture for course listings.

Chemistry


The degree of Bachelor of Science in Chemistry is a professional degree and graduates must meet the minimum requirements of the American Chemical Society in addition to fulfilling the group requirements of the College as given on pages 47-48 of this catalog. To aid the student in registering, the following suggested schedule is given.

Suggested Schedule

Freshmen

A. For students having completed 1½ units of high school algebra and ½ unit of geometry:

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem. 3, 4, 5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Math. 35, 46, 97</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Group requirements in biological and/or social sciences</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Physical Education or Military Science and Tactics</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

B. For students who enter college with credit for only ½ unit of algebra and ½ unit of geometry:

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
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<tbody>
<tr>
<td>Chem. 3, 4, 5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Math. 34, 35, 46</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Group requirements in biological and/or social sciences</td>
<td>5</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>Eng. 10 or 11 (special petition must be made to take this course in freshman year)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Education or Military Science and Tactics</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

Sophomores

A. For students with mathematics:

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 98, 99</td>
<td>5</td>
<td>5</td>
<td>—</td>
</tr>
<tr>
<td>English 10 or 11</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Physics 20, 21, 22</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry 17, 18, 19</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Lower Division requirements</td>
<td>1</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>Physical Education or Military Science and Tactics</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>
NOTE: Five credits lower division group requirements must be completed in junior year.

B. For students with incomplete mathematics:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Math 97, 98, 99</td>
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</tr>
<tr>
<td>Physics 20, 21, 22</td>
<td>5</td>
</tr>
<tr>
<td>Chemistry 17, 18, 19</td>
<td>4</td>
</tr>
<tr>
<td>Lower division group requirements</td>
<td>3</td>
</tr>
<tr>
<td>Physical Education or Military Science and Tactics</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Chemistry 121, 122, 123</td>
<td>F</td>
</tr>
<tr>
<td>German</td>
<td>7</td>
</tr>
<tr>
<td>Electives in geology, biology, social science, English lit.</td>
<td>5</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 104, 105, 106</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry 109, 110, 111</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry 135</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry 160</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry 191</td>
<td>1</td>
</tr>
<tr>
<td>English 111</td>
<td>4</td>
</tr>
<tr>
<td>Physics 120, 121, 130</td>
<td>3</td>
</tr>
<tr>
<td>Electives (must include at least 3 credits adv. chem.)</td>
<td>6</td>
</tr>
</tbody>
</table>

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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. In addition to the graduate courses (in the 200 series) courses 116, 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 committee chairman approves.

Before admission to candidacy for the Degree all graduate students will be 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.

1. **Introductory Chemistry.** Designed to give a broad view of the cultural aspects of chemistry. This is a terminal survey course and cannot be used as a prerequisite for advanced courses in chemistry. (SF) **Staff**

2. **Chemical Principles and Qualitative Analysis.** An introduction to chemical theory and the principles of chemistry including introductory qualitative analysis in the spring quarter. Prerequisites: high school chemistry or physics, algebra and geometry. This course is designed for science majors, pre-medical and pre-dental majors and home economics majors in foods and nutrition. Three lectures, two labs. (SF. SW, SS) **Maeser**

10. **General Chemistry.** An introduction to the fundamental principles of inorganic and organic chemistry. A one-year terminal course open to any matriculated student. Students with a grade of B or better may enter Chemistry 5 in the spring quarter. (SF. 5W, 5S) **Staff**

11. **Chemistry 15 or 115.** The basic theory and laboratory practice of quantitative analysis for premedical and pre-dental majors. Prerequisite: Chem. 5 (SF) **Cannon**
17, 18 or 117, 118. Quantitative Analysis. Theory and practice of gravimetric and volumetric analysis. A terminal course for majors in agriculture and home economics. Prerequisite: Chem. S. (4F, 4W) Cannon

19 or 119. Quantitative Analysis. A continuation of Chemistry 18. Required of chemistry majors. (3S) Cannon


104, 105, 106. Physical Chemistry. Including atomic, kinetic, and electron theories, gaseous liquid and solid state; solutions and thermodynamics. Prerequisites: Physics 20, 21, 22; Chem. 5; Math. 98. (3F, 3W, 3S) Maeser

107, 108. Dairy Chemistry. The chemistry of milk and milk products including tests for adulterants, preservatives, and routine quantitative methods of analysis of dairy products. Prerequisites: Chem. 12 or 122. (4F, 4W) Hill

109, 110, 111. Physical Chemistry Laboratory. To accompany Chemistry 104, 105 and 106. (1F, 1W, 1S) Staff

116. Inorganic Preparations. A laboratory course in practical laboratory methods of synthetic inorganic chemistry. Prerequisites: Chem. 5 and 103. Any quarter. Time and credit arranged. Maeser

121, 122. Organic Chemistry. An introductory course in the fundamentals of the chemistry of the carbon compounds. Prerequisites: Chem. 5 or a grade B or better in Chem. 12. (5F, 5W) Burton

123. Organic Chemistry. A continuation of Chemistry 122 covering more advanced theories and reactions. Prerequisite: Chem. 122. (SS) Burton

124 or 224. Organic Preparations. An advanced laboratory course in the synthesis of more complex compounds. Prerequisite: Chem. 123. (3F) Burton

125, 126. Applied Organic Chemistry. Biological applications are emphasized. Designed especially for students in Agriculture, Home Economics, and Nutrition. Chem. majors should register in Organic Chem. 121 and 122. Prerequisite: Chem. 5 or 11. (5F, 5W) Hill

132 or 232. Colloidal Chemistry. Chemistry of colloids and their relationship to the vital processes in plant and animal life. Prerequisite: Chem. 122. A background in Physical Chem. is desirable. (3) Time arranged. (To be offered 1949-50) Staff

133 or 233. Colloidal Chemistry Laboratory. Accompanies Course 132. Time and credit arranged. Staff

134 or 234. Qualitative Organic Analysis. The classification, reactions and laboratory work involved in identification of unknown organic compounds. Prerequisites: Chem. 19 and 123. (3S) (To be offered 1950-51) Burton

135. Chemical Literature. The types of information available in technical publications; exercises in finding, assembling and using such information. (3F) This course should precede or accompany English 111.) Burton

140 or 240 Physico-Chemical Methods. An advanced laboratory course. Any quarter. Time and credit arranged. Maeser

150 or 250. Advanced Inorganic Chemistry. Based on the periodic table and atomic structure. Designed for Chemistry seniors and graduates and others with similar training. (3W) Maeser

155. Glass Blowing. A laboratory course in the technique of manufacture and repair of laboratory glassware. For Chemistry majors. Others admitted only by special permission. Class limited to five students. (2W) Burton

156 or 256. Chemistry of Insecticides and Fungicides. Designed especially for advanced students in entomology, plant pathology, and agriculture; deals with the chemical composition, stability, toxicity, and effectiveness of commercial insecticides and fungicides. Prerequisite: Chem. 12 or 122. (2W) Hill

160, 260. Seminar. (1F, W or S) Time arranged. Staff
170. 270. Chemical Microscopy. Lecture and laboratory practice in the use of the microscope and its accessories as applied to chemistry. Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and analysis of minute amounts of material. Prerequisite: Physical Chem. or special permission. (2 or more; W) (To be offered 1950-51) Cannon

171. 271. Quantitative Micro-Analysis. Laboratory practice and lecture in the use of the micro-chemical balance, micro-analysis of carbon, hydrogen, halogens, sulphur, phosphorous, Kjeldahl and Dumas nitrogen, micro molecular weight determination. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (2 or more; S) Cannon

172. 272. Optical Methods of Chemical Analysis. Lecture and laboratory problems in spectroscopy, spectrophotometry, colorimetry, refractometry and microscopy. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3F) (To be offered 1950-51) Cannon

173. 273. Electro-Chemical Methods of Analysis. Lecture and laboratory instruction in Potentiometry, Polarography, Electro-analysis, and related methods as applied to Analytical Chemistry. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3W) (To be offered 1949-50.) Cannon

174. 274. Advanced Quantitative Analysis. An advanced course illustrating the techniques and practices in the analysis of complex substances, such as rocks, minerals, gases, water supplies, etc. Prerequisite: Chemistry 19 or 119. Spring. Time and credit to be arranged. (To be offered 1950-51.) Cannon

90 or 190. Elementary Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins, and hormones and their transformations in plants and animals. Prerequisites: Chem. 12 or equivalent. For students not majoring in Chemistry. (SF) Greenwood

189 or 289. Animal Metabolism. Feeding experiments involving the 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.

191 or 291. Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins and hormones and their transformations in plants and animals. Prerequisite: Chem. 122 or equivalent. For students majoring in Chem. and others with adequate background in Chemistry. (SS) Greenwood

192 or 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: Chem. 190 or 191 or equivalent. (3F) Greenwood

193 or 293. Biochemistry. Preparations of enzymes or amino acids as arranged. Prerequisite: Chem. 109 or 191. Time and credit arranged. Any quarter.

194 or 294. Biochemistry. Microbiological and colorimetric methods for determination of vitamins and amino acid in plant and animal tissues. Prerequisites: Chem. 190 or 191 and Bact. 70 or 71. (3W) Greenwood

195 or 295. Advanced Biochemistry. Carbohydrates, proteins, fats and minerals and their metabolism in plants and animals. Prerequisite: 190 or 191. (2P) Greenwood

196 or 296. Advanced Biochemistry. Enzymes and their role in plants and animals. Prerequisite: Chem. 190 or 191. (2W) Greenwood

197 or 297. Advanced Biochemistry. Vitamins and hormones and their function in plants and animals. Prerequisite: Chem. 190 or 191. (2S) Greenwood

198 or 298. Research. Senior or graduate students majoring in chemistry may elect research in any branch of the subject. Any quarter. Time and credit arranged.

225, 226, 227. Advanced Organic Chemistry. Lecture course for graduate students. Outstanding seniors may register by special permission. Course includes modern theories and special topics in organic chemistry. Prerequisites: Chem. 123, 106. (2F. 2W. 2S) Burton
English

Wallace J. Vickers, Chairman; King Hendricks, Carlton Clumsee, Professors; Ira N. Hayward, Hubert W. Smith, Wendell Keck, Associate Professors; Moyle Q. Rice, Alice Senob, Stanley P. Andersen, Assistant Professors; Pearl S Budge, Willard Heed, Veneta Nielsen, Dan H Ludlow, Instructors.

See pages 47 and 48 for courses which may satisfy group requirements.

**English Major Requirements**

Students who intend to major in English must complete English 1, 10, 53, 60, and 61 before beginning work on the required upper-division courses. It is highly desirable to complete History 34 and at least one year of foreign language during the freshman and sophomore years.

English 105, 110, 118, or Journalism 112, 162, 163, 196; two period courses (161, 175, 180, 190, 191), one additional literature course numbered above 120, and at least 21 credits of a foreign language are required of majors in English. Of these 21 credits, 18 may be used as a minor. English 123, The Teaching of English, is recommended for English majors and teaching majors in English. Students must also maintain a "B" grade average in their major subjects. Teaching majors in English meet the same requirements except foreign language.

Students whose major interests are divided between English and Speech may take a composite English-Speech major. Such a major relieves the student of all requirements for a minor. English-Speech majors should take English 1, 53, 118, 119, 163, 180, 190, 191; Journalism 12 (three credits) and 112; Speech 150 (6 credits); 10 credits of Interpretation, including 124; and 10 credits of Public Speaking, including either 25 or 109; 10 credits of Speech corrective work; and Speech 123.

A. **Drill in Essentials of English.** To assist students with English deficiencies. Students whose standings in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10. (3F, W or S) Daily. **Staff**

B. **English for Foreign Students.** To assist foreign students in gaining a sufficient command of the language to read textbooks with comprehension and to participate effectively in classroom activities. It is required of all foreign students failing to make required scores on English proficiency examinations administered at time of entrance into the College. Other foreign students may take the course as an elective. (3F, W or S) **Smith**

C. **English for Foreign Students.** A continuation of English B; required of students who have completed English B and who in the judgment of the instructor require further special training in the language. Other foreign students may take the course as an elective. (3W or S) **Smith**

1. **College Grammar.** (5P or W) Vickers

2. **Mechanics of Writing.** A drill course in the fundamentals of sentence structure, word usage, punctuation, and spelling, with emphasis on correct diction and grammar as aids to precision in writing. (3F, W or S) Ludlow

5. **Scientific Vocabulary.** A study of word formation and derivation as a means of understanding scientific terms and of acquiring a vocabulary. (3 F, W or S) Keck, Andersen

10. **Sophomore Composition.** Required of all students not offering its equivalent. May not be taken in the freshman year. Emphasizes correctness and effectiveness in sentence, paragraph and theme; gives practice in organization and outlining of material, and in expository writings; demands clear, forceful expression, and requires a full third of a student’s time. (5F, W or S) **Staff**

11. **Sophomore Composition.** Should be taken in place of English 10 by sophomores whose record in the placement test indicates special aptitude in composition. Open only to students whose placement cards are marked "Eligible for English 11." (3P, W or S) Andersen and Nielsen

*On leave*
17. 18. 19. Freshman English. For Forestry, Engineering and Technology students only. Drill in fundamentals of sentence and paragraph structure. Exercises in grammar, vocabulary, and spelling. Composition, with stress on intelligent thinking and clear expression. Practice in writing letters and reports. (3F. 3W. 3S) Staff

20. Masterpieces of Prose. Fiction, essay, biography. (5F) Senob

21. Reading in Poetry. To develop appreciation for poetry. Verse forms, the various types of poems, and the idea underlying lasting poetry are considered. (5F, W or S) V. Nielsen and Vickers

24. Children's Literature. Introduction to the prose and poetry of childhood and adolescence. Helpful to teachers and parents (4F, W or S) Smith and Carter

25. The Nineteenth Century Novel. Analysis of the novels of Scott, Austen, Thackeray, Cooper, and Hawthorne. (3F) Smith


27. The Nineteenth Century Novel. Analysis of the novels of Hardy, Meredith, Howells, James and Turgenev. (3S) Smith

28. Contemporary American Poetry. The principal American poets since 1900. The purpose is to help students enjoy and understand poetry as a living art. (3F) V. Nielsen

29. Contemporary British Poetry. (3S) V. Nielsen

31. Floating Poetry. The poetry that has lived in the oral tradition since medieval times. The course is divided into four parts: the narrative ballad, the non-narrative poem, Negro poetry (including slave songs and spirituals), and children's poetry. (3) Hendricks

33. Contemporary Short Story. The technique of the short story. English, American, and European stories are analyzed. Encouragement is given to those who wish to write. (3) Rice

34. Nineteenth Century Short Story. (3) Rice

37. The Essay. Writers of the present—American and English. (3) Rice

40. World Literature. A survey course including a study of epic and romance, tragedy, comedy, satire, etc., as these forms have appeared in Greek, Roman, Hebrew, Italian, French, German, English and American literature. (5F, W or S) V. Nielsen

43. Scandinavian Literature (In Translation). Selected readings from recent and traditional writers: short stories, novels, poetry. (3S) M. L. Nielsen

45. Readings in Philosophical Literature. Selected readings in the great philosophers from Plato to the present. (5W) Hayward

46. The Bible as English Literature. Provides an opportunity for first hand acquaintance with the great book of books. (5S) Vickers

47. Readings in Greek Literature. Provides an opportunity to become acquainted with Greek epics and dramas. (5) Vickers

48. Readings in Drama. Selected masterpieces of Continental, British, and American drama from the Renaissance to the present. Emphasis is placed upon the theatre as the medium of a popular art form, reflecting cultural and social ideas of its time. (5) Hayward

51. Early American Literature. Our National Literature from Colonial times to Herman Melville. (3W) Hayward

52. Later American Literature. American Literature from Walt Whitman to the present. (3S) Hayward

53. American Literature. Survey of American literature from the beginnings to the present, with emphasis on works expressing the democratic spirit or in other ways portraying ideas characteristic of American culture. Open to English majors or minors and to majors and minors in other departments by permission of the instructor. (5F) Hayward
54. American Biography and Autobiography. To introduce American biography and autobiography as an enjoyable and important form of literature and as a source of valuable sidelights on American thought and culture. (3S)  
Hayward

55. American Novel. Writings of principal American novelists from Charles Brockden Brown to present. Emphasis on the novel as a form of art portraying and interpreting the American scene, past and present. (3)  
Hayward

56. American Drama. The development of American drama from Revolutionary times to the present. The principal plays are studied in light of literary and social theories of the times in which they were written. (3S)  
Hayward

57. Whitman and Sandburg. A study of the attempts of two poet-philosophers to catch the American spirit—one writing with the surge of the frontier, the other writing in its wake. (3W)  
Andersen

Staff

59. English Literature. A survey of English masterpieces of the period from Wordsworth to the twentieth century. (5S)  
Staff

60. Shakespeare. Offers the opportunity to gain a general knowledge of Shakespeare by reading a liberal number of his plays and participating in class discussions upon them. (3F)  
Staff

61. Wordsworth. (3)  
Senob

62. Shelley. His relation to the Romantic movement. (2)  
Rice

63. Browning. Chiefly a study of his monologues and selected dramas. (2S)  
Andersen

64. Contemporary Novels. Reading and interpretation of the best twentieth century novels. (3F, W or S)  
Andersen and Smith

65. History of the English Language. The evolution of the English language from Anglo-Saxon times to present. (3W)  
Hendricks

66. Advanced Composition. For students who have taken English 10 or 11; may be taken in place of English 19 by students who have received credit for 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 material. (4F, W or S)  
Staff

67. Technical Writing. Emphasis upon bibliography, research methods, and final form of the technical report. (4F, W or S)  
Keck, Hendricks

68. Juvenile English. An advanced course more general in nature than English 111. Designed for students in Forestry or Engineering who do not anticipate doing research writing. (4F, W, or S)  
Keck

69. Writer's Workshop. For students who desire special assistance in imaginative writing. Admission is granted to all who show a particular talent in the writing of prose or verse, but prospective students are required to consult the instructor before registering. (2F, 2W, 2S)  
Culmsee

70. Creative Writing. Short stories, essays, poetry. Considerable freedom of choice as to type. To register, consult instructor. (3F)  
Andersen

71. (Education 123.) The Teaching of English. A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study both materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. Satisfies part of the education requirement for teachers' certificate. (3W)  
Hayward

72. Literary Criticism. Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4W)  
Senob

73. Modern Literary Criticism. Critical essays since Croce, with particular attention to T. S. Eliot and the modern American School. (4)  
Culmsee
143. Soviet Literature in Translation. Literature produced in Soviet Russia between 1918 and the present. Special emphasis on works of Gorki, A. Tolstoi, Ehrenburg and Sholokov. (5) Hendricks


157. Poe and Whitman. Poetry and prose. Poe is studied as a pioneer artist and critic in poetry and the short story; Whitman as exponent and champion of American democracy. (3) Hayward

158. Hawthorne and Melville. Essays, tales and novels. Emphasis upon political, social, and philosophical ideas. (3) Hayward

159. Emerson and Thoreau. Essays, lectures, and poetry of the two principal figures of the Concord Group as representatives of the literature and thought of their time and as thinkers whose ideas are still important. (3S) Hayward


162. Chaucer. Relation of Chaucer to his time; his influence upon subsequent literature. Emphasis upon oral reading. (5W) Staff

163. Shakespeare. Six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. (5S) Staff

164. Elizabethan Playwrights, Exclusive of Shakespeare. Plays selected from Marlowe, Dekker, Johnson, and others. (4F) Senob

167. Arthurian Legends. The legends and their relation to English Literature. (3S) Nielsen

168. Modern Drama. Reading and interpretation of the best plays, Continental, English, and American, from Ibsen to the present (5) Smith

170. Milton. Selected prose and poetry with emphasis on Paradise Lost. (5) Vickera

175. Elizabethan and Stuart Literature. Poetry and prose works, exclusive of those of Shakespeare and Milton from 1568 to 1660. (5S) Senob

180. The Eighteenth Century. A comprehensive study of the literature from 1660 to 1798. (5) Keck

181. Eighteenth Century Essays. The development of the essay from the "Taller" until the emergence of the critical reviews of the late 18th century. (2) Keck

185. Eighteenth Century Novels. The major works of Defoe, Richardson, Fielding, Smollett, Sterne, and Goldsmith. (3) Keck

186. Restoration Drama. Principal plays of the Restoration, 1660-1706. (2F) Senob

187. Eighteenth Century Drama. Plays and players from the Augustan period until the end of the century. (2F) Keck

188. English Hymnology. Literature and musical backgrounds of the rise of the English hymn from the 16th century psalmmodists until the early 20th century. (3W) Keck

189. Eighteenth Century Poetry. Poetry and critical theories of composition from the age of Pope until the Romantic period. (3) Keck

190. Romantic Period. A brief study of the precursors of romanticism; a study of the literature from 1790-1832, with emphasis on poetry. (5W) Smith

191. The Victorian Period. A comprehensive review of the literary influences and personalities of the period with emphasis on the chief poets and prose masters of the age. (5) Smith
193. Arnold. (2)

195. Readings and Conference. Time and credit arranged. Any quarter. Limited to English majors. Instructor's approval required. Staff

196. Methods and Materials for English Study. Intended to introduce English majors to approved methods of advanced study in English. Major emphasis is on use of library, compilation of bibliographies, and writing of course papers. Required of all English majors in the junior year. (3F) Hayward

200. Thesis. Time and credit arranged. Staff

203. Tragedy. A study of the theory and practice of tragedy from Aeschylus to the present. (5) Vickers

204. Comedy. A study of the theory of comedy and of the use of comedy in various literary forms. (5W) Vickers

247. Seminar in Comparative Literature of the 18th Century. Research studies will be conducted in the inter-relations of English and continental literature between the years 1700 and 1832. Time arranged. (5) Hendricks


261. Readings in Middle English. Middle English Metrical Romances. (4) Hendricks

280. Seminar. An intensive study of special problems in 18th century literature. (4) Keck

290. Seminar, Nineteenth Century Literature. An intensive study of special problems and selected writers of the period. (4) Smith

JOURNALISM

Major students in Journalism should complete Journalism 12, 13, 14, 16, 64 or 156, 81, 112, 125, 114, 115, 125; English 1, 5, 10, 52 or 53, 110, 117 or 118 or 119.

They are urged to complete as many of the following as possible: English 40, 46, 60, 61, 63, 105, 134. It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, History, Modern Languages, Political Science, Psychology, Sociology, Speech.

4. Exploring Journalism. Discussions of opportunities in journalistic vocations and qualifications for success in these fields. Practice in various types of writing to enable students to estimate aptitudes and interests. (2F) Culmsee

12. Reporting. Lectures, practice, and group discussion on work of reporter and correspondent. Students are required to cover assignments for college, local, and state newspapers. (3F) Nelson

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) Nelson


16. Copyreading. Primarily a laboratory course in handling of newspaper copy, headline, page layouts. Prerequisites: Journalism 12, 13. (3S) Anderson

51. General Photography. (See Commercial Photography Department for description. (3F, W or S) Anderson

64. 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. (3W) Anderson

81. Introduction to Radio. (See Speech Department for description.) (3F)

82. Radio Speech. (See Speech Department for description.) (3W) B. Hansen

83. Elements of Broadcasting. (See Speech Department for description.) (3S) B. Hansen
112. The Writing of Feature Articles. Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals will be made to determine available markets and what editors will buy. (3W) Culmsee

114. Writing for Radio. Study and practice in writing information and interpretative continuity for radio programs. (3S)


120. Agricultural Journalism. Problems of writing for, editing, and publishing weekly newspapers and magazines. Emphasis on writing farm and home news. Intended to aid agricultural extension workers and others in preparing material for rural publications. (3S) Culmsee

124. Public Opinion and Propaganda. (See Political Science 124.) (3S)

125. Editorial Page. A study of editorials and other elements of the modern editorial page, and the writing of editorials. (3F) Andersen

131. Writing About Science. Techniques in the informal presentation of scientific information to ordinary people. For science majors who wish to write intelligibly about their fields as well as for journalism majors. Familiarity with basic scientific procedures and with some research problem is very helpful. (3F) Andersen

151. Photographic Problems. (See Commercial Photography Department for description.) (3F, W or S) Allen

156. Principles of Advertising. (See Merchandising Department, School of Commerce, for description.) (5W)

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. (5S) Andersen and B. Hansen

183. Radio Programming for the Rural Audience. (See Speech Department for description.) (3W) B. Hansen

Geology

J. Stewart Williams, Willard D. Pye, Professors; Stanley J. Thayne, Instructor.

Geology Club: The Geology Club, an organization of geology students under the supervision of the Geology Department meets in the lecture room of the Department at 8:00 p.m. on the second Thursday of each month. The programs consist of talks by guests, faculty members, and students. All interested persons are invited to attend. Regular attendance is required of all geology majors.

Major in Geology: The following courses, or their equivalents, outside the Department of Geology, are required of Geology majors: Chem. 3, 4, and 5; C. E. 82, 84, and 85; English 110 and 111; Physics 20, 21, and 22; Math 35, 97, 98, and 99. The following courses in the department are required of majors: 1 or 3, and 2; 101, 102, 106, 108, 110, 112, or 113, 114, 115, and 120.

Field Trips: Since field work is a very essential part of the study of Geology, majors should be prepared to devote most of the Saturdays during the Fall and Spring quarters to this work. Two longer field trips, each of several days' duration, are taken each year, one in the Fall quarter and one in the Spring quarter. Majors should plan to take as many of these trips as possible, and attendance on the majority of the trips is required for a major.
Master of Science Degree in Geology

The Geology Department offers work toward the Master of Science degree in the fields of invertebrate paleontology, stratigraphy, areal geology and ground water geology. The following courses in the 100 series may be used for graduate credit by students majoring in the department of Geology: 102, 103, 107, 112, 113, 116, 117.

Any or all courses in the 100 series may be used for graduate credit by students in other departments.

1. Introductory Physical Geology. A general survey of physical geology for art students and others who desire only a broad introduction to the subject. This course is continued in Geology 2, for which it is a prerequisite. Closed to students who have had Geology 3, or equivalent. A one-day field trip is required in Fall and Spring quarters. (5F, W or S)

2. Introductory Historical Geology. A continuation of Geology covering historical geology. Prerequisite: Geol. 1. (5W) Williams

3. Physical Geology. For forestry, engineering, and soils students and others who desire a substantial introduction to physical geology. Not open to students who have taken Geology 1 or equivalent. A five dollar deposit is required for loss and breakage of equipment. A one-day field trip required. (5F, W or S) Williams

31. 32 Physical Science. Principles essential to understanding of physical universe. Elements of basic physical sciences integrated for use in interpreting human experience. (SW. SS)

101. Mineralogy. Identification of the common minerals by means of physical and chemical tests. Elementary crystallography. Prerequisites: Geol. 3 and Chem. 3, 4, and 5, or equivalents. (5F)

102. Optical Mineralogy and Petrography. Optical properties of the common rock-forming minerals, and identification of these minerals in thin-sections and in refractive-index media with the petrographic microscope. Introduction to the classification of rocks, and correlation with the field classification. Prerequisites: Geol. 101 and Physics 22. (5W)

103. Engineering Geology. The application of geology to engineering problems. For seniors in Engineering. (SW)

104. Regional Geology of the United States. Major geological structures and land forms of the physiographic provinces of the United States that have influenced exploration, settlement, and industrial development. Prerequisite: Geol. 1 or 3, or equivalent. (2½ S) Staff

106. Invertebrate Paleontology. Introduction to the study of fossils. A living example of each of the groups of animals with important fossil representatives is used as an introduction to the fossil forms of that group. Methods of preparation and study are developed from work upon material collected by the student himself. Prerequisite: Geol. 2 and Zool. 3. (5W) Williams

107. Igneous Petrography. Identification and classification of the igneous rocks by study of thin-sections with the petrographic microscope. Prerequisite: Geol. 102. (5S)

108. Stratigraphy. Introduction to the processes by which the sedimentary rocks have been formed, and to their original structures, followed by a study of the stratigraphic systems and their identification by guide fossils. Field trips required. Prerequisite: Geol. 3 and Geol. 106. (SS) Williams

110. Structural Geology. Types and origin of rock structures, and their role in the formation of mineral veins, petroleum and natural gas fields, and the general architecture of the Earth. Prerequisite: Geol. 3 or equivalent. (5W)

112. Economic Geology Nonmetals. Geologic occurrence and distribution of petroleum, natural gas, coal, building materials, and other non-metallic resources. Prerequisite: Geol. 101 and 110. (SS)

113. Economic Geology Metals. Geologic occurrence and distribution of metalliferous deposits of the world. Prerequisite: Geol. 101 and 110. (5F)
114. Field Methods. Field practice in measurement of attitude and thickness of formations, field use of topographic maps, and note taking. Mapping by pacing and compass, and plane table. Prerequisites: Geol. 3, C. E. 81 and 82. (SS) Williams

115. Advanced Physical Geology. Phases of geology of particular interest to students of conservation in the Western States. Processes of erosion, action and development of streams, land forms, subsurface water, etc. Prerequisites: Geol. 3 and College Mathematics, Chemistry and Physics. (SF) Williams

16 or 116. Special Problems. Direction in the study of special problems in which a student has become interested, and upon which he desires to make written reports. From one to six credits, not to exceed two in any quarter. Time arranged. Williams

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 or equivalent. (2S) Williams

120 or 220. Thesis. Upper division or graduate thesis. A thesis on some field problem is required of majors and five credits are given for its completion. Registration for undergraduate thesis is limited to Fall or Spring quarter. It must be for five credits and thesis must be completed in one quarter. Registration for the graduate thesis may be for one, two or three quarters and nine to fifteen credits are given for its completion. (5W) Ricks

230. Graduate Seminar. Time arranged. (2-5 F, W or S) Williams

History

Joel E. Ricks, John Duncan Brite. Professors.

See pages and for courses which may satisfy group requirements.

Students majoring in History should complete the following cases: History 1, 2, 13, 14, 105, 106, 124, 126, 135, 171A, 175, 190. Students majoring should consult the head of the department for registration.

History majors intending to pursue graduate work should complete two years of French or German.

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

2. Modern European History. A survey of the early and recent periods of modern European history from the seventeenth century to the Second World War. (SS) Brite

4. World Civilizations. A survey of the civilizations of the world from earliest times to the sixteenth century. Attention is given the life, principal contributions, and significance of past civilizations. (5F, W or S) Ricks and Brite

8. Recent European History. From the Treaty of Versailles 1919 to the present time, emphasizing the problems following the last war and the underlying causes of World War II. (3F, W or S) Ricks and Brite

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. (SF) Ricks

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

21. Hispanic American History. A brief survey of the beginnings and colonial development of Spanish and Portuguese America is followed by a more detailed study of the revolutions, establishment of republics, culture and international relations of the Hispanic American nations, and includes the Monroe Doctrine and Pan-American proposals. (5W) Ricks
22. The Pacific Area and Asia. Emphasizes modern problems of the Pacific areas and Asia. Includes also a brief survey of the cultures and history of these peoples as well as a more intensive study of their movements and aspirations. The background and nature of the Second World War in the Pacific and Asia is included. (2S)

34. English History. A survey of English history from the earliest times to the present day. (5F)

105. Greek History. The civilization of the Hellenic peoples from their beginnings in the days of Aegean civilization to the spread of Greek culture throughout the Mediterranean world by Alexander the Great. (4S)

106. Roman History. From the beginnings of the Roman Republic to the decline and fall of the Empire in the fifth century A. D. (3)

124. European History. The Renaissance, the Protestant Revolution and the Catholic Reformation from the thirteenth to the seventeenth century. (5F)

126. European History. The French Revolution and Napoleon, 1789-1815. (3W)

135 or 235. United States History. History of the Far West. This course will deal with the region from the Rockies to the Pacific Coast with special emphasis upon the Intermountain West. (5S)

171A. United States History. Constitutional History of the United States to present. (3W)

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

190 or 290. Historical Research. (2W)

Landscape Architecture and Planning

Administered jointly by the School of Agriculture and the School of Arts and Sciences

Laval S. Morris, Professor; Kenji Shiozawa, Assistant.

3. Elements of Landscape Architecture and Planning.
20. Drawing.
30. History and Literature of Landscape Architecture.
35. Theory of Design.
40, 41. Plant Materials.
60, 61, 62. Architectural Design.
130. Recreational Planning.
140, 141, 142. Design.
150, 151, 152. Planting Design.
160, 161, 162. Landscape Construction.
170. Civic Planning.
180, 181, 182. Advanced Planning and Design.
190. Special Problems.
195. Seminar.

See Landscape Architecture in School of Agriculture for course descriptions.

Mathematics

V. H. Tingey, Professor; Ralph L. Calvert, Neville C. Hunsaker, Associate Professors; Mary Nelson, Joe Elieh, Assistant Professors.

See pages 43 and 44 for courses which may satisfy group requirements.

Two types of majors are offered in the Mathematics Department. Students intending to do graduate work 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, 152 and fifteen additional hours of upper division mathematics. Regular majors must have a reading knowledge of either French or German. Physics 20, 21, 22 and nine additional hours of upper division physics are required. Fifteen hours of chemistry are required.

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. French or German is not required for those expecting to teach.

All students majoring in mathematics must have had plane and solid geometry. Plane Geometry is a prerequisite for all college mathematics.

33. Solid Geometry. (2F or W) Prerequisite: two yrs. 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 (5F, W or S)

46. Plane and Spherical Trigonometry. Prerequisite: 35 (5F, W or S)

50. Descriptive Astronomy. (3S)

60. Mathematics of Finance and Life Insurance. Prerequisite: 35. (3W)

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)

100. Calculus. Prerequisite: 99. (3S)

118. Modern Algebra. Prerequisite: 99. (3W)

119. Theory of Equations. Prerequisite: 99. (3W)

120. Modern Geometry. Prerequisite: 97. (3W)

121. Projective Geometry. Prerequisite: 99. (3S)

122. Ordinary Differential Equations. Prerequisite: 99. (3F or S)

123. Number Theory. Prerequisite: 99. (3S)

130. Advanced Calculus. Prerequisite: 100 (3F)

131. Advanced Calculus. Prerequisite: 130. (3W)

150. The Teaching of Mathematics in the Elementary and High School. (3F, W or S)

152. Partial Differential Equations. Prerequisite: 131. (3S)

153. Mathematical Readings. Prerequisite: 123. (3S)

254. Theory of Functions. Prerequisite: 131. (3F)

255. Theory of Functions. Prerequisite: 254. (3W)

256. Theory of Functions. Prerequisite: 255. (3S)

**DIVISION OF STATISTICS**

Degree: Bachelor of Science in Mathematical Statistics.

The work in Mathematical Statistics has a three-fold purpose:

(a) Training of professional statisticians.

(b) Instruction of students who wish to broaden their mathematical studies or who seek a mathematical background for work 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 courses 160 to 167 inclusive in the Division of Statistics and Mathematics 122, 130, 131 and 152.

160. Determinant and Matrix Theory. (3F)
161. The Calculus of Probability. (5W)
162 Mathematics of Statistics. (5F)
163. Mathematics of Statistics. (5W)
164. Modern versus Classical Statistical Theory. (3W)
165. The Theory of Errors and Least Squares. (3F)
166. Sequential Analysis and the Control of Quality of Output in Manufacturing. (3W)
167. Statistical Readings and Reports. (3S)

Military Science and Tactics

ARMY AND AIR FORCE


For students who wish to qualify for a Regular Army or Air Force commission, a department major in Military Science and Tactics is offered through the School of Arts and Sciences. In the post-war period the colleges and universities of the nation will be called upon to supply the majority of the officer personnel needed for the Regular Army, Marine Corps, and Air Force.

Students majoring in Military Science and Tactics must complete the following requirements: M. S. and T., 36 credits; Mathematics 34, 35, 46, 97, min. 30 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits History 17 and 21, 10 credits.

REGULAR ARMY AND AIR FORCE COMMISSIONS

Under authority granted in AR 605-7, the PMS&T is authorized to appoint as “Distinguished Military Graduates” such graduating students as are deemed worthy of commendation by both the President of the College and the PMS&T.

Under the provisions of Army Regulation 605-7, students designated as “Distinguished Military Graduates” are authorized to apply for direct commissions in the Regular Army and Air Force of the United States. Approximately ten such commissions will be available to students of this College each year.

Under the provisions of War Department Circular 20, 1947, students who receive reserve commissions are authorized to apply for a “Competitive Tour” of active duty to last for a period of two years. From each group of reserve officers who enter on these “Competitive Tours” a certain number are given commissions in the Regular Army and Air Force of the United States. It is estimated that approximately fifteen hundred such commissions will be awarded annually, throughout the nation.
Two years of military training (six credits) are required of all qualified male students at the College. Students are normally required to complete the basic course during the first and second years at the Institution.

See Military Science and Tactics Department, separate section, for course descriptions and other details.

Modern Languages and Latin

George A. Meyer, Professor; George C. Jensen, Professor Emeritus; Thelma Fogelberg, Marion L. Nielsen, Associate Professors; Aldyth Thain, Assistant Professor; Jesse G. Nelson, Gordon E. Porter, Miquette R. Nelson, Instructors.

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 space of time than required for the standard elementary courses. One hour daily is used for lecture and one hour for drill in oral-aural training. The equivalent of the standard first year of modern language is completed in two quarters. Special courses for advanced work are provided for those who have satisfactorily completed the intensive two quarters course.

Standard 5 credit elementary courses are provided for those whose aim is primarily a reading and some speaking knowledge of a foreign language and the 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 numbered above 110.

German: Forty-five credits including 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

FRENCH

1A. 2A. Elementary French. Intensive Course. Two hours daily. (7F, 7W) Meyer

1, 2, 3. Elementary French. (5F, 5W, 5S) Staff


102A. Intermediate French. (5F) Staff

101. Intermediate French. (5F) Meyer

102. Intermediate French. (5W) Thain

105. Advanced Composition and Conversation. (3W) Fogelberg

106. 107, 108. Selective Readings. Open to students who have completed French 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F, 1-2W, 1-2S) Staff

109. French Short Story. A study of the French Conte as a literary form from the earliest times. The course serves as an introduction to literary movements in France. Special emphasis on the 19th century. (3S) Meyer

110. French Phonetics. Principles of French pronunciation and their practical application. (3F) Thain

112. 19th Century French Poetry. (3W) Meyer

120. The Comedies of Molière. Molière’s plays as social criticism. (3F) Meyer

121. French Classic Drama. Plays of Corneille and Racine. (3W) Staff

122. Nineteenth Century French Drama. The Romantic and Realistic Schools. (3S) Thain

125. Survey of French Literature. (3S) Meyer

129, 130. French Literature of the 18th Century. Special emphasis on the philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. (3F, 3W) Meyer

131. The Comedies of Beaumarchais and Marivaux. (3S) Staff

GERMAN

1A, 2A. Elementary German. Intensive Course. Two hours daily. (7F 7W) Jensen

1, 2, 3. Elementary German. (5F, 5W, 5S) Staff
101A. Intermediate German. Intensive. (5S) Staff
102A. Intermediate German. (5F) Staff
101. Intermediate German. (5F) Staff
102. Intermediate German. (5W) Nielsen
105. Advanced Composition and Conversation. (3W) Staff
106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F, 1-2W, 1-2S) Staff
110. 111, 112. Scientific German. Reading of scientific texts. Reports. (2F, 2W, 2S) Open to students after completion of 101 or equivalent. Nelson
120. Die deutsche Novelle im 19. Jahrhundert. Reading and discussion of representative stories by Hauff, Storm, Heyse, Meyer, Keller and others. (3F) Staff
121. Lessing—Plays and Biography. (3) Staff
122. Schiller—Poetry, Plays and Biography. (3S) Staff
123. Die deutsche Novelle im 20. Jahrhundert. Representative stories by Thomas Mann, Heinrich Mann, Herman Hesse, Schnitzler and others. (3) Staff
125. Survey of German Literature. (3S) Staff
130. Goethe’s Faust. Prerequisite: Two years of college German or equivalent. (3W) Staff
131. Goethe’s Prose. Werther, Dichtung and Wahrheit, and selections from Wilhelm Meister. Reading of a Biography of Goethe. (3S) Staff
132. Heine’s Poetry and Prose. (3F) Staff
133. German Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) Staff
150. Schnitzler’s Stories and Plays. (3) Staff
151. Hauptmann’s Plays and Novels. (3) Staff
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) Nielsen

SPANISH

1A, 2A. Elementary Spanish. Intensive Course. Two hours daily (7F 7W) Fogelberg

1, 2, 3. Elementary Spanish. (5F, 5W, 5S) Staff
101A. Intermediate Spanish Intensive Course. (5S) Fogelberg
102A. Intermediate Spanish. (5F) Fogelberg
101. Intermediate Spanish. (5) Fogelberg
102. Intermediate Spanish. (5) Fogelberg
105. Advanced Composition and Conversation. (3W) Fogelberg
106, 107, 108. Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F, 1-2W, 1-2S) Staff
125. Survey of Spanish Literature. (3S) Staff

PORTUGUESE

1, 2, 3. Elementary Portuguese. Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5F, 5W, 5S) Meyer
LATIN

1. 2. 3. First Year Latin. Special emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of our own tongue. Especially recommended for English majors and for pre-law and pre-medical students. The course includes readings from Caesar. (5F. SW. SS)

101, 102, 103. Virgil and Cicero. Selected readings from the orations of Cicero and Virgil's Aeneid. Miscellaneous readings from other Roman authors. Open to all 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)

SPECIAL SERVICE COURSES


22. Italian Pronunciation. Same as for course 21. (2F) Jensen

23. German Pronunciation. Same as for course 21. (2S) Jensen

80. Medical Latin. (3F) Nielsen

81. Medical Greek. (3W) Nielsen

Physics

Willard Gardner, Professor Emeritus; Rolland Perry, Professor; Philip J. Hart, Associate Professor; Jay O. Jensen, Assistant Professor.

See pages 43 and 44 for courses which may satisfy group requirements.

Requirements of Physics Majors: 45 credits, of which 10 credits must be upper division courses, (numbers above 100). Certain approved courses in upper division Engineering and Radio Technology, not to exceed 10 credits may be counted.

Suggested courses: The course taken will depend on whether the student wishes to continue with graduate work in Physics or whether he desires to teach in high school. The following sequence of courses is recommended particularly for those who wish to continue in graduate study. Students desiring to complete a teaching major in Physics in preparation for secondary school teaching, or those desiring to take courses in physics 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 on page 51.

Freshman Year: Math. 35, 46, 97; Chem. 3, 4, 5; Bacteriology 1; Economics 51; 5 credits Social Science.

Sophomore Year: Physics 20, 21, 22; Math. 98, 99, 100; English 10; German 1, 2, 101.

Junior Year: Physics 120, 121, 130, or Physics 175, 176, 177; Math. 122, 119, 120; English 110; 5 credits Biological Science; German or French.

Senior Year: Physics 145, 153, 154; one other year course in Physics; Math. 130, 131; Chem. 104, 105, 106; Physics 108, 193, 194, 195. Language group electives.

A Teaching Minor in Physics is approved only for students majoring in closely related fields. Such students must complete Physics 20, 21, 22, and at least 3 hours of upper division work.

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 mathematics, and courses at the upper division level 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, Soil Physics. In cases where the candidate has less than six credits in one or more of the five fields he may be requested to take additional work in these areas as part of the work for the Master's Degree.

1. Household Physics. Designed primarily for Home Economics Majors. Covers selected topics in Physics of practical importance in the household, with heat and electricity receiving greatest emphasis. Four lectures, one lab. (5F, W or S)

Jensen

3. Introductory Physics. A non-technical course designed for students who do not expect to major in sciences but who want a knowledge and understanding of the fundamental physical principles and their applications. (5F, W or S)

Jensen

6, 7 General Physics. Physics 6 covers mechanics, constitution of matter, heat, and a 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 fundamental physical laws governing the atmosphere and its phenomena. A brief study of the polar-front theory, air-mass analysis, weather map reading, and forecasting. This course covers information required by the Civil Aeronautics Administration for flying. (3F)

Jensen

20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Light and Sound. For Science majors, Engineers, and students preparing for Medicine. Recommended for majors in Agriculture who intend to do graduate work. Prerequisite: Math. 44 or 46. Students should take this in the sophomore year. Three lectures, two labs and two quiz sections per week. (5; each class taught F, W or S)

Perry, Hart


UPPER DIVISION

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken as early as possible.

Physical Chemistry. See Chemistry 104, 105, 106 and Chemistry 109, 110, 111.

108. Advanced Laboratory Work. Recommended for students majoring in Physics. Can be taken only by special arrangement. (F, W or S) Time and credit arranged. Staff

114. Soil Physics. The fundamental laws of Physics are reviewed, with emphasis on mechanics and thermodynamics and their relation to soil problems. Some time is devoted to significant features of modern physics with particular reference to the theory of surface forces as they influence the behavior of soil colloids. Special attention is given the dynamics of soil moisture. A knowledge of elementary physics and mathematics is essential as well as a good foundation in soils. (3W)

117. General Meteorology. (Physics of the Air.) Atmospheric physics and weather phenomena from both the dynamic and synoptic procedures. A brief study of meteorological apparatus, observations, map reading, forecasting and including all the basic principles of aeronautical meteorology. Prerequisite: Physics 6 or 22 and Calculus. Four lectures, one lab. (5W)

Jensen

120. 121. Modern Physics. (Recommended for Juniors.) A study of electrons, ions, atomic structure and radiation. (3F. 3W)

Hart

130. Nuclear Physics. (To follow Physics 121.) A survey of methods and results of recent investigations of nuclear processes. (3S)

Perry

145. 146. Vector and Tensor Analysis. An introduction to vector and Tensor analysis and their applications. (3F. 3W)

t.b.a.

153, 154. Analytical Mechanics. (To follow Physics 145.) (3W. 3S)

t.b.a.

161. Thermodynamics. A short introduction to thermodynamics. (3S) Perry
166, 167. Geometrical and Physical Optics. (3W, 3S) Hart
175, 176, 177. Electricity and Magnetism. Electrostatics, Magnetostatics, D.C. and A.C. circuits, Electromagnetism, and Electromagnetic Theory. (3F, 3W, 3S) Perry

82. Electronics. The concept of the electron, its relation to the structure of the atom, to the conduction of electricity, to ionization, to photoelectric and thermoelectric effects, etc. Emphasis is placed on the 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)

193, 194, 195. Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in Physics. Students may register and receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for the course or not. (1F, 1W, 1S)

193, 194, 195. (283, 284, 285). Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in Physics. Students may register and receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for the course or not. (1F, 1W, 1S)

G R A D U A T E  C O U R S E S

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

290, 291, 292. Theoretical Physics. (3 each quarter F, W, S) t.b.a.
293, 294, 295. Seminar in Physics. (1F, 1W, 1S) Staff
250. Research in Physics. Credit to be arranged before registration. (F, W, S) t.b.a.

Upon sufficient demand, courses numbered 120-180 will be extended to cover more advanced work. Numbers will follow in consecutive order. Graduate credit may be given for certain upper division courses taken by graduate students upon completion of extra work. In such cases the number will be the corresponding “200” number.

Speech and Drama

Chester J. Myers, Professor; Rex E. Robinson, Floyd T. Morgan, Associate Professors; E. Leroi Jones*, Harold I. Hansen, Burrell F. Hansen, Assistant Professors; Stuart Hardman, Gwendella Thornley, Willis M. Rosenhal, Merlin J. Mecham, Instructors.

Forty-five credits of Speech are to be completed for the major. For prospective teachers, the distribution of these credits is to be as follows: courses in Public Speaking, 10 credits (Speech 125 required of all majors); courses in Interpretation, 10 credits (Speech 124 required of all majors); courses in Correction, 5 credits; courses in Dramatic Literature, 5 credits; courses in Play Production, 9 credits; elective courses in Speech, 6 credits. Students who do not intend to teach may apply for permission to substitute courses in their special fields of interest for some of those in this outline. A special major for students whose main interest is Speech Correction may be outlined by consultation with the Head of the Speech Department.

All Speech Minors must complete at least 18 credits of Speech work. Courses to be taken will be determined in consultation with the Head of the Speech Department.

Speech 123 is recommended for those who are planning to teach Speech.

*On leave 1949-'50.
Composite English—Speech Major. Students whose major interests are divided among English, Journalism and Speech may take a composite English-Speech major. Such a major relieves the student of the requirement for a minor. This combination is recommended highly. Consult with the Head of the English Department and the Speech Department. English-Speech majors should take English 1, 53; Journalism 12 (three credits) and 112; Speech 150 (six credits); 10 credits of Speech Corrective Work 10 credits of Interpretation, including 124; 10 credits of Public Speaking, including either 25 or 109 and Speech 123.

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 science, interpretation, theatre, and public address.

The following courses may be modified and used for graduate credit by students majoring in the Speech Department or by students in other departments: 107, 109, 110, 111, 123, 124, 125, 145, 150, 154, 171, 173, 181, 182, 184, 185.

1. Public Speaking. (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

4. Principles of Reading. The principles of effective oral and silent reading. Emphasis on oral delivery of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes not only standard literature, but also everyday reading matter. (5F, W or S) Thornley, B. Hansen

5. Extempore Speech. Designed to meet the 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 will not be given to students who have taken Speech 1. (5F, W or S) Staff

7. Basic Principles of Voice and Phonetics. A training course, adapted to individual needs and abilities. Exercises for flexibility of voice articulation, and pronunciation. Recommended for all Speech majors and minors, for prospective teachers, and others whose individual needs cannot be met successfully in Speech 1 or other courses in public speaking and oral interpretation. Jones

8. Speech Foundations. Required of all Speech majors in their sophomore year. This course is designed for students desiring information regarding all phases of speech and drama, and what prospects the fields hold for possible majors and minors. The Speech Staff appears before the class for lecture and discussions. This is not a performance course, but rather a survey. Areas in the speech field to be discussed include acting, directing, and technical work of the theatre, speech correction, oral reading and interpretation, public speaking and forensics and radio. (3S) H. Hansen and Staff

9 or 109. Public Discussion. Application of various group discussion techniques to current problems. Efforts are made to have some of the discussions presented to various civic and religious organizations, or to release them over a commercial radio station. (3S) Robinson

11. Speech for the Foreign Student. The class is designed to help foreign students with conversational and technical vocabulary development. (3 F. W. or S.)

12 or 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 anyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged. Staff

13 or 113. Argumentation. For the student desiring a background of information and practice in the techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumenta-
tive speech. Students present argumentative speeches, including class debates. Required of those wishing credit for Speech 15 or 115, Intercollegiate Debating. (3F)

Robinson

15 or 115. Intercollegiate Debating. Members of the debating squads may receive not more than three credits in any one year. Credit is granted only to those with credit in Speech 13 or 113, Argumentation. (3F, W or S)

Robinson

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. (3S)

Myers

18 or 118 Story-telling. The story as an educational factor, analysis and classification of typical stories with reference to each period of the child's development. Study of sources; adaptation of material; and actual practice in story-telling. Consideration is given stories of western pioneer life. The work is designed to meet the needs of student, teacher, recreation leader, church activity leader, librarian, and parent. (5F, W, or S)

Myers

20 or 120. Playground Dramatics and Pageantry. For those interested in studying principles involved in playground dramas, make-up, pageantry, story-telling, and related activities. (3W)

Myers


Prerequisite: Speech 1 or 5. (3F, W or S)

Robinson

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)

Robinson

Myers

26 or 126. Make-up. Straight and character make-up. For Speech and Music majors and minors, MIA workers and prospective teachers. Theory and practice in the art of make-up. (1F)

H. Hansen

28 or 128. Make-Up. Nationals: Negro, Oriental, and special problems in make-up. It is suggested that students complete 26 or 126 before taking this course. (1S)

H. Hansen

44. Fundamentals of Acting. Problems of terminology, interpretation of role, and body movement. (3F)

H. Hansen

English 47, and 48. (See English Department)

60. Drama Appreciation. An introduction to the understanding and enjoyment of dramatic literature, radio drama, and moving pictures. Selected readings of dramatic masterpieces and other contributions to the theatre. (5W)

H. Hansen

English 63, 163 (See English Department)

67 or 167. Introduction to Speech Correction. Required of all Speech and Speech Correction majors and those taking a composite Speech and English major. It is suggested as an elective for majors in Psychology. This is the first course in speech correction, dealing with common speech defects and remedial measures for problems in lisping, indistinct pronunciation, foreign accent, delayed speech, stuttering, and inappropriate use of the voice. Not open to graduate students. (5W)

H. Hansen

73 or 173. Speech Clinic. Application and discussion of methods applied to speech correction in the clinic. Training and practice through the supervised handling of selected cases. Students who have had one quarter of experience are allowed to participate in extension clinics. Prerequisite or corequisite: Speech 167. Consult the instructor for permission to register. Not open to graduate students. Any quarter. Credit arranged.

Mecham

75. Remedial Speech. This course is intended for those who have a noticeable difficulty with speech, in articulation, quality, pitch, intensity, or rhythm. Time arranged. (2F, W or S)

Mecham

81. Introduction to Radio. Survey of radio station and network operations, organization, and programming. Attention is given to developing an understanding of radio as a factor in our social organization, and to developing an appreciation in selection of programs. (3F)

B. Hansen

82. Radio Speech. Analysis and development of the speech skills and speech forms as applied to radio. Development of acceptable standards of voice and
articulation for radio presentation is emphasized. Effective organization and presentation of the various speech types utilized on the air—announcements, talks, interviews, round-tables—are included. (3W)  

B. Hansen

83. Elements of Broadcasting. A study of the various aspects of broadcast programs with practice in each. Writing and presentation of commercial continuity, news, musical programs, drama, and special events, is carried out. (3S)  

B. Hansen

84. Control Room and Studio Operations. Study of basic studio and control room equipment with regard to function, placement, operation and care. 1 hour lecture and 2 hours of lab. per week. Registration only by instructor's permission. (2F)  

B. Hansen

106. The Current and Recent Broadway Theatre. Discussion, lecture, and reading of the more recent plays that have been presented on Broadway. An analysis of the play, cast, and staging, including professional critical reviews. (2F)  

H. Hansen

107. Speech Hygiene. Techniques of normal speech and development of normal and abnormal speech. Major consideration given prevention and correction of speech abnormalities. Primarily designed to satisfy speech hygiene needs of elementary school teachers. Recommended for all secondary teachers but does not fulfill the speech pathology requirement for Speech majors. (3F)  

Mecham

108. Interpretation: Scene and Play Reading. Instruction for readers of plays. The classics as well as modern plays are to be used. (3W)  

Myers

110. Public Programs. Types of interpretive material suitable for presentation before various kinds of audiences. Reading of short stories, plays, and novels to determine suitability. The cutting of various types of material to suitable form and length for public reading. (2S)  

Myers

111. The Psychology of Speech. The principles of psychology which underlie speech. Problems considered include the nature and origin of speech, language in the child and the psychology of the audience. (3S)  

Jones

114. Writing for Radio. (3S) (See Journalism Division)

213. Teaching of Speech. (Education 123) The methods and problems peculiar to the teaching of speech. A study of the organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2F)  

Myers

124. Advanced Interpretation. The mastering of significant selections from the great writers. The student grows in power to interpret permanent literature. Reading from manuscript and from memory. (5W)  

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

144. Advanced Acting. Problems of characterization, tempo, and more advanced body movement. Analysis of the role. (3W)  

H. Hansen

146. Stage Directing. The fundamental principles of directing plays, musical comedies, pageantry, opera, and the dance. Theory and practice. (3S)  

H. Hansen

150, 152, 154. Drama Production. Study and application of the materials and processes of play production. Scene design and construction, scene painting, lighting, costuming, management, advertising, etc., are studied and principles learned applied to production of plays. Students are assigned to work on staffs and crews of Utah State Theatre and Workshop productions. Speech majors and minors must register for the fall quarter section (150) and for either the winter (152) or spring (154) section. (3F, 2W or S)  

Morgan

158. The One Act Play. Study and analysis of selected one act plays. A course recommended for students who will become community, school, or church drama directors. (2S)  

Morgan

159. Children's Theatre. Creative dramatics for children. Educational dramatics for students who wish to prepare to direct children in dramatic work. A study is made of plays suitable for primary and intermediate schools. Courses in dramatics are outlined, stories dramatized, and plays produced. The College
Training School affords opportunity for this work. Of special interest to prospective elementary school teachers. Consult instructor before registering. (3-5W) Myers

160. Dramatic Structure. Study and analysis of dramatic structure and technique. For students interested in direction, dramatic literature and playwriting. (3S) Morgan

162. Masterpieces of Drama and the Theatre. A study of selected dramas of all periods. Plays will beanalyzed and discussed from the point of view of the actor, director, and producer. (2F) Morgan

164. Masterpieces of Drama and the Theatre. A continuation of Speech 162. (2W) Morgan

170. Drama Analysis and Theories of the Stage. For a clearer understanding of the theatre’s place as an institution, and its responsibilities. A lecture and discussion course relating theatre to other arts, in a modern world; the relationship of the actor, director, painter, and author to the audience. H. Hansen

171. Speech Pathology. Advanced course in speech correction. Speech involvements of pathologies of the larynx, mouth, ears, and brain. Disorders such as pathological voice defects, cleft palate, difficulties in hearing and deafness, aphasia, and spastic speech receive particular attention. Prerequisite: Speech 167. Jones

Speech 181. Radio Production. Study and studio practice in the problems in directing and producing various kinds of broadcasts. Planning of programs, casting and rehearsal procedures, coordination of the technical aspects of production, and problems in special studio effects are considered. Registration is limited to Juniors and Seniors. (3S) B. Hansen

181. Radio Production. Planning and presentation of various types of radio programs—dramatic, musical, talks, news, feature, audience participation, variety, and special events. Registration limited to Juniors and Seniors. (3S) B. Hansen

182. Radio Newscasting and Writing. Offered for credit 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. (5S) Andersen, B. Hansen

183. Radio Programming for the Rural Audience. A course designed for people whose interests or vocations are concerned with rural life. Particularly recommended for County Agents, 4-H workers, Home Demonstration Agents, Extension workers, and Conservation workers. Analysis and discussions of farm and home needs which radio can serve. Design, writing and production of various types of programs of interest and value to farm listeners. (3W) B. Hansen

184. Radio Programming for Children. Objectives and principles of radio programs for children are studied. Various types of programs for children of different ages will be developed, written and produced. B. Hansen

185. Advanced Radio Production. This course follows 181 and will deal with more specialized production problems such as remote pick-ups, integration of recorded with live material, network and local studio coordination, documentary productions, dramatic problems and special events. Prerequisite 181. B. Hansen

190. Problems in Speech and Theatre. 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 the instructor for permission to register. Any quarter. Credit arranged. Staff

GRADUATE COURSES


201. Thesis. Prerequisite: Graduate standing. (2-5 F, W or S) Myers and Staff

202. Seminar in Theatre. Prerequisite: Graduate standing. (2F, W or S) Morgan, Hansen and Staff
203. Seminar in Public Speaking. Prerequisite: Graduate standing. (2F, W or S) Robinson and Staff

204. Seminar in Interpretation. Prerequisite: Graduate standing. (2F, W or S) Myers and Staff

205. Seminar in Speech Science. Prerequisite: Graduate standing. (2F, W or S) Jones and Staff

207. Experimental Phonetics. Prerequisite: Graduate standing. The course aims, first, to present principles involved in the scientific analysis of speech and voice; second, to describe the major laboratory instruments and techniques in current use; third, as far as possible, familiarize the student with actual laboratory practice. Jones

208. Experimental Phonetics. A continuation of Speech 207. Jones

209. Voice and Articulation Disorders. Prerequisite: Graduate standing. Theory and practice of voice and articulation retraining. Practice in examination, diagnosis, and treatment, attention to the problems of both children and adults. Review of studies relevant to the field. Jones

Zoology

ZOOOLOGY, ENTOMOLOGY, PHYSIOLOGY, AND NURSING

Administered jointly by the School of Agriculture and the School of Arts and Sciences


For a major in Zoology the following courses must be taken: Zoology 3, 4, 112, 116 or Entomology 115, 117 or 127, 118 or 119; 124, 126, 131; Entomology 13 and Physiology 121, 122. Students especially interested in the natural history phases of Zoology may make the following substitution for a major in Zoology: 121 or 122 for Physiology 122. Also the following courses are recommended: Mathematics 34, 35, 44, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 20, 21, 22; Botany 24, 25; Bacteriology 1 or 70, 71; Geology 1, 2. For students planning to do post graduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction to the School of Arts and Sciences must be completed, and in addition the following courses must be taken: Zoology 107, 112, 116, 117 or 127, 124, 126, 131; Entomology 115.

Master of Science Degree

The Zoology, Entomology, Physiology, and Nursing Department offers work leading toward the Master of Science degree in various phases of agricultural entomology, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

The following courses are acceptable for graduate credit for Master of Science Degree candidates in the Department: Zoology 107, 116, 118, 119, 131; Entomology 103, 104, 109, 156; Physiology 121, 122, 123, 160, 180.

The following courses may be used for graduate credit by students majoring in other departments: Zoology 107, 112, 116, 117, 118, 121; Entomology 101, 103, 104, 108, 109, 113, 138, 159; Physiology 121, 122, 123, 160.

ZOOGOGY

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 environment,
kinds of living things, reproduction, development, inheritance, and evolution. For lower division students, except those who elect Botany 24, 25, or Zoology 2 or 3 and 4. (SF, W or S)

2. General Zoology. A brief survey of the more important groups of animals, including the organization, behavior, reproduction, classification and relationships of each group. The basic principles of greatest importance in Zoology receive consideration. 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. (SF or S)

3. Invertebrate Zoology. An introduction to the invertebrate animals. Classification and relationships, structural characters, function and development are emphasized. Some attention is also given to parasitism. This course is well adapted for premedical and predental students. Forestry (Wildlife) majors, and others who desire a comprehensive introduction to the animal kingdom. Three lectures, two labs. (SF or W)

4. Vertebrate Zoology. The vertebrates, with emphasis on structure, function, evolutionary relationships and some consideration of natural history. (SW or S)

106. Zoological Literature. The literature and bibliographies of zoology and entomology. Each student is assigned, or may choose, a report on the literature of some insect or other animal. Prerequisite: two or more of the fundamental courses required of department majors. (1S)

107. History of Biology. The more important men and ideas in the historical development of biology with especial reference to the zoological sciences. (2F)

111. Heredity. The facts and principles of inheritance, with emphasis on application to human beings. This includes a consideration of how characteristics are passed from parent to offspring, how the most important human characteristics are inherited, and how the human race as a whole is being influenced in its inherited qualities by various agencies and conditions. It is desirable but not essential that an introductory course in biology, physiology, or botany precede this course. (4F or S)

112. Principles of Genetics. A technical course in the basic principles underlying heredity and variation, and their application to the problems of plant and animal breeding, and human inheritance. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (SF or W)

116. Parasitology. The protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Some consideration is given free-living relatives of parasites. Forms occurring in this general region are emphasized. Prerequisite: Zool. 3. Three lectures, two labs. (SS)

117. Methods and Elements of Animal Histology. An introduction to the techniques employed in making preparations of animal tissues for microscopic study, and a consideration of the structural characteristics of the tissues and principal organs in representatives of the groups of animals, especially vertebrates. Two lectures, two labs. (4F)

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates, including the formation of gametes, fertilization, cleavage, gastrulation, formation of germ layers, establishment of body form, and organogenesis. In the laboratory the development of the frog, chick and pig is studied. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (SW)

119. Comparative Anatomy. The fundamentals of structure of the vertebrate body. The anatomy of typical representatives of each class of vertebrates and the organs systems from the simplest to the most complex forms are studied on a comparative basis. In the laboratory, the shark and the cat are thoroughly dissected. Prerequisite: Zool. 4 or equivalent. Two lectures, two labs. (4S)

121. Ornithology. Bird study planned to acquaint the 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)
122. **Mammalogy.** Designed to introduce the students to the large and very important class, 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.** The identification, natural history of habits, food, distribution and other features of the more common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Major consideration given to insects, birds, and mammals. A considerable amount of laboratory time is spent in making observations in the field, and some longer field trips are taken. Prerequisite: Zoology 1 or 3 and 4. Two lectures, two labs. (4W) **Stanford**

124. **126. Seminar.** Students and department faculty meet for one hour each week and hear reports from the members of the seminar on topics of mutual interest. Students majoring in the department must attend and participate in the activities of the seminar for at least two quarters. (1F, 1S) **Staff**

127. **Cytology.** An introduction to the study of cells, with emphasis on chromosomes and their behavior in the development of germ cells. (4W) **Staff**

131 or 231. **Organic Evolution.** A critical study of the facts of evolution as obtained from a 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 111 or 112 recommended. (3W) **Staff**

155. **Ichthyology.** Ecology, classification, and life histories of native and introduced fishes. Two lectures, one lab. (3W) **Sigler**

160. **Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. Additional assignment to graduate students. (3S) **Kelker**

199. **Minor Problems.** Deals with research problems similar to Zoology 201, but intended primarily for undergraduate majors in Zoology. Credit arranged. (F, W or S) **Staff**

201. **Special Problems.** The student who wishes to engage in some line of original research and is qualified to do so may elect and study some topic in Zoology. Open to undergraduates only by special arrangement with the department. Credit arranged. (F, W or S) **Staff**

205. **Methods of Research.** For students doing or intending to do original work in some line of Zoology or Entomology, this course offers instruction in selection of topics for research, organization of attack upon problems, methods of finding previously published work, outlining the problem, illustration of the thesis, etc. Required of graduate students who are working for a Master's degree in the department. (1W) **Staff**

217. **Advanced Histological Technique.** A continuation of Zoology 117 for graduate students, and for students who wish a more thorough and extensive training in the techniques of preparation of biological materials for study. Additional techniques such as the celloidin method, freezing method, embalming and injection of specimens, etc., will be undertaken. Prerequisite: Zoology 117. (3S) **Staff**

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**

**ENTOMOLOGY**

For a major in Entomology the following are required: Zoology 3, 4, 106, 107, 111 or 112, 131; Entomology 13, 101, 102, 103, 109, 115, 120, 125, 126, 156. The following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 24, 25, 30, 130; Range 128; and one basic course in each of the following fields: Agronomy, Horticulture and Vegetable Crops. For students who are planning to do postgraduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.
For a major in Agricultural Entomology see Department of Zoology, Entomology and Physiology, in School of Agriculture.

13. General Entomology. The structure, classification, interrelationships, and life histories of insects are studied. Some field trips are taken. Three lectures, two labs. (5F) Stanford

101. Insect Morphology. Comparative study of insect anatomy with emphasis on structures used in taxonomy. Prerequisite: Ent. 13. Two lectures, two labs. (4W) Stanford

102. Systematic Entomology. Each student must collect, properly mount, and label a representative collection of insects containing at least 400 specimens, at least 125 species, and at least 15 orders. The whole collection must be arranged in phylogenetic sequence. Classification must include a correct placement of all specimens in orders. To be taken only with permission of instructor. Prerequisite: Ent. 13. Three labs a week. (3F, W or S) Knowlton

103 or 203. Systematic Entomology. Continuation of Ent. 102. The collection arranged for Ent. 102 must be enlarged to at least 700 specimens, 225 species, 100 families, and 19 orders. Classification will include a correct placing of specimens in families. To be taken only with permission of the instructor. Prerequisite: Ent. 101. Three labs. (3F, W or S) Knowlton

104 or 204. Systematic Entomology. Continuation of Ent. 103. Permission to take this course depends on the student's collection for Ent. 102 and 103. If his collection justifies further study, he may select one or two orders of insects and classify them to species. To be taken only with the permission of the instructor. Three labs (3F, W or S) Knowlton

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. (3F) Stanford

106. Zoological Literature. (See Zoology 106)

108. Agricultural Entomology. Insect pests of major economic importance to agriculture in Utah and the West, including their recognition, type of damage inflicted, distribution, life history, and methods of control. Some field trips for observation of insect pests, their activities and damage. Also demonstrations of mixing and application of insecticides. Primarily for upper division students. Three lectures, two labs. (5F or S) Scrsens

109 or 209. Advanced Economic Entomology. Recognition and control of important insect pests by chemical, physical, cultural, biological, mechanical, and quarantine methods. Prerequisite: Ent. 108. Three lectures, two labs. (5W) Knowlton

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 diseases receive major attention. Prerequisite: Ent. 13 or equivalent. Two lectures, two labs. (4W) Stanford

120. Insect Pollination in Relation to Agriculture. Primarily to give agricultural students an understanding of the role played by bees and other pollinating insects in the production of seed, fruit, and nut crops. The significance of beekeeping in the general agricultural economy is emphasized. The honey bee is studied as an insect which can be managed by man for pollination and for the direct production of many useful products. Problems in conservation, increase, and better utilization of pollinating insects are studied. Special attention is paid to pollination of commercial crops including fruits, nuts, and oils, and to pollination of seed crops, including legumes, vegetables, ornamentals, medicinals, and fibre plants. Use of insects for pollination in breeding experiments discussed. (2S) Todd and Boban

125, 126. Seminar. Students are assigned subjects upon which they report to the group. In the winter quarter entomological subjects are assigned; in the spring quarter subjects fundamental to both entomology and zoology. Chie for major students. (1W. 1S) Staff
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. (3S)

156 or 256. Chemistry of Insecticides and Fungicides. For course description see Chemistry 156 or 256. (2W)

160. Animal Ecology. (See Zoology 160)

199. Minor Problems in Entomology. Research problems similar to Ent. 210, but intended primarily for advanced undergraduate majors in Entomology. Credit arranged. (F, W or S) Staff

210. Special Problems. Students may select or be assigned problems dealing with certain phases of Entomology. The amount of credit depends on nature of problem and time spent. Open to undergraduate students only by special permission. Prerequisites: Ent. 123, 124, 125. Credit arranged. (F, W or S) Staff

230. Insects in Relation to Plant Diseases. Important insect vectors of plant disease, their habits, modes of transmission and dissemination of plant diseases. Rearing and handling methods, equipment and techniques. Prerequisite: Ent. 103 or 108. Three credits, or four credits with laboratory. (F) Sorensen

231. Biological Control of Insect Pests. Biological agents in insect control. Invertebrate parasites and predators, vertebrate predators, and diseases are considered as they relate to suppression or control of insect pests. (3W) Knowlton

233. Introduction to Aphidology. Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 102. (2W) Knowlton

234. Readings in Entomology. Assigned readings of advanced nature. Credit arranged. (F, W or S) Staff

250. Research and Thesis. For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Credit arranged. (F, W or S) Staff

PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 115 or 116 or 117, 121, 122, 123, 180, 195. Also Mathematics 34, 35 and 44; Physics 20, 21 and 22; Chemistry 3, 4, 5, 121, 122; Biochemistry 191; Zoology 1, 3 4, 117, 118, 119 and 13; 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 and who is not planning advanced intensive study in the field. It deals with the functioning of the human body with emphasis upon broad general biological principles. (5F, W or S) Staff

20. 21. Human Anatomy and Physiology. A two-quarter course dealing with structure and function of the human body. Physiology 20 is a prerequisite of Physiology 21. These courses are designed for the training of nurses and others requiring a more thorough study of anatomy and physiology than is given in Physiology 4. (4F, 4W) Staff

104. Kinesiology. Articulations and muscles with an analysis of movements and actions. The skeleton, manikin and man himself afford laboratory material. (3S) Staff


121, 122. Physiology. An intensive and detailed study of physiology. The function of each of the organ systems of man and animals is studied. Unless special permission is granted, students may not register for the second quarter without having had the first. As preparation, Physiol. 4, Zool. 2, 3, or 4, or Vet. Sci. 20, and a course in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) Biddulph

123. Endocrinology. The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiol. 4 or Zool. 1, 2, 3 or 4, or Vet. Sci. 20 are recommended. (3S) Biddulph
160. 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) Biddulph

195, 295. Physiology Seminar. (1S) Biddulph

260. 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

NURSING

Through a joint program offered by the Logan L.D.S. Hospital and the College, students may qualify for Registered Nurse credentials in three calendar years, or for both the R.N. and the Bachelor of Science degree in four calendar years. Part of the time is spent attending classes at the college, part of it attending classes and doing other work at the Logan Hospital, and part of it at Denver General Hospital.

Persons interested may obtain further information from the Division of Nursing at the College, or the Superintendent of Nursing Training, Logan L.D.S. Hospital.
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Pre-Legal Training .................................................... 132
Training for Government Service ................................. 132
Agricultural Economics and Marketing ....................... 133
Business Administration ........................................... 135
  Accounting ...................................................... 136
  Business Administration ....................................... 137
Business and Distributive Education ......................... 139
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General Information

The purpose of the School of Commerce is to give opportunity for a liberal education with special emphasis upon the commercial, social and political phases of life. Persons who complete the courses offered in this School are prepared to assume leadership and responsibility in business and in various industries and professions. In order to meet the growing demand and to keep pace with recent tendencies in education, students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Business Education, Economics, Political Science, Sociology, Agricultural Economics and Marketing.

For the professions of law and medicine some of these subjects such as Economics or Political Science afford excellent preparation. Graduates are prepared for positions as teachers in high school. Many desirable positions as industrial managers are open to those who are qualified by training and experience. Many students who are especially qualified find employment in the field of retail and wholesale merchandising.

Special attention is called to the many opportunities for service in sociological and governmental work. (See Training for Government Service.) The Departments of Political Science and Sociology offer basic and professional courses in these fields.

For requirements for admission, certification, and graduation see pages 43 to 51.

NOTE: All students in the School of Commerce are urged to take Textiles and Clothing 15 and Principles of Nutrition 5, School of Home Economics.

Pre-Legal Training

Students who plan to go into the profession of Law may pursue a course of study, primarily in the School of Commerce, that will not only enable 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 where it is not required for admission.

Prospective law students may major in any department in the School of Commerce, but not less than fifteen credits of work should be done in each of the following fields: Accounting, Economics, Political Science, Sociology, History and English, in addition to meeting the requirements for graduation in the Major Department.

All pre-legal students should consult Professor M. R. Merrill.

Training for Government Service

The Federal Government during recent years has employed increasing numbers of College-trained men and women who are qualified for service in its various departments. In all probability this expansion of government activity will continue for several years. In suggesting the following courses the School of Commerce has attempted to indicate lines of study which will be helpful in preparing for government service. With slight modification, these courses will serve equally well to qualify the student for desirable positions outside the field of government service, as the basic requirements in both fields are similar.

Suggested Courses

I. Accounting: Acc. 1, 2, 29, 101, 102, 103, 105, 111, 120, 121, 127; Pol. Sci. 129.
II. Land Economics: Econ. 28, Econ. 51, 52 or Agr. Econ. 53a, b; Agron. 56; Pol. Sci. 1, 10 and 129; Bus. Ad. 141; Agr. Engineering 108; Geology 3.

In addition the student should satisfy the requirements for a major in Agricultural Economics.
III. Marketing: Econ. 28, 51, 52 or Agri. Econ. 53a, b; Math. 30, 60, 111.

IV. Consular and Diplomatic Service: Pol. Sci. 10, 11, 12, 13, 101, 102, 104, 105, 106, 107, 129; German, French, Portuguese, or Spanish depending upon the location desired; English 10 or 11, 111; Econ. 51, 52, 140

V. General Administrative Training:

It is felt that anyone contemplating government service should have an intimate knowledge of the workings of our government and its relationship to industry. To supply that need the following courses are suggested: Pol. Science, 10a, 103, 129, 200; Econ. 125, 147.

VI. Statistics: Math. 30, 35, 60 and 111; Econ. 28, 51, 52, 131, 132.

VII. Secretarial Science: Sec. Sci. 30, 65, 80, 82, 89, 90, 91, 94, 98, 175, 183, 184, 186, 187; Bus. Ad. 1, 2, 25, 101, 135, 136; Econ. 51, 52, 140; Pol. Sci. 10, 129; Sociology 70.

VIII. Sociology:

For Case Work:

- Psych. 103a and 103b, 110.
- Child Development 60.
- Soc. 10, 52, 70, 110, 156, 160, 170, 172, 220.
- Soc. 52, 70, 102, 156, 160, 170, 172, 220.

For Social Research:

- Math. 34, 35 and 111
- Soc. 70, 202, 220.

Thirty credits of factual courses in the Department.

Field Work under supervision.

IX. Economics: Math. 30, 34, 60, 111; Econ. 27, 28, 51, 131; Soc. 70. And the courses listed for those majoring in Economics.

X. Agricultural Economics:

The student should satisfy the requirement for a major in this department.

In addition a thorough preparation should be made in the special fields in which it is desired to work such as wool, dairying, etc.

Agricultural Economics and Marketing

Administered jointly by the School of Agriculture and the School of Commerce


Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from that school, include basic agricultural courses prescribed by the major professor.

To meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule of this prescribed course may be obtained from the office of the Department of Agricultural Economics.

A Master of Science Degree—The Department offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in agricultural economics by the Department.
staff with the assistance of graduate students. The following courses may be used for graduate credit by students majoring in the Department: 101, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122. For graduate students in other departments the following courses may be used for graduate credit: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120.

A minimum of five credits in the principles of economics is a prerequisite for all courses in agricultural economics.

Required work for students majoring in marketing in the Department of Agricultural Economics in the School of Commerce

<table>
<thead>
<tr>
<th>Course</th>
<th>Dept.</th>
<th>Course No.</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Economics</strong></td>
<td></td>
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<tr>
<td>Principles of Economics</td>
<td>Ag. Econ.</td>
<td>53, 54</td>
<td>6</td>
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<tr>
<td>Economic Problems</td>
<td>Ag. Econ.</td>
<td>52</td>
<td>5</td>
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<tr>
<td>Intermediate Economic Theory</td>
<td>Ag. Econ.</td>
<td>107, 108</td>
<td>6</td>
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<tr>
<td>Money and Credit</td>
<td>Ag. Econ.</td>
<td>185</td>
<td>3</td>
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<tr>
<td>Economics of Consumption</td>
<td>Ag. Econ.</td>
<td>145</td>
<td>2</td>
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<tr>
<td>Risks and Risk Bearing</td>
<td>Ag. Econ.</td>
<td>139</td>
<td>3</td>
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<tr>
<td>Transportation</td>
<td>Ag. Econ.</td>
<td>135</td>
<td>3</td>
</tr>
<tr>
<td><strong>Marketing</strong></td>
<td>Ag. Econ.</td>
<td>62, 162, 163</td>
<td>11</td>
</tr>
<tr>
<td>Marketing Theory</td>
<td>Ag. Econ.</td>
<td>112, 113</td>
<td>5</td>
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<tr>
<td>Agricultural Prices</td>
<td>Ag. Econ.</td>
<td>120</td>
<td>3</td>
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<tr>
<td>Commodity Marketing Courses (Ag.)</td>
<td>Ag. Econ.</td>
<td>114, 115, 116</td>
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<tr>
<td>(Minimum of one course)</td>
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<tr>
<td>Problems of Merchandising</td>
<td>B.A.</td>
<td>151, 152</td>
<td>6</td>
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<tr>
<td>Principles of Advertising</td>
<td>B.A.</td>
<td>156</td>
<td>5</td>
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<tr>
<td><strong>Other Agr. Econ. Courses</strong></td>
<td>Arm. Econ.</td>
<td>240, 242</td>
<td>4</td>
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<tr>
<td>Research Methods</td>
<td>Ag. Econ.</td>
<td>104</td>
<td>3</td>
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<tr>
<td>Economic Development of Agriculture</td>
<td>Ag. Econ.</td>
<td>105</td>
<td>3</td>
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<tr>
<td>Agricultural Finance</td>
<td>Ag. Econ.</td>
<td>230, 231, 232</td>
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<tr>
<td>Seminar</td>
<td>Ag. Econ.</td>
<td>120 or 106</td>
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<tr>
<td>Farm Management or Land Economics</td>
<td>Ag. Econ.</td>
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<tr>
<td><strong>Math and Statistics</strong></td>
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<tr>
<td>Algebra</td>
<td>Math.</td>
<td>34, 35</td>
<td>8</td>
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<tr>
<td>Statistical Methods</td>
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<td>121, 122</td>
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<td><strong>Accounting</strong></td>
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<td>B.A.</td>
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<td>B.A.</td>
<td>101, 102</td>
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<td><strong>General Agriculture</strong></td>
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<tr>
<td>Courses in Agricultural Production</td>
<td>Ag. Depts.</td>
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<td><strong>Chemistry</strong></td>
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<tr>
<td>Chemistry</td>
<td>Chem.</td>
<td>10, 11, 12</td>
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<td><strong>Biological Group</strong></td>
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<tr>
<td>Bacteriology</td>
<td>Bact.</td>
<td>1, 2</td>
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<tr>
<td>Elective</td>
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<tr>
<td><strong>English</strong></td>
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<tr>
<td>Scientific Vocabulary</td>
<td>Eng.</td>
<td>5</td>
<td>3</td>
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<tr>
<td>English</td>
<td>Eng.</td>
<td>10, 110</td>
<td>9</td>
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<tr>
<td>Journalism</td>
<td>Journalism</td>
<td>12</td>
<td>3</td>
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<tr>
<td><strong>Language and Arts Group</strong></td>
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<tr>
<td>Elective</td>
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<tr>
<td><strong>Other Courses</strong></td>
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<tr>
<td>Elective</td>
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<td>17</td>
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</tbody>
</table>

See Agricultural Economics in School of Agriculture for course listings.
Business Administration
(Including Accounting and Merchandising)

V. D. Gardner, W. L. Wanlass, Professors; L. Mark Neuberger, Associate Professor; Ina Doty, Clara P. West, Norman S. Cannon, Charles G. Ellington, Assistant Professors

Students majoring in Business Administration and Accounting may concentrate in the fields of Accounting, Finance, Management, Merchandising, Secretarial Science and Business Education. Students are advised to select from the courses listed below to complete their major and technical subjects according to their field of concentration. (Students majoring in Secretarial Science should register under the advice of the Instructional Staff for Secretarial Science.)

CREDIT TOWARD MASTER OF SCIENCE DEGREE

With the approval of heads of related departments in which students are candidates for the Master of Science degree, Courses No. 101 or above in the Department of Business Administration and Secretarial Science are acceptable for graduate credit.

RECOMMENDED COURSES FOR MAJOR AND SPECIAL GROUPS IN BUSINESS ADMINISTRATION

**Freshman Year**

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<td>B.A.</td>
<td>1-2</td>
<td>Int. Accounting</td>
<td>10*</td>
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<td>63</td>
<td>Salesmanship</td>
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<td>Econ.</td>
<td>51</td>
<td>General Economics</td>
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<td>Econ.</td>
<td>27</td>
<td>Economic Dev. of U.S.</td>
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<td>Econ.</td>
<td>28</td>
<td>Economic Geography of World</td>
<td>3</td>
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<td>Psy.</td>
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<td>Psychology</td>
<td>5</td>
<td>5</td>
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<tr>
<td>B.A.</td>
<td>20</td>
<td>Problems of Small Business</td>
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<td>Soc.</td>
<td>70</td>
<td>Principles of Sociology</td>
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**Sophomore Year**

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<tr>
<td>B.A.</td>
<td>12</td>
<td>Soc. Security &amp; Payroll Accountg.</td>
<td>3</td>
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<tr>
<td>B.A.</td>
<td>25</td>
<td>Int. Business Administration</td>
<td>5*</td>
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<tr>
<td>B.A.</td>
<td>59</td>
<td>Blue Print Reading and Ind. Draw.</td>
<td>3*</td>
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<td>B.A.</td>
<td>62</td>
<td>Int. Marketing</td>
<td>5</td>
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<td>B.A.</td>
<td>28</td>
<td>Business Finance</td>
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<td>5*</td>
<td>5*</td>
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<td>B.A.</td>
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<td>Int. Personnel Administration</td>
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<td>Advanced General Economics</td>
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<td>34</td>
<td>Algebra</td>
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<td>Math.</td>
<td>30</td>
<td>Math. 30 for Bus. &amp; Acct Students</td>
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<td>Math. of Investment</td>
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<td>Psych.</td>
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<td>Psychology of Business</td>
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<td>P.S.</td>
<td>11-12-13</td>
<td>Commercial Law</td>
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<tr>
<td>S.S.</td>
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<td>Indexing and Filing</td>
<td>3*</td>
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*Urgently recommended.*
**Junior Year**

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<tr>
<td>B.A.</td>
<td>101-2-3</td>
<td>Problems in Acctg. Principles</td>
<td>9·</td>
<td>9·</td>
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<tr>
<td>Econ.</td>
<td>125-6-7</td>
<td>Labor Problems</td>
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<td>3·</td>
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<tr>
<td>Math.</td>
<td>111</td>
<td>Elementary Stat. Methods</td>
<td>5·</td>
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<tr>
<td>B.A.</td>
<td>129</td>
<td>Governmental Accounting</td>
<td>3·</td>
<td>3·</td>
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<tr>
<td>Soc.</td>
<td>140</td>
<td>Social Psychology</td>
<td>3·</td>
<td>3·</td>
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<tr>
<td>B.A.</td>
<td>141</td>
<td>Real Estate</td>
<td></td>
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<tr>
<td>Econ.</td>
<td>147</td>
<td>Social Security</td>
<td></td>
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<tr>
<td>B.A.</td>
<td>151-2-3</td>
<td>Prob. in Merchandising</td>
<td></td>
<td></td>
<td>9·</td>
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<tr>
<td>B.A.</td>
<td>155</td>
<td>Personnel Administration</td>
<td></td>
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<tr>
<td>B.A.</td>
<td>156</td>
<td>Principles and Probl. of Advt.</td>
<td></td>
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<td>5·</td>
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<tr>
<td>Econ.</td>
<td>161-2-3</td>
<td>Problems in Retail Distribution</td>
<td></td>
<td></td>
<td>9·</td>
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<tr>
<td>Econ.</td>
<td>145</td>
<td>Economics of Consumption</td>
<td></td>
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<tr>
<td>Econ.</td>
<td>185</td>
<td>Money and Credit</td>
<td>3·</td>
<td>3·</td>
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<tr>
<td>P.S.</td>
<td>104-5-6</td>
<td>Commercial Law</td>
<td>9·</td>
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**Senior Year**

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<tr>
<td>B.A.</td>
<td>111</td>
<td>Cost Accounting</td>
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<td>B.A.</td>
<td>105-6-7</td>
<td>CPA Problems</td>
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<td>B.A.</td>
<td>104</td>
<td>Accounting Systems</td>
<td>5·</td>
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<td>B.A.</td>
<td>120-21-22</td>
<td>Auditing Principles</td>
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<td>B.A.</td>
<td>126</td>
<td>Accounting Seminar</td>
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<tr>
<td>B.A.</td>
<td>127-128</td>
<td>Income Tax Accounting</td>
<td>6·</td>
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<tr>
<td>B.A.</td>
<td>130</td>
<td>Investments</td>
<td>5·</td>
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<tr>
<td>Econ.</td>
<td>131-2</td>
<td>Business Statistics</td>
<td>6·</td>
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<tr>
<td>B.A.</td>
<td>133</td>
<td>Industrial Management</td>
<td>5·</td>
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<tr>
<td>B.A.</td>
<td>135</td>
<td>Budgets</td>
<td>3·</td>
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<tr>
<td>B.A.</td>
<td>149</td>
<td>Business Policy</td>
<td>5·</td>
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<tr>
<td>B.A.</td>
<td>154</td>
<td>Industrial Purchasing</td>
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<tr>
<td>B.A.</td>
<td>160</td>
<td>Sales Management</td>
<td></td>
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<tr>
<td>B.A.</td>
<td>164</td>
<td>Credit Administration</td>
<td>4·</td>
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<tr>
<td>Sec.Sc.</td>
<td>175</td>
<td>Office Management</td>
<td>3·</td>
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<tr>
<td>Econ.</td>
<td>107-8</td>
<td>Advanced Economics</td>
<td>6·</td>
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<tr>
<td>Econ.</td>
<td>171</td>
<td>Economics of Business Cycles</td>
<td>3·</td>
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<tr>
<td>P.S.</td>
<td>107-8</td>
<td>Commercial Law</td>
<td>6·</td>
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</tbody>
</table>

Note: Inasmuch as some of the above courses are taught only every other year, 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 Returning Veterans Who Are Not Candidates for Degrees**

For capable, mature persons whose education has been interrupted by the war 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 Commerce. These courses minimize liberal course offerings and concentrate upon vocational and professional courses. One gives training in merchandising and the other in accounting. Only those students who know definitely that they will not seek a degree should pursue these courses and then only after consultations with the head of the department. A special course in problems of small business is included.

**ACCOUNTING**

1. **Introductory Accounting.** Presents basic principles of accounting in the form of lectures, questions, problems and practice sets which require application of the theory advanced. Principles and techniques learned here will be useful as a basis for further study of accounting and as an aid in the understanding of the more common problems of business. Technique will be emphasized.

   (B.A.1:5F or W) (B.A.2:5W or S)

   Cannon

   *Urgently recommended.*
Burrough's Calculator. (See Secretarial Science 94.)
Commercial and Bank Posting. (See Secretarial Science 98.)
Mathematics for Business and Accounting Students. (See Math. 30.)


Mathematics of Investment. (See Math. 60.)

100. Accounting for Non-Commercial Students. A brief course for students in Engineering, Agriculture, Home Economics, Forestry, and other non-Commercial students. (3F, W or S) Gardner

100L. Accounting for Non-Commercial Students. Laboratory optional for those taking accounting 100. Recommended where possible. (1F, W or S) Gardner

101, 102, 103. Advanced Accounting Principles. A basic course in the fundamental technique and principles of accounting. To give a working knowledge of accounting as it serves the business executive is the primary aim of this course. It should prove valuable to students who aspire to a career in accounting, and also to teachers, lawyers, engineers and farmers. Interpretation and use of accounting as a tool of management is emphasized. Since facility in analysis can be acquired only through abundant practice, a variety of problems and home assignments are provided. Graduate credit may be allowed upon the completion of some additional work. (4F, W, S) Gardner

104. Accounting Systems. Accounting and personnel problems involved in the development and installation of systems of accounting. Among topics covered in the first half of course are objectives of the accounting system; planning the system to provide the information needed by management; chart of accounts; accounting records; and business papers and office routine. The second half of course is devoted to problem work in designing systems for specific businesses. (3F) Cannon

105, 106, 107. CPA Problems. Selected problems from professional examinations of various states. (3F, W, S) Cannon

111. Industrial Cost Accounting. Process cost accounting, standard costs, estimating cost systems, distribution costs, special considerations. (SW) Gardner

120, 121, 122. Auditing Theory and Practice. Auditing principles and procedures, presented to give a practical knowledge of auditing. Prerequisites: A good working knowledge of accounting principles and techniques. (3F, W, S) Cannon

126. Accounting Seminar. (2S) Cannon


129. Governmental Accounting. Basic principles underlying the treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. (3F) Gardner

BUSINESS ADMINISTRATION

Business Communications. (See Secretarial Science 30.)

20. Problems of Small Business. A survey of problems encountered in starting a small business. Consideration is given problems encountered before operations are started, such as selecting the right type of business, form of business, permits, licenses, choosing a location, credit and financing. In addition, the problems and details of actual operating procedures such as accounting controls, insurance, taxes, buying and selling are considered in relation to various types of small business operation. Designed to aid the man just entering business. (3W or S) Ellington


28. Business Finance. The structure of the corporate enterprise; providing for a new company; expansion of existing companies; recapitalization and re-
organization of the corporation. Financial and operating ratios are discussed. Proper financial plans and methods of marketing securities are also considered. Open to qualified sophomores. Practical problems of small business are emphasized. Prerequisites: Econ. 51, 52 or equivalent, B.A. 1, 2. (5S)

30M. Business Mathematics. For students in B.A. (3F or W)

Commercial Art and Posters. (See Art 31.)

Color. (See Art 32.)

Psychology of Business and Industry. (See Psychology 55.)

55. Introduction to Personnel Administration. The background and development of the personnel function. Personnel tools, records, tests, training programs, rating methods, wage and salary policies, and maintenance of morale. Prerequisites: B.A. 20 or 25; Econ. 51, 52. (3W)

B.A. 59. Blueprint Reading and Industrial Drawing. (See Civil Engineering)

59. Required of all sophomore majors in Business Administration.

Mathematics of Investment. (See Math. 60.) Urged for all accounting and business administration majors.

Indexing and Filing. (See Sec. Sc. 65.)

Elementary Statistical Methods. (See Math. 110 or 111.) Recommended for accounting and business administration majors.

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

130. Investment Principles. Part 1 deals with basic principles of investment including characteristics of bonds and stocks; operation of securities markets; sources of information; interpreting financial news; mathematics of investment. Part 2 deals with analysis of different types of securities. (3W)

133. Industrial Management Problems. Selected cases are taken up for study and report. 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. Prerequisite: B.A. 25 or B.A. 20. (5F)

135. Budgets. Organization and practical application of the budget in modern business. Emphasis is given managerial aspects of budgets as an instrument of control. Practical problems in formulation and execution of business budgets. (3S)

Risk and Risk Bearing. (See Economics 139.)

140. Insurance. Studied primarily from the standpoint of the consumer of insurance services. Among the topics treated are: types of life and property 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. Attention also given findings of the Temporary National Economic Committee in its study of the life insurance industry. (3F)

Social Psychology. (See Sociology 140.) Recommended for all business administration majors.

141. Real Estate. For those who will be considering the purchase of real estate and of securities based upon real estate, and as an introduction to the general field of real estate contracts, forms, and principles. Recent Federal housing legislation is analyzed. (3W)

Social Security. (See Econ. 147.) Strongly recommended for all business administration majors.

149. Business Policy. A co-ordinating course aimed to develop perspective and judgment and facility in solving business problems. Problems are discussed in production, distribution, personnel, finance, control, legal and ethical aspects of business. Required of all majors in Business Administration. (5S)

155. Personnel Administration. A critical analysis of the problems of labor management which confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems and selected cases. (3S)


**BUSINESS AND DISTRIBUTIVE EDUCATION**

The School of Commerce and the School of Education cooperate in meeting the demand for well-trained teachers of business subjects. In the selection of their courses in Business Administration, Secretarial Science, and Education, students should consult with Professor Neuberger.

179. **Methods of Teaching Typewriting and Bookkeeping.** (3W)

180. **The Teaching of Shorthand.** (3) (Not given 1949-50)

189. **Practicum in Business Education.** (1-2F, W or S)

190. **Seminar in Business Education.** (2S)

191. **Problems in Teaching Business Subjects.** (3Su)

194. **Principles and Objectives of Distributive Education.** (3Su)

195. **Part-time Distributive Education.** (3Su)

200. **Research in Business Education.** Credit arranged. (F, W or S)

Students who wish to qualify for a teaching certificate in General Business or Distributive Education should take the following courses. Those who wish to qualify for a certificate with a major in Secretarial Science should refer to the curriculum outlined in that department.

<table>
<thead>
<tr>
<th>Dept.</th>
<th>No.</th>
<th>TITLE OF COURSE</th>
<th>General Business Education</th>
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<tbody>
<tr>
<td>BA.</td>
<td>1-2</td>
<td>Introductory Accounting</td>
<td>10</td>
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<tr>
<td>BA.</td>
<td>20-25</td>
<td>Int. Business or Small Business</td>
<td>9</td>
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<tr>
<td>BA.</td>
<td>28</td>
<td>Business Finance</td>
<td>8</td>
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<td>BA.</td>
<td>30M</td>
<td>Business Mathematics</td>
<td>8</td>
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<tr>
<td>Econ.</td>
<td>51-52</td>
<td>General Economics</td>
<td>8</td>
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<tr>
<td>Psy.</td>
<td>55</td>
<td>Business Psychology</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>62</td>
<td>Principles of Marketing</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>63</td>
<td>Salesmanship</td>
<td>8</td>
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<tr>
<td>S.Sc.</td>
<td>65</td>
<td>Indexing and Filing</td>
<td>8</td>
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<tr>
<td>Econ.</td>
<td>107-109</td>
<td>Intermediate Economic Theory</td>
<td>8</td>
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<tr>
<td>Econ.</td>
<td>131-132</td>
<td>Business Statistics</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>133</td>
<td>Industrial Mgt. Problems</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>149</td>
<td>Business Policy</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>151-2-3</td>
<td>Problems in Merchandising</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>156</td>
<td>Principles of Advertising</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>161-2-3</td>
<td>Problems in Retail Distribution</td>
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<tr>
<td>B.A.</td>
<td>113</td>
<td>Vocational Guidance</td>
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<td>B.A.</td>
<td>114</td>
<td>Organization and Administration</td>
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<tr>
<td>B.A.</td>
<td>116 or 141</td>
<td>Articulation of Ed. or Social Ed.</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>111</td>
<td>Principles of Education</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>194</td>
<td>Principles &amp; Objectives of Distributive Ed.</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>127</td>
<td>Secondary School Methods</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>129-130</td>
<td>Student Teaching in the Secondary School</td>
<td>8</td>
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<tr>
<td>S.Sc.</td>
<td>179</td>
<td>Meth. of Teaching Typewriting &amp; Bookkeeping</td>
<td>8</td>
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<tr>
<td>B.A.</td>
<td>195</td>
<td>Part-time Distributive Education</td>
<td>8</td>
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Students following the General Business Curriculum may take B.A. 151-2-3 or 161-2-3.
62. **Principles of Marketing.** (See Ag. Econ. 52.) Required of all majors in business administration.

63. **Salesmanship.** The history, development and opportunities in sales work are covered. The necessity and methods of securing proper preparation for sales work in order to meet the problems encountered in both direct selling and retail selling are analyzed. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance are studied. For those who desire, special projects can be carried out in relation to a particular field or type of selling. Lectures and assigned cases. (4F or 5)

**Ellington**

147. **Administration of Small Business.** An intensive course for students in Engineering, Technology, and Agriculture. Attention given factors that determine whether a business should be started, the form of the business and such operating problems as accounting and statistical control, financial control and problems of marketing. (3F, W) **Staff**

151. **Problems in Merchandising.** The aim is to present by means of carefully selected cases the manager's merchandising problems. 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) **Ellington**

154. **Purchasing.** Involves a study of the significance of purchasing as a major activity in modern business. Consideration given organization, policies and control of the procurement function. Lectures and problems. (4W) **Ellington**

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. Actual cases are studied and analyzed to lead the student to judge the possibilities of advertising as a sales tool for various products and firms. Selected reading and cases. (5S) **Ellington**

160. **Sales Management.** Aims to give a broad view of the important phases of sales administration, planning and execution as applied to manufacturing and wholesale concerns. It deals specifically with the structure and functioning of the sales organization and the correlation of its activities with those of the production and other departments of the business enterprise. Specific attention is given such topics as: marketing policies, sales planning, sales branches, selection and training of sales force, control of sales operations, sales budget, volume margins and profits. (5S) **Ellington**

161. **Problems in Retail Distribution.** For students who wish to gain an understanding of the marketing field from the viewpoint of the retail distributor. The problems given major attention are: 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. Selected reading and cases. (3F, W, S) **Staff**

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

**Economics**

W. L. Wanlass, Professor; Evan B. Murray, Associate Professor; Leonard J. Arrington, Norman S. Cannon, Leo M. Loll, Jr., Assistant Professors.

See pages 43 and 44 for courses which may satisfy group requirements.

Students majoring in this Department should include the following Upper Division courses in either the major or related work: Economics 106, 107, 108, 125, 131, 135, 140, 147, 155, 155, 171, 174, 211; Agricultural Economics 113a; Business Administration 101, 102; Political Science 105, 106, 107, 108, 116.
MASTER OF SCIENCE DEGREE IN ECONOMICS

The Economics Department offers a program of study leading to the Master of Science degree. The following courses may be taken in preparation for this degree: Economics 107a, 107b, 125, 131, 132, 155, 165, 171, 174, 200, 205, 206, 207, 209, 211.

The following may be taken for graduate credit by students in other departments: 107a, 107b, 125, 135, 165, 171, 174, 200, 205, 206, 207, 209, 211.

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)

27. Economic Development of the United States. The historical development of economic factors. Particular attention is given the rise of the American labor movement, the development of the monetary and banking system, the evolution of commerce and communication, and the course of American industrial development from the small one-man business of early times to the great corporations of today. (3W)

28. Economic Geography. The physical environment and climate and their effects on man and civilization. A survey of world resources, commerce and industry. The factors of location and trade. (3S)

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

52. Economic Problems. A continuation of Economics 51. The problems of labor, finance, economic instability, international economics, social waste, government control, and world economic systems. Required as a prerequisite to all senior college courses in the School of Commerce except in Agr. Econ. (5F, W or S)

106. History of Economic Thought. A critical study of the origin and the development of the economic theories of leading thinkers in leading nations of the world from 1750 to the present. (3F) (Not offered in 1949-50)

107, 108. Intermediate Economic Theory. A critical analysis of present-day economic theories of value, distribution, and related subjects. Must be taken by all students majoring in Bus. Adm., Agr. Econ., and Econ. Prerequisites: Econ. 51, 52 or Ag. Econ. 53a, 53b. (3W or S)

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 system; policy issues. (3F)

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

131, 132. Business Statistics. Application of statistical methods to business problems with attention to graphs, analysis of time series, interpretation of index numbers and the statistics of particular industries and business in general. Prerequisites: Math. 111; Econ. 51 and 52. This course may be used for a major in Bus. Adm. (3W, S)

135. Transportation Economics. Emphasis is placed on railroad transportation in the United States. Some attention given highway and airway transportation. The underlying economic principles receive more attention than the practical phases of transportation. Special attention given those problems peculiar to the intermountain section. Prerequisites: Econ. 51, 52. (3F)

139. Risk and Risk Bearing. The risks of economic life. Hedging, the short sale, futures and spot transactions, and the produce and stock exchanges are studied as well as the institution of insurance. Methods of shifting, reducing and assuming risks are studied. Prerequisites: Econ. 51, 52. (3S)

140. International Economic Relations. Special attention is given basic economic relationship between industrial nations of the world, international commerce, tariffs, and trade restrictions, international debt and finance, and various means of promoting progress on a basis of sound economics. Prerequisites: Econ. 51, 52 (2F)
141. Current Economic Problems. A study, based on current reading material, of how to achieve and maintain full production, full employment, and economic stability in the United States and other national economies. (2F) Arrington

145. Economics of Consumption. There is an economics of consumption that is as important as the economics of production. This course deals with personal and group expenditures, standards of living, budgets, variations in consumption, etc. (3W) Wanless

147. Social Security. A survey of the main divisions of social security legislation; workers' compensation, legal minimum wage, regulation of hours, unemployment compensation, old age insurance, family wage systems, and health insurance. Prerequisites: one course in Economics and one in Political Science. (3S) Murray

150. Comparative Economic Systems. The more important present forms of economic organization: their history, theory, and practices. Emphasis on Capitalism, British Socialism, German Fascism, and Soviet Communism. (3S) Staff


165. Money, Credit and Prices. The structure and operations of money and financial institutions. Special attention given bimetallism, the gold standard, the money market and the relation of money and credit to prices. Prerequisite: Econ. 51, 52. (3F) Wanless

171. Business Cycles. The economics of cyclical fluctuations. A 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) Lillich

174. Corporate Concentration and Public Policy. The history and development of giant corporations; the extent, characteristics, and significance of corporate monopolies and oligopolies; international cartels. Possible public policies anti-trust activity, cooperatives, government regulation, government operation. (3S) Arrington

175. Public Utility Economics. Public utility operations, regulation and problems. The semi-private, semi-public nature of the utilities renders them an especially apt subject for special treatment in a period when the question of government ownership vs. government control is under consideration. Prerequisites: Econ. 51, 52. (3S) Wanless

200. Research in Economics. Special investigations in problems in economics may be carried on by senior and graduate students. Credit granted according to work done. (F, W or S) Wanless

205. Graduate Seminar in Monetary and Banking Theory. The relation of monetary and banking theories to the problems posed by current world difficulties is examined in some detail. Open to graduate students and seniors with adequate preparation. (2) Murray

206. Graduate Seminar in Fiscal and Tax Problems. Problems of attaining economic stability through use of government fiscal policy. Attention focuses upon problems which have resulted from World War II. (2) Wanless

207. Graduate Seminar on Monopoly and Combination. Our economic society has been characterized by freedom of enterprise and competition, but numerous public and private attempts have been made to control the production and marketing of agricultural and industrial commodities. The growth, development, and present status of these control schemes, both domestic and international, are traced and appraised. (2) Arrington

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) Wanless

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 projects; analysis and evaluation of current issues in the field of labor. (2) Murray

Political Science

F. D. Daines, Professor Emeritus; M. R. Merrill, Asa Bullen, Professors; Wendell Anderson, Assistant Professor.

See pages 43 and 44 for courses which may satisfy group requirements.

Students majoring in this department 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 departmental faculty.

1. Government and the Individual. Introduces the student into the political world of American democracy. Study is made of totalitarian governments and the philosophies of fascism and communism which form the theoretical bases of these regimes. Democracy as practiced in the United States and Great Britain is contrasted with these systems. (SF or W) Merrill

10. American National Government. Major attention is given to the national government. It is desirable but not required that it be taken before upper division courses in Political Science. (SF, W or S) Staff

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

15. American State and Local Government. The emphasis is on state municipal and county or rural governments. It follows Political Science 10. (5S) Staff

20. 21. Government in the Modern World. A general study of government designed particularly for students majoring in professional fields and particularly for students in the School of Engineering. Other students, however, may register for this course but students who register for Political Science 1 should not register for either 20 or 21. Basic features of the American governmental system are discussed in 20, while other contemporary political systems are discussed in 21. Students may take either or both quarters without prejudice. (3F. 3W) Merrill

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) Daines

75. Latin American Governments. The various Latin American governments are discussed. Attention also is given political and economic relations of the United States with the Latin American states. (3S) Anderson

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

102. International Political Relations. Psychological, economic, racial, and other obstacles to international cooperation, as exemplified in recent events The Treaty of Versailles; international law, the League of Nations; and present-day politics including the present program for world cooperation and government are discussed. (3W) Merrill

104. 105, 106, 107, 108. Commercial Law. Course 104 is a study of the law of negotiable instruments, while 105 and 106 include the study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the study of 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 1949-50. Prerequisites: Political Science 11, 12, 13. (3F. 3W. 3S) Bullen
110. **Post-War Problems in International Relations.** Examines the various proposals for a world organization now being made and instituted together with an analysis of the various philosophies and systems of government that conceivably might arise as a result of vast changes now evident in the world. (3S) Daines

111. **International Organization.** Examines briefly the attempt of the past to achieve some type of international organization. Major emphasis on League of Nations and United Nations, particularly the latter. Also a limited examination of other programs now suggested. (3S) Anderson

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) Anderson

124. **Public Opinion and Propaganda.** Open to upper division and graduate students, and to lower division students upon recommendation of the departmental instructors. Considers politics in its dynamic aspects. The nature of public opinion and the various concepts and techniques of propaganda in domestic and international relations employed by pressure groups, political parties and national states. No prerequisite. (3F) Daines

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

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

129. **Public Administration.** An introduction to the study of public administration and administrative law 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

140. **American Legislation.** Organization and procedure of legislative bodies. Influences at work in and the character of the output of the 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 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) Daines

150. **Recent Political Thought.** Political ideas and writers from the close of the 18th Century to the present, with a particular emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3S) Daines

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

200. **Research in Political Science.** For senior and graduate students. Time and credit arranged. (2F, 2W, 2S) Staff

204, 205, 206. **Seminar in Political Science.** This is 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

**Secretarial Science**

V. D. Gardner, Professor; L. Mark Neuberger, Associate Professor; Ina Doty, Clara P. West, Assistant Professors.

Students majoring in Secretarial Science must complete the following courses in addition to the institutional requirements for graduation. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.
### Curriculum in Secretarial Science for B.S. Degree

<table>
<thead>
<tr>
<th>Dept.</th>
<th>No.</th>
<th>Title of Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sec. Sci.</td>
<td>30</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>65</td>
<td>Indexing and Filing</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>75,76,77</td>
<td>Elementary Shorthand</td>
<td>9</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>80,81,82</td>
<td>Intermediate Shorthand</td>
<td>9</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>69,70,71</td>
<td>Transcription Practice</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>86,87,88</td>
<td>Elementary Typewriting</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>89,90,91</td>
<td>Advanced Business Typewriting</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>94</td>
<td>Burroughs Calculator</td>
<td>2</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>90</td>
<td>Commercial and Bank Posting</td>
<td>2</td>
</tr>
<tr>
<td>Math.</td>
<td>30</td>
<td>Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>B. A.</td>
<td>1,2</td>
<td>Introductory Accounting</td>
<td>10</td>
</tr>
<tr>
<td>B. A.</td>
<td>25</td>
<td>Introductory Business Administration</td>
<td>5</td>
</tr>
<tr>
<td>English</td>
<td>2</td>
<td>Mechanics of Writing</td>
<td>3</td>
</tr>
<tr>
<td>English</td>
<td>5</td>
<td>Scientific Vocabulary (or Foreign Language)</td>
<td>3</td>
</tr>
<tr>
<td><em>Econ.</em></td>
<td>51</td>
<td>General Economics</td>
<td>5</td>
</tr>
<tr>
<td><em>Econ.</em></td>
<td>52</td>
<td>Economic Problems</td>
<td>5</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>170</td>
<td>Statistical Typewriting</td>
<td>2</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>175</td>
<td>Office Management</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>183,184,185</td>
<td>Advanced Speed Shorthand</td>
<td>9</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>186,187</td>
<td>Secretarial Science</td>
<td>6</td>
</tr>
<tr>
<td><em>Sec. Sci.</em></td>
<td>179</td>
<td>Methods of Teaching Typewriting</td>
<td>3</td>
</tr>
<tr>
<td><em>Sec. Sci.</em></td>
<td>180</td>
<td>Methods of Teaching Shorthand</td>
<td>3</td>
</tr>
<tr>
<td>Sec. Sci.</td>
<td>190</td>
<td>Seminar in Business Education</td>
<td>2</td>
</tr>
<tr>
<td>B. A.</td>
<td>101</td>
<td>Problems in Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>B. A. Elective</td>
<td>Business Administration (Senior College)</td>
<td>3</td>
<td></td>
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<tr>
<td>Econ. Elective</td>
<td>Economics (Senior College)</td>
<td>3</td>
<td></td>
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<tr>
<td>Electives</td>
<td></td>
<td>Electives (27 of which must be Senior College)</td>
<td>42</td>
</tr>
</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.

A two-year course is also offered in Secretarial Science for students who do not wish to qualify for a B.S. degree but who wish to fit themselves for stenographic positions as quickly as possible.

### Two-Year Secretarial Course

#### First Year

<table>
<thead>
<tr>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>Biography</td>
</tr>
<tr>
<td>Mechanics of Writing</td>
</tr>
<tr>
<td>El. Shorthand</td>
</tr>
<tr>
<td>Typewriting</td>
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<tr>
<td>P. E. or M. S.</td>
</tr>
<tr>
<td>Mathematics</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses</td>
</tr>
<tr>
<td>Accounting 1</td>
</tr>
<tr>
<td>Calculating 94</td>
</tr>
<tr>
<td>El. Shorthand</td>
</tr>
<tr>
<td>Typewriting</td>
</tr>
<tr>
<td>El. Psychology</td>
</tr>
<tr>
<td>P. E. or M. S.</td>
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<tr>
<td>Total</td>
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</table>

#### Second Year

<table>
<thead>
<tr>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>Int. Shorthand</td>
</tr>
<tr>
<td>Transcription Pract.</td>
</tr>
<tr>
<td>Adv. Typewriting</td>
</tr>
<tr>
<td>Bus. Administ'ren 25</td>
</tr>
<tr>
<td>Indexing and Filing</td>
</tr>
<tr>
<td>Pol. Science</td>
</tr>
<tr>
<td>P. E. or M. S.</td>
</tr>
<tr>
<td>Total</td>
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</table>

<table>
<thead>
<tr>
<th>Winter</th>
</tr>
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<tbody>
<tr>
<td>Courses</td>
</tr>
<tr>
<td>Int. Shorthand</td>
</tr>
<tr>
<td>Transcription Pract.</td>
</tr>
<tr>
<td>Adv. Typewriting</td>
</tr>
<tr>
<td>Economics</td>
</tr>
<tr>
<td>Pol. Science</td>
</tr>
<tr>
<td>P. E. or M. S.</td>
</tr>
<tr>
<td>Electives</td>
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<tr>
<td>Total</td>
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#### Spring

<table>
<thead>
<tr>
<th>Courses</th>
</tr>
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<tbody>
<tr>
<td>Fall</td>
</tr>
<tr>
<td>Sophomore Comp.</td>
</tr>
<tr>
<td>Int. Shorthand</td>
</tr>
<tr>
<td>Transcription Pract.</td>
</tr>
<tr>
<td>Adv. Typewriting</td>
</tr>
<tr>
<td>Economics</td>
</tr>
<tr>
<td>P. E. or M. S.</td>
</tr>
<tr>
<td>Office Practice</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

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1—These courses count toward filling the group requirements.
2—Required for a teaching certificate.
30. **Business Communications.** Fundamental principles of business letter writing. Practice in writing sales, order, collection, adjustment, and application letters. Prerequisite: English 2. (3W or S) **Neuberger**

65. **Indexing and Filing.** Drill and practice in alphabetic, numeric, triple check automatic, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters, cards, blue-prints, catalogs, and other business forms. (3F, W or S) **Neuberger and Doty**

67 or 167. **Office Practice.** Practical training in use of dictating and transcribing machines, mimeograph, drawing board, switchboard, and other office machines. Required of students majoring in Secretarial Science and those completing the Two-Year Course. (2F, W or S) **Staff**

69. **Transcription Practice.** Designed to develop skill and speed in the transcription of letters from shorthand notes. Students must be able to take dictation at not less than 50 words a minute and type at least 40 words a minute. (1F or W) **West and Doty**

70. **Transcription Practice.** Continuation of 69. (1W or S) **West and Doty**

71. **Transcription Practice.** Continuation of 70. (1W or S) **Doty**

75. **First Quarter Shorthand.** For students who have had no previous training in shorthand; includes a study of the fundamentals of shorthand by the functional method. Emphasis on developing fluency in reading and writing from shorthand plates. (3F or W) **West and Doty**

76. **Second Quarter Shorthand.** Continuation of course 75. Emphasis on the writing of shorthand. (3F or W) **West and Doty**

77. **Third Quarter Shorthand.** Continuation of course 76. Practice in new-matter dictation. (3F or S) **Doty and West**

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 a minute. Includes a review of the theory of Gregg shorthand and the development of new vocabulary and phrase writing. Students must be able to type at least 40 words a minute and must register for Transcription Practice 69. (3F or W) **Doty and West**

81. **Intermediate Shorthand.** Continuation of 80. Must be accompanied by Transcription Practice 70. (3W or S) **Doty and West**

82. **Intermediate Shorthand.** Continuation of 81. Must be accompanied by Transcription Practice 71. (3S) **Doty**

86. **First Quarter Typewriting.** For students who have had no previous training in typewriting. Designed to develop a thorough knowledge of the keyboard and to give practice in the use of the mechanical features of the typewriter. Special attention to the developing of typewriting for personal use. (1F, W or S) **Doty and Neuberger**

87. **Second Quarter Typewriting.** Continuation of 86. Attention given sentence and paragraph practice and letter writing. (1W or S) **West and Doty**

88. **Third Quarter Typewriting.** Completion of style letters. Training in tabulation, continuity writing, and direct dictation. (1W or S) **Neuberger**

89. **Advanced Business Typewriting.** For students who have had one year of typewriting. Special attention given advanced letter writing, telegrams, invoices, billing, and tabulation. (1F) **Neuberger**

90. **Advanced Legal Typewriting.** Preparation of legal forms and manuscripts. (1W) **Neuberger**

91. **Advanced Secretarial Typewriting.** Work on rough drafts, advanced secretarial problems, and civil service copy. (1S) **Neuberger**

94. **Burroughs Calculator.** Practice in addition, multiplication, subtraction, and division on Burroughs calculators and the application of the machine to various business computations such as percentages, discounts, prorating, decimal equivalents, and constants. (2F, W or S) **Neuberger and Doty**

96. **Elliott-Fisher Bookkeeping Machine.** Application of the Elliott-Fisher Machine to business and accounting problems. (1-2F, W or S) **Neuberger and Doty**

*Required of all who register for Intermediate Shorthand 80, 81, 82.
98. Commercial and Bank Posting. Practice in the application of the Burroughs posting machine to bookkeeping procedures in commercial and financial institutions and banks. (2F, W or S) Neuberger and Doty
170. Statistical Typewriting. For juniors and seniors majoring in business administration, economics, and secretarial science. Practice will be given in setting up charts, tables, and reports. Prerequisite: Sec. 99, 90 and 91 or equivalent work. (2F) Neuberger
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: introductory accounting and general economics. (3F) Neuberger
*179. Methods of Teaching, Typewriting and Bookkeeping. Recent developments and practices in the teaching of Typewriting and Bookkeeping. Analysis of objectives, laws of learning, organization of materials, texts, standards of achievement, and methods of presentation. (3) Neuberger

*180. The Teaching of Shorthand. Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3W) West

*Either (but not both) of these courses may be used as an elective in Education.

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) West
186. 187. Secretarial Science. Designed to acquaint students with office routines and procedures and to give practice in quantity production of transcripts and business papers. Includes training in operation of Ediphone. Attention given office conduct and attitudes, personal qualities of a secretary, and the procuring of a position. Prerequisite: Two years of shorthand and typewriting, general economics, introductory accounting, and business communications. (3W, 3S) West

189. Practicum in Business Education. Provides an opportunity for the planning and development of practical or creative projects in Business Education. Experienced teachers and students, who are registered for teacher training work, are encouraged to build projects around actual school situations. (1-2F, W or S) Neuberger

190. Seminar in Business Education. A reading and research course for junior and senior students majoring in business administration and secretarial science. Special reports on current business education problems and literature are made. (2S) Neuberger

200. Research in Business Education. For senior and graduate students. Time and credit arranged. (F, W or S) Neuberger

Sociology

Joseph A. Geddes, Professor; Joseph N. Symons, Lawrence S. Bee, R. Welling Roskelley, Associate Professors; Carmen Frederickson, Assistant Professor.

All majors in Sociology are expected to take basic background courses in the biological sciences, the humanities and in each of the social sciences, as well as the more basic courses in each field of emphasis within the department. Such courses as Soc. 10 or 70, 40, 52, 60, 87, 110, 141, and S. W. 177 should be taken by all majors. Two options are open:

1. A major may seek a balanced integration into the entire field of Sociology without emphasis in any portion of it. If this choice is made specialization is deferred to the graduate level.

2. A major may, after or concurrently with taking the basic courses named above, elect one of the five following fields for emphasis.

Rural Sociology
Courses are arranged to give the student special training in rural sociology which will help him function in a professional capacity or as a more effective lay citizen. In the professional field he may shape his course to qualify as a teacher, research worker, extension specialist, or as an employee of a governmental or private agency. As a lay citizen he may contribute much toward the development and promotion of programs making for better living. Required: Soc. 130, 154, 156, 187, S. W. 180. Sustaining: Soc. 70, 160, 170, S. W.. 173.

The Family

Offerings in the field of the family are planned to meet three functions: namely, (1) to contribute to the student's general education, (2) to provide a better foundation for marriage and family living, and (3) to offer professional training in the field of the family—teaching, counseling, adult education, etc. It is suggested that students who plan to concentrate their studies in the family area gain as broad and intensive a background in the social and biological sciences and the humanities as possible. Required: Soc. 130, 154, 160, 161. S. W. 174. Sustaining: Soc. 158, 170, S. W. 162.

Crime and Delinquency

Among the social pathologies within the realm of sociology which are of grave concern to society are the problems of crime and delinquency. For those interested in this area an attempt is made to give sound information on amounts, trends, causation, treatment and prevention. For those specializing as school coordinators, probation and parole officers, institutional workers, youth authority employees, etc. Required: Soc. 152, 170, S. W. 162, 182. Sustaining: Soc. 130, 154, 172, S. W. 173, 174.

Community and Social Organization


Social Work

The undergraduate program in social work is organized to prepare students for employment in some of the numerous positions in the field for which full professional training is not required. The program also provides an educational background for students who may later undertake graduate study. Positions in Utah and surrounding states for which the undergraduate program is intended to offer preparation include those of public assistance workers, counselors in children's institutions, and probation officer. Required: S. W. 162, 173, 174, 175, 180, 192, 18, 195, Soc. 110, 170. Sustaining: Soc. 140, 170 Econ. 147, Psy. 102, 188, C. D. 60.

Either Soc. 10 or 70 is prerequisite for all upper division courses in Sociology; also Soc. 40 for 140, 60 for 160, 52 for 152, 87 for 187 and S. W. 187.

MASTER OF SCIENCE DEGREE IN SOCIOLOGY

The Department of Sociology offers work leading to the Master of Science Degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies. Students majoring in Sociology may use the following courses of the 100 series for graduate credit: Sociology 100, 110, 130, 140, 141, 152, 154, 160, 170 and Social Work 173, 177.

The courses above listed may also be used by students in other departments for graduate-credit.

THE Ph.D. DEGREE IN SOCIOLOGY

Institutional requirements for the Ph.D. Degree are explained in the section dealing with the Graduate School. This degree is offered in the Department of Sociology through collaboration with closely related departments in the social sciences. Resources are now being expanded in the field of Rural Sociology, in which major emphasis is now being made. A program of building resources for emphasis in general Sociology is also contemplated.

10. Rural Sociology. Attempts to provide a groundwork of information which will lead to enlightened rural citizenship and provide a constructive philosophy for living in the country. Concise digests of programs in 25 or more fields are
made. Rural social psychology is given emphasis. Conditions in rural Utah are studied. (SF, W or S)  

40. Social Psychology I. Personality development among different social classes and peoples. Analysis of crowds, publics, social movements and other collective behavior; ideologies and institutions. Prerequisites: Soc. 70 and Psych. 3. (3W)  

44. Women Today. The progress of women in American society from colonial days to the present. Some attention given women's struggle for status in industry, politics, education, sex, religion, and the arts. Roles and contributions of outstanding women reviewed. (3F or S) C. Fredrickson

52. The Crime Problem. The broader aspects of crime as a serious contemporary problem. Such topics as the extent, nature, causes of, theories concerning, techniques for coping with, programs for prevention, etc., furnish the course content. (3F) Symons

60. Courtship, Marriage and the Family. Designed to help unmarried and married students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. (3F, W or S) Bee

70. Principles of Sociology. The major propositions inherent in man's influence on other men and his being influenced by other men in association. Culture, groups, personality, crowds, publics, social processes, ecological processes, institutions, etc., receive attention. Soc. 10 or 70 is prerequisite for all Upper Division classes. (5F, W, or S) Staff

87. Elementary Social Statistics. Techniques of using statistical method in studying social problems with emphasis upon logical methods of collection, tabulation, graphic portrayal, averages, dispersion, reliability, elementary sampling and simple correlation with brief consideration of the theoretical implications. Majors in Sociology and Social Work should take this course. (3F) Roskelley

100. Educational Sociology. The influence of the social processes and social changes on school curricula, objectives and teachers. It includes an appraisal of educational goals in the light of present social needs. (3F) T.B.A.

110. Utah Social Problems. Problems dealing with present conditions in fields such as population, migration, housing, insurance, manufacturing, temperature, safety, etc., are studied and analyzed. (3W) Geddes

130. Introduction to Cultural Anthropology. Treatment of the attitudes, ideas, behavior, basic personality organization, and material results of selected primitive and contemporary cultures. (3F) Bee

140. Social Psychology II. Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: Soc. 40. (S) Bee

141. Rural Community Organization and Leadership. An analysis of the forces and procedures which are at work in developing community organization, with special emphasis on the techniques of training to help make the community more effective. (3S) Roskelley

152. Organized Crime. Criminal behavior is becoming more thoroughly organized. As such it has historical backgrounds and a natural history in the U.S. The organization, the fields most organized, and countering techniques are the concern of the course. Prerequisites: Soc. 52 and 170, or Instructor's approval. (3S) Symons

153. History of Social Thought. The emergence and development of social thought from early periods is traced to August Compte. From this point important developments in Europe and America are studied. Particular emphasis is given to the American field. For majors and minors in Sociology. Others on instructor's approval. (5S) Symons

156. 256. Social Institutions. Similarities and differences in the 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. (3W) Geddes

160. Family Relations. The social-emotional development of the child in the family, Material adjustment; social-cultural difference in family behavior; problems; ideological considerations Prerequisite: Soc. 60. (3S) Bee

161-281. Family Life Workshop. Designed primarily for students preparing to teach family relations. Practical materials are worked out for use in the classroom. Prerequisites: Soc. 60, 160. It is suggested that students take the three courses in sequence. (3S) Bee

170. Juvenile Delinquency. The causes of delinquency are considered with the purpose of arriving at intelligent remedies. Various methods of home, social, and institutional treatment are studied; parental cooperation, personal supervision allied with probation and parole, institutional treatment, etc. Prerequisite: Soc. 52. (3F) Symons

171. Poverty and Dependency. The extent of poverty, its causes, remedies now in use, and others which give promise. Social methods of caring for dependents are examined. Emphasis on programs which look to prevention and to minimization as well as to adequate care. (3F) T.B.A.

180. 181. 182. Current Sociological Problems. For upper division and graduate students. (1F. 1W. 1S) Staff

187. Research Methods in Sociology. An advanced course in Methods of Social Research. Prerequisite So. 87 or Math 111. (3W) Geddes

190. 191, 192. 193, 194, 195. Seminar in Sociology. Time arranged. Six quarters required for majors in Sociology. (1F. 1W. 1S) Staff

201. Research in Sociology. For advanced students only. A project is organized and field work is carried on under supervision. Original studies are made. Prerequisite: Soc. 70, 87 or Math. 111. (F. W or S) Staff

202. The Study of Society. The basic principles of sociology are considered in their historical, theoretical and scientific settings, as a body of facts, a method of investigation and an explanation of associative living. (3S) Symons

207. Graduate Seminar. Short subjects falling within the field of Sociology and pertinent to it but not available in regular courses are selected for study. (2W) Staff

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

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

301. Research Methods in Criminology. Careful study and analysis of problems, methods, techniques, and outlook involved in criminological research. (3S) Symons

Social Work
Division of Social Work

Joseph A. Geddes, Director; Don C. Carter, Assistant Director; Evelyn H. Lewis, Assistant Professor; Contributing—W. B. Preston, Professor; Joseph N. Symons, Lawrence S. Bee, R. Welling Koskelley, Evan B. Murray, Associate Professors.

SOCIAL WORK CERTIFICATE

The Social Work Certificate is conferred on students who have completed 45 credits of graduate professional courses in Social Work during 3 or more quarters of graduate residence.

Professional Social Work courses open to graduate students working for the Social Work Certificate are:
SCHOOL OF COMMERCE

S.W. 200 Principles of Social Case Work I ........................................ 3
S.W. 201 Principles of Social Case Work II ........................................ 3
S.W. 210 Field Work I ........................................................................... 4
S.W. 211 Field Work II ......................................................................... 4
S.W. 212 Field Work III ........................................................................ 2-4
S.W. 214 Field Work IV—Group Work .................................................... 2
S.W. 222 Social Work in Rural Communities ........................................... 2
S.W. 230 Social Psychiatry I .................................................................. 2
S.W. 231 Social Psychiatry II ................................................................. 2
S.W. 240 Community Organization ......................................................... 3
S.W. 250 Public Welfare Services ............................................................ 3
S.W. 260 Medical Information ................................................................. 3
S.W. 270 Child Welfare .......................................................................... 3
S.W. 272 Foster Home Care of Children ................................................... 3
S.W. 275 Principles of Group Work ........................................................... 3
S.W. 276 Contemporary Social Work Literature ...................................... 2
S.W. 251 Public Welfare Services II ......................................................... 3
S.W. 182-282 Children in Institutions ...................................................... 3
S.W. 187-287 Research Methods in Sociology and Social Work ............. 3
S.W. 295-296 Social Work Seminar ......................................................... 1-2

147. Social Security (For description, see Economics) ......................... Murray
162. Mental Hygiene. Social and cultural changes that have given rise to problems of adjustment. Reactions to stress; “preventive” growth and adaptation. (3S)

173. The Field of Social Work. A survey of contemporary social work as it is divided into the following areas of activity: social case work, social group work, community organization and social action. Study of objectives, processes and personnel requirements of social work agencies. (3F) Lewis

174. Introduction to Case Work. Introductory information dealing with theories and practices of social case work. (3W) Lewis

175. Introduction to Field Work. To acquaint the students with various agency organizations dealing with social work and related areas. Field trips will be arranged. (3S)

177. Social Treatment of Children’s Problems. An analysis of the child’s behavior as a symptomatic expression of his needs; the formulation of treatment plans in accordance with these needs. (3F) Carter

180. Introduction to Group Work. An introduction to the basic philosophy of social group work, and its application in group leadership. Consideration of the organization and methods of the principal agencies in the community. (3S) Carter


187-287. Methods of Social Research. Technique of defining the problems, developing schedules, interviewing and analyzing sources of material. Majors in Sociology and Social Work should take this course. (3W) Geddes

195. Social Work Seminar I. A study of social work publications and other source material applicable to the field. (1W) Staff

196. Social Work Seminar II. Discussion of laws and administrative practices pertinent to social work. (1S) 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 record keeping and development of skill in relationship. (3W) Lewis

210. Field Work I. Field work centers will be maintained in selected public and private agencies and supervision will be provided under college direction. S.W. 200 should precede or be taken concurrently. (2-4 F or W)

211. Field Work II. A continuation of Field Work I. (2-4 W or S)
212. Field Work III. A continuation of Field Work II. S.W. 200, 201 are prerequisites. (2S)

214. Field Work in Group Work. A limited amount of leadership training and observation of groups in action is available to students who have completed Social Work 275. (2S) Staff

222. Social Work in Rural Communities. Social work in relation to problems of organization, administration and community relations, particularly as they affect rural counties. (2S) Staff

230. Social Psychiatry I. Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; the interrelation of physical, emotional, mental and environment factors. (2F)

231. Social Psychiatry II. An advanced course open only to students of work who have had S.W. 230. (2W) Bee

240. Community Organization. Processes operating in rural and urban communities and development of means for coordinating them. (3W) Geddes

250. Public Welfare Services I. The development of the concept of public responsibility and its application in a modern public welfare services program; the historical development of the various public welfare services. (3) Carter

251. Public Welfare Services II. An analysis of the operation of a modern public welfare services program, including: public assistance, social security, public services for children, etc. (35) Carter

260. Medical Information. Diseases most frequently encountered in social work. The interrelations of disease and social conditions. Medical resources. Open to social work students in the senior year. (35) Preston

270. Child Welfare. Evolution and current developments in programs for meeting the 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 of the handicapped and the exceptional child. (3W)

273. Social Case Work with Children. A discussion of social case work with children in their own and in foster homes as practiced by family and child welfare agencies, schools, etc. Case materials used extensively. (35) (3S)


276. Contemporary Social Work Literature. Attempts to review current contributions to the various fields of social work literature as well as to acquaint the student with the character of the periodical literature that has been published during the previous year. (2W) Staff

285-286. Seminar in Social Work. For advanced students in the Division of Social Work. Current trends in social work are reviewed; particular emphasis upon review of recent literature. (1-2 S) Staff
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General Information

THE School of Education, as an administrative unit of the College comprises the departments of Art, Education (Administration), Education (Elementary), Education (Secondary), Education (Vocational), Library Science, Music, Physical Education and Recreation, and Psychology. A major function of these departments is the preparation of teachers for elementary and secondary schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments of the College.

The Bachelor of Science degree with a major in Education is designed for those who are preparing to teach in elementary and secondary schools. Professional training is provided for students majoring in other departments to meet requirements for teaching certificates. The total program of the students is under joint supervision of the major department and the division of Education. On a graduate level, provision is made for those who desire to meet requirements for administrative and supervisory credentials.

The School of Education stands firmly on the principle that teachers must not only be liberally educated but be thoroughly prepared in the subjects which they are to teach.

For teachers in junior and senior high schools it is intended that the student shall be prepared to teach in two high school teaching fields. The student's mastery of essential subject matter in the teaching field, rather than the credit hours, should operate in determining subject matter proficiency. Teaching fields should be chosen by the student on basis of his individual abilities and interests and also in the light of available information concerning the demands for beginning teachers and the supply in the respective fields. The curriculum in professional education and psychology aims to impart to prospective teachers the meaning of education in its relation to desirable social objectives, the organization and administration of schools in relation to the needs of the learner and to social aims, an understanding of the nature and needs of the learner and the learning process, and by means of certain technical courses in education, to develop skills in the art of teaching.

The sequence of professional courses in Psychology and Education is such that it is necessary to study in these fields before the final year. A detailed plan of study is not outlined or prescribed. The student who plans to prepare for teaching will usually find it advantageous to devote the first two years to securing a well-balanced general education, giving some attention to courses prerequisite to advanced study. During these years some emphasis may also be placed in the field of specialization. The third and fourth years should be devoted primarily to concentration in the major field of study and to professional subjects in Psychology and Education.

For requirements for admission, certification, and graduation, see pages ___ to ___.

TEACHER PLACEMENT SERVICE

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 expected and urged 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 during the winter quarter and early part of the spring quarter.

TEACHER CERTIFICATE

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements so far as regular students of the College are concerned.

The certification standards conform as nearly as may be 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:
SCHOOL OF EDUCATION

Teacher’s Certificate for Secondary Schools
Teacher’s Certificate for Elementary Schools
Teacher’s Certificate for Kindergarten
Librarian’s Certificate for Elementary Schools
Librarian’s Certificate for Secondary Schools
Two-year Counselor’s Certificate
Certificate for Secondary School Teachers of Vocational Agriculture
Two-year Certificate for Secondary School Teachers of Industrial Arts

Specific requirements for each certificate are listed with the departments in which the major work is offered.

TEACHER TRAINING

The College offers complete programs of teacher training in all phases of public school work. Facilities for practice teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Child Development in the School of Home Economics, is concerned particularly with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts, and Technology do their practice teaching under the direction of the departments concerned in selected schools throughout the state.

For the training of kindergarten and general elementary teachers the College maintains the Whittier School which includes the kindergarten and grades one to six inclusive. The teachers in the school, selected particularly for their fitness to serve on the teacher education program, are regular members of the College faculty. The training 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.

By special arrangement with the local board of education the facilities of the Logan Junior High School and Logan Senior High School are utilized as student teaching centers in secondary education. Each school has an enrollment of approximately 700 pupils. Thus both schools are able to offer a well balanced schedule of classes and a comprehensive program of student activities, all of which are available for cooperative use in teacher education. Arrangements are made for training in other schools as needed.

ART, FINE AND APPLIED

Floyd V. Cornaby, Professor and Head of Department; Calvin Fletcher, Professor Emeritus; H. Reuben Reynolds, Professor; Jessie Larsen, Associate Professor; Everett Thorpe, Assistant Professor; Warren Wilson, Instructor.

The Art Department is prepared to offer major and minor courses of study in the fields of Art Education, Commercial Art, Fashion Design and Illustration, Photography, Painting, Sculpture, Interior Decoration, and Crafts.

As a service unit to the entire college the Art Department is closely correlated with Home Economics, Industrial Arts, Recreation, Landscape Architecture and other major divisions of the college.

Students choosing to major or minor in any of the following fields of art must show aptitude for the work and complete courses listed below:

Art Education

Teaching majors in secondary education are required to complete Art 1, 2, 7, 10, 32, 106, 122, 123, 124, 125, 126, 127, 133, 151, 10 credits in painting and 10 credits in crafts.

Teaching majors in elementary grade supervision or special teaching of drawing, handwork or creative expression are required to complete Art 1, 2, 3, 10, 32, 104, 106, 122, 124, 125, 152, 8 credits in painting and 8 credits in crafts.

Teaching minors in art should take Art 1, 2, 3, 7, 10, 32, 104, 124 125, 151, 4 credits in painting, and 4 credits in crafts.

Clothing and Textile majors desiring a teaching minor in Art should complete Art 104, 111, 127, 135, 151, and 8 credits in crafts.
Elementary Education majors who elect Art as a specialization field should complete Art 1, 2, 3, 7, 10, 104, 124, 125, 4 credits in painting and 4 credits in crafts.

**Commercial Art**

Students who choose Commercial Art as a major are required to complete Art 1, 2, 3, 7, 10, 32, 35, 104, 108, 110, 117, 124, 128, 135, 140.

Minors in Commercial Art should take Art 1, 2, 3, 7, 10, 32, 35, 104, 110, 124, 135.

**Fashion Design and Illustration**

Majors are required to complete Art 1, 2, 3, 7, 10, 32, 35, 104, 109, 111, 117, 124, 135, 3 credits in 171, Clothing Textiles and Related Arts 24, 105, 115, 125, 140.

Minors are required to complete Art 1, 2, 3, 7, 10, 32, 35, 111, and Clothing Textiles and Related Arts 24, 105, 115, 125.

**Photography**

Students desiring a major in Photography through the Art Department are required to complete Art 1, 2, (3 or 26 or 33), 10, 32, 108, 109, 117, (7 or 128). Photography 61, 64, 65, 66, 67, Landscape Architecture 20.

Minors are required to complete Art 2, 32. Photography 61 and two of the following: 64, 65, 66, 67.

Refer to Photography in Industrial Arts for course descriptions.

**Painting**

Major requirements are Art 1, 2, 3, 7, 10, 32, 33, 106, 112, 118, 124, 125, 126, 127, 128, 140, 18 credits in oil painting and 6 credits in water color.

Minor requirements are Art 1, 2, 3, 7, 32, 33, 106, 124, 125, 126, 127, 128, 10 credits in oil painting, 4 credits in water color.

**Sculpture**

Major requirements are Art 1, 2, 3, 7, 10, 33, 106, 108, 112, 118, 124, 125, 126, 127, 128, 12 credits in 171.

Minor requirements are Art 1, 2, 3, 7, 106, 112, 118, 124, 125, 128, 6 credits in 171.

**Interior Decoration**

Majors are required to take Art 1, 2, 3, 7, 10, 32, 109, 111, 122, 123, 124, 128, 4 credits in 171, Landscape Architecture 160, Clothing Textiles and Related Arts 24, 33, 140 Household Administration 65.

Minors are required to take Art 1, 2, 3, 7, 111, 122, 124, 26, Landscape Architecture 20.

**Crafts**

Majors are required to complete Art 1, 2, 3, 4, 7, 10, 106, 111, 112, 113, 114, 118, 124, 125, 127, 128, Woodwork 61a, 10 credits in 171. Landscape Architecture 20.

Minors are required to complete Art 1, 2, 3, 4, 106, 111, 112, 113, 118.

**General Art**

Students desiring to major in General Art with no specializations or emphasis on teaching are required to complete Art 1, 2, 3, 4, 7, 10, 32, 104, 106, 104, 124, 125, 126, 127, 128, 132, 133, 10 credits in painting.

The following courses may be repeated for additional credit: Art 104, 106, 108, 109, 110, 111, 112, 113, 114, 117, 118, 130, 135, 171.

**ART COURSE DESCRIPTIONS**

**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 or S) Sections limited to 20 students.

2. **Design Creation and Application.** Problems in creating designs for application to specific projects. Instruction is adapted to the individual, satisfying the needs of teacher, homemaker, hobbyist, or scout, summer camp and recreational counselors. (3F, W or S) Prerequisite: Art 1.
7. Freehand Drawing. Objective drawing of natural forms from observation and memory in various media. A desirable prerequisite to all painting courses. (2F or S) Larson

104. Creative Expression. Studio experience in developing spontaneous expressions and freedom of graphic interpretation. Excellent for the layman who thinks that he cannot express himself artistically, but who has a desire to do so. For art majors who find it difficult to interpret their inner ideas. (2W) Larson

22-122. Essentials of Interior Decoration. A foundation course including the study of historic styles and the analysis of art elements and principles of design as applied to home planning and furnishing. Prerequisite: Art 1 and 2. (4F or W) Larson

23-123. Applied Interior Design. A study of the practical application of art elements and principles of design to problems of decoration and furnishing involved in producing homes of character, beauty, and livability. Prerequisite: Art 22-122. (4W or S) Larson

124. Perspective. The principles of cylindrical, parallel, oblique and modernistic perspective as used in the arts. Suited to the needs of students of art and landscape architecture. (3F or S) Fletcher

125. Anatomy. Artistic approach to the drawing of human and animal anatomy. (2S) Fletcher

127. Advanced Design. Special problems in creating designs for furniture, leather, art metal, jewelry, ceramics, textiles, plastics, and mural decoration. Adapted to the needs of teachers, industrial artists, craftsmen. (3W) Reynolds

128. Figure Drawing. The construction of the human figure. Adapted to the needs of fashion artists, illustrators, commercial artists, and teachers. (2W) Thorpe

45-145. Rendering Techniques. Pen and ink, pencil and related techniques. Designed to supply the needs of students in scientific drawing, landscape architecture and Commercial Illustration. (2S) Fletcher

Appreciation

3. Art Understanding and Appreciation. Aims to increase enjoyment of living through the sense of sight. Develops understanding of the basic principles underlying architecture, landscape gardening, interior decoration, sculpture, painting, ceramics and other visible forms of art in everyday life. (3F) Reynolds

26-126. History and Appreciation of Architecture. The characteristics of the great styles of building and the development of a taste for good architecture. Adapted to the needs of the homemaker, teacher, artist or layman. (3F) Reynolds

32-132. Color. Color as used in stage lighting, painting, design, and everyday life. Its physical, psychological and artistic phases are correlated. Suited to the businessman, layman, dramatists, artists, teacher and painter alike. (3S) Reynolds

33-133. History and Appreciation of Painting. Designed for the layman desiring to extend his knowledge of the great painters as well as for the teachers of art and artists. (3S) Reynolds

Crafts

111. Fabric Design and Application. Projects in creating designs of character and beauty and applying them to suitable textiles in techniques of block print, stencil, silk, screen, hooked rug, tie and dye batik. Prerequisites: Art 1 and 2. (2F or S) Larson

112. Ceramics. Art of making pottery, tiles, figurines, etc. (2F or S) Staff


114 Leathercraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (2F, W or S) Cornaby

118. Plastics. Creative use of plastics as an ornamental craft. (2W) Cornaby
10-110. Lettering-Layout. Design in advertising, display, layout, lettering, etc. (3F, W or S)  
35-135. Commercial Illustration. Fashion design and illustration, advertising. (3F, W or S)  
117. Commercial Portrait Painting. Drawing, illustrating and painting of portraits in various media. (2S)  

Photography  
51. General Photography .................................................................................. Allen  
61. Introductory Photography .......................................................................... Allen  
62. Industrial Photography ............................................................................... Allen  
63. Agricultural Photography ........................................................................... Allen  
64. Motion Picture ............................................................................................ Reynolds  
65. Portrait Photography ................................................................................... Allen  
66. Color Photography ...................................................................................... Reynolds  
67. Abstract Composition ................................................................................. Reynolds  
151. Photographic Problems ............................................................................. Staff  

Art Education  
34. Art for Young Children. Designed to meet the needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3F) Fletcher  
152. Art Methods for Elementary Grades. Methods of teaching drawing, painting, design and handicraft in the elementary schools. A "must" in preparation of a grade school teacher. Prerequisite: Art 1 and 2 or 4. (3S) Larson  
151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the 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 4. (3W) Staff  

Painting  
Fletcher  
Emphasis on Portrait and figure painting. (2W) Larsen  
Cornaby  

Sculpture  
6-106. Sculpture. Creative expression in a variety of plastic mediums, which will include wood, stone, plaster, clay and metals. This course emphasizes the esthetic employment of form and the technique necessary to casting, built up plaster modeling, beating metals, stone cutting, and wood carving. (3W) Staff  

Graphic Art  
140. Etching. A study of the unlimited possibilities for creative artistic expression through the use of the metal plate as a printing medium. Techniques and uses of the burin, dry-point, soft-ground, hard-ground, aqua-tint, and acid bath in achieving desired effects will be stressed. Staff  
171. Special Studio Courses. Individual work on specific problems. This is a service course to all departments. However, art majors desiring work in Art 171 are required to take Art 1 and Art 2 as prerequisites. All criticisms, assignments and supervision are given on Fridays at a time arranged between student and head of department. In some instances several instructors may be called in on the same project. From one to five credits a quarter may be taken.
SCHOOL OF EDUCATION

Cornaby: Art metal, jewelry, lapidary, precision casting, leathercraft, ornamental plastics, industrial design, watercolor.

Fletcher: Etching, wood engraving, monotype or lithographic drawing, scientific drawing, oil painting, watercolor, perspective, pen and ink illustration, architectural and landscape rendering, problems in art education for nursery, elementary and secondary grades.

Reynolds: Photography, puppetry, art appreciation, architecture, interior decoration, color, design.

Larson: Design, interior decoration, textiles, silk-screen processing, stenciling, block printing, weaving.

Thorpe: Commercial art, fashion drawing, illustration, portrait painting, design, advertising display, figure drawing, anatomical drawing.

Zufelt: Sculpture, modeling, ceramics.

Education (Administration)

E. A. Jacobsen, Chairman
E. A. Jacobsen, John C. Carlisle, L. H. Humpherys, Professors; L. G Noble, Associate Professor; Ben Van Shaar, Assistant Professor.

10. College and Life. Orientation course especially designed for freshman but open to all students. (2F, W or S) Chase

Education 11. Restricted to Honor Residents in the dormitories. Various aspects of guidance conducive to helping new students adjust to college life. 2 hours. Fall. I. Daniel

114. Organization and Administration. Fundamental principles of organization and administration of schools in the American public school system with emphasis on Utah conditions. (3F or W) T.B.A.

116. Articulation of the Educational Program. A survey of existing needs for close articulation of the various educational units and agencies. Discussion of the factors conditioning nature and extent of articulation and of the unifying principles upon which a well articulated education program rests. (3F or W) Jacobsen

141. Social Education. The implications for education involved in social conditions and social change. The social significance of current educational theories and practices. (3W) Noble

181. School Finance. A study of the importance of finances in a school system and the principles and practices involved in the collecting and distributing of school revenues, with special reference to the conditions in Utah. (2F) Jacobsen

190, 191, 192. Intercultural Education. A sequence of courses planned in cooperation with other departments on the campus to acquaint the prospective teacher with ways and means of studying in the elementary and secondary schools the culture of other peoples. (1F, 1W, 1S) Carlisle and Staff

201. Background of Modern Education. An integration of the history and philosophy of education as a basis for understanding modern education. The evolution of educational thought, the sources of great philosophies of education in relation to their times. (5F) T.B.A.

211. Educational Measurement and Statistics. The fundamental principles of measurement tests and test construction, statistical analysis, and evaluation procedures in education. (5W) Jacobsen

205. Reading and Conference. Provides for individually directed study in the fields of one's special interest and preparation. (1-2F, W or S) Staff

219. The Principal and His School. Practical problems confronting the principal in administration and supervision, in terms of the changing social scene and changing concepts of school administration. Problems of administration, supervision, curriculum, pupil personnel, school-community relations, as they apply to the work of the principal all are given consideration. (3W) Carlisle
221. **School Administration.** A general study of 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 discussed. (3W) **Jacobsen**

222. **Administration of School Personnel.** A study of principles and practices in the management of teacher and pupil personnel. (3S) **Jacobsen**

230. **School Supervision.** The principles and practices of school supervision including the qualifications and responsibilities of the supervisor. (3S) **Carlisle**

237, 238, 239. **Educational Seminar.** Gives opportunity for the 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. (2W) **Carlisle**

271. **Research and Thesis Writing.** Provides for individual work in thesis writing with the necessary guidance and criticism. (F, W or S) **Staff**

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**Education (Elementary)**

-Chairman

Edith Shaw, Assistant Professor; Ellen Humphrey, Fern Nicholes, Myrtle Jensen, LaRue Parkinson, Alice Chase, Nadine Baster, Hazel C. Clark, Instructors.

In connection with the general requirements for the Bachelor of Science degree, the following requirements must be met:

1. Courses designed to provide a broad liberal background. These must include ten credits in each of the four basic fields of knowledge: social sciences, biological sciences, physical sciences and mathematics, and language arts; and six credits in fine and practical arts.

2. Thirty credits in one field of concentration or 18 credits in each of two such fields.

3. A major of 45 credits in professional study selected from the following divisions:


   **Group II.** Understanding the School—Minimum 6 Credits: Education 103, 114, 116, 141, 201.

   **Group III.** Curriculum and Methods—Minimum 12 credits: Education 104, 105, 107, 108, 161, Psychology 112, 107, English 24, Speech 18, 158, Music 130, Art 152, Physical Education 177, 182, Child Development 175A.

   **Group IV.** Student Teaching—Minimum 12 credits: Education 106, Child Development 175b.

   **Group V.** Electives—may apply on 45-credit major: Psychology 120, 140, 102b, Education 110, 145, 165, 181, 194, 203, 205, 211, 219, 221, 237-8-9.

Selection of the program of study should be under the guidance of the major professor. Completion of a major in Elementary Education includes all requirements for a Utah general elementary certificate.

103. **Principles of Elementary Education.** Aims, functions, work and attainable goals of the elementary school as an integral part of the American system of education; its relations with the community and the other schools of the American series. Part of the work of the course will be devoted to observation and analysis of practices and procedures in selected elementary schools within the vicinity of the College. Two hours of observation weekly. Time arranged. (4F or S) **T.B.A.**
104. Elementary School Curriculum. Designed to familiarize prospective elementary teachers with the content of the elementary curriculum, the objectives and standards to be realized in the grades, and to extend the student's scholarship in the various fields explored by pupils of the elementary school. (3F or W) T.B.A.

105. Principles of Teaching in Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. The purpose and meaning of subject matter in light of the foregoing thesis. Significance of the fact of individual differences in its application to school room practices. Consideration of schoolroom equipment and of organization and play activity. (5F, W or S) Shaw

106. Student Teaching in Elementary Schools. For juniors or seniors who have had Educational Psychology and Principles of Education. The apprentice plan is followed which requires an initial period of observation with minor study must be distributed approximately as

107. The Teaching of Reading. Objectives, standard of attainment and methods of reading instruction; diagnostic and remedial techniques at the elementary and secondary level; reading in the activity program. (3W) T.B.A.

108. Social Studies in the Public School. Social responsibilities and opportunities of children and youth in the present and postwar world. The part that should be played by the school and the teacher in helping boys and girls to meet these problems is studied. This will deal with both content and methods in social studies for the public schools. (3F) T.B.A.

109. Teaching of Science. Materials and methods most suitable to the attainment of the objectives of science teaching on elementary and secondary school levels. (3S)

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. (2S) Jacobsen

145. Safety Education. Emphasizes (a) the needs for safety education in the modern world; (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 and directed by safety specialists from many areas. (2F or S) T.B.A.

203. Evaluating the Elementary School. Studies evaluating the changing elementary school are analyzed. Particular attention is given to organization and curriculum. Newer methods utilized in evaluation are considered. Enrollment open only to experienced teachers or prospective teachers who have completed their courses in student teaching. (3W) Carlisle

Education (Secondary)

John C. Carlisle, Chairman
John C. Carlisle, L. R. Humphreys, Professors; L. G. Noble, Associate Professor; Helen Cawley, J. K. Vanderhoff, Assistant Professors; Pearl S. Budge, Instructor.

For a major in Secondary Education the student must complete at least 40 credits of professional work in Education and Psychology. The major field of study must be distributed approximately as follows:

(1) Nine credits in the field of understanding the pupil: Psychology 102; Education 113; Public Health 155; Psychology 105, 123, 140, 145, 181, 182, 183, 202, 285 or Physical Education 84 or 192.

(2) Six credits in the field of understanding the school: Education 111, 114, 115, 201, 141.
(3) Fifteen credits in student teaching, methods and curriculum: Education 111, 127, 129, 130, 107, 108, 115, 161, 194; Art 151; English 123; Speech 123; Secretarial Science 179 or 180; Music 121, 122 or 123; Physical Education 20, 130, 160, 163.

Note: Courses in group (3) above other than Education may be elected only by students with teaching majors in the specific fields indicated.

A teaching major of not less than 30 credits, of which 15 credits must be Upper Division, and a teaching minor of 18 credits in subjects taught in high schools are required of majors in secondary education. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not less than 30 credits in two or more related subjects with a minimum of 18 credits in any field included in the composite major. At least one-half of the work must be of Upper Division grade. Composite majors are offered in the following fields: Social Science, Language Arts, Physical Science and Mathematics, Biological Science, Commercial Education.

Selection of a program of study should be under the guidance of the major professor. Completion of a major in Secondary Education includes all requirements for nearby states. Students wishing to prepare for teaching in any of these states should consult the office for information.

111. Principles of Secondary Education. The background and present status of the secondary school in the United States. Problems of objectives, curriculum, methods, and pupil personnel are considered. (3F. 3W. 3S) Carlisle

115. Secondary School Curriculum. The nature and function of the curriculum. Different viewpoints respecting the curriculum, and examples of new type curriculum now attracting attention in various parts of this country are examined and evaluated. (3S) McClellan

123. The Teaching of English. A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. (3F) Hayward

123. Teaching of Speech. The methods and problems peculiar to the teaching of Speech. The organization of courses and lesson plans is included. Students may register only with permission of instructor. (2F) Myers

127. Secondary School Methods. General methods of teaching in the secondary school. Such matters as teacher personality, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, testing and evaluation, all are included. It is recommended that the course be taken the quarter immediately preceding enrollment for student teaching, Education 129 and 130. (2F. 2W. 2S) Carlisle

129. Student Teaching in the Secondary School. Required for certification. Students may be enrolled only after completing Psychology 102, Education 111 and Education 127 and at least 18 credits in the field in which they expect to do student teaching. Education 127 may be taken during the same quarter by special approval of the instructor. It is recommended that Education 130 also be taken the same quarter, in which case at least two periods per day are required (one for each course), in addition to one hour per week, 4 to 5 o'clock for group discussions. The student is assigned to a sponsor teacher in the secondary school. A brief period of observation is followed by gradually increasing responsibilities until upon completion of the two courses, the student has had guided experiences in all professional responsibilities of the typical faculty member in the junior or senior high school. (SF. 5W. 5S) Carlisle, Budge, Vanderhoff

130. Student Teaching in the Secondary School. A continuation of Education 129, which must precede it or be taken concurrently. (SF. 5W. 5S) Carlisle, Budge, Vanderhoff

150. Teaching of Mathematics. The objectives in the teaching of mathematics on the elementary and secondary school levels, and materials and methods most conducive to the attainment of these objectives. (3) Tingey

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts.
Arrangement of the shop, studio, selection of tools, and supplies. Required of all majors and minors in art on this level. Prerequisites: Art 1, 2. Staff

161. Audio-Visual Aids in Education. Emphasizes the importance of audiovisual aids in the school program. Building a workable program in which are utilized the newest materials and techniques. (3F) Noble

179. Methods of Teaching Typewriting. Recent development and practices in the teaching of typewriting. The analysis of objectives, laws of learning, organization of materials, texts, standards of achievement; methods of acquiring speed and accuracy are considered. For those preparing to teach typewriting and those engaged in teaching who wish to render their teaching more effective. (3F) Neuberger

180. The Teaching of Shorthand. Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. (Consult instructor before registering.) (3F) West

237. Problems in Secondary Education. For graduate students in secondary education and those preparing for school administration or supervision at the junior-senior high school levels. Deals with a review of research in the field together with emphasis upon areas of particular concern to members in the class. (3W) Carlisle

Three credits earned in methods courses in any of the preceding fields may be counted toward certification by majors in these fields.

Education (Vocational)

L. R. Humpherys, Chairman
Helen Cawley, Assistant Professor

Candidates for a teacher's certificate in the several fields of Vocational Education need to comply with the Utah Certification requirements. The following courses are suggested:

Agriculture Basic: Psychology 102, Education 112, 113, 114, 125, 126; Bacteriology 155: Elective, 3 credits.

Home Economics Basic: Psychology 102; Education 114, 120, 121, 122; Bacteriology 155; Elective, 7 credits.


113. Vocational Guidance. Individual and occupational differences; available tests, measurements, and other devices for determining individual difference; individual and group counseling; and organization of guidance service. Prerequisite: Psych. 102. (3F, W or S) Humpherys, Carlisle

120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; an appreciation of methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102. (3F or S) Cawley

121. Problems in Teaching Home Economics. Recent investigations in Home Economics and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122 and with one other three-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. (4W or S) Cawley

122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with 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 other arrangements for her student teaching. In the latter
case, the student teacher teaches at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W) Cawley

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. In Spring the student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4S) Humpherys

Field Trip. For senior girls and graduate students enrolled in homemaking education. Trip planned cooperatively by students and homemaking education staff. Trip will probably take place during Spring Quarter, and the estimated cost will be given in advance.

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. (3S) Humpherys

125. Methods of Teaching Agriculture. For teachers of vocational agriculture. Fundamental principles and practices of teaching, selection, and organization of subject matter and supervision of agricultural activities on the farm. (5W) Humpherys

126. Directed Teaching in Agriculture. Student observation and teaching in approved local vocational agricultural departments under supervision. Trainees are expected to leave the campus to train in selected high schools of the state for a full teaching program. (4-8 W or S) Humpherys

198. Special Problems in Home Economics Education. Developed around individual needs of students which are not otherwise provided for in curriculum. (1-2 F, W or S) Humpherys

200. Research for Master's Thesis. Credit arranged. Cawley

225. Special Problems in Agricultural Education. A consideration of needs of individual students and special types of service. (1-2S) Humpherys

226. Organization of Adult Instruction. The fundamental concepts in the organization and instruction of adults, principles and techniques of teaching adult classes. (3S) Humpherys


Graduate Work

Graduate study in the Department of Education leads to the Master of Science degree in Education or to the Five Year Diploma. All courses listed in the department are applicable to either the degree or the diploma with the exception of the following: Ed. 103, 104, 105, 106, 114, 129, 130.

Library Science

King Hendricks, Chairman

Library Science may be used as a teaching major or minor in connection with a major in Education. This course prepares the student for a librarian certificate as issued by Utah State Board of Education and for a position as school librarian on the elementary or secondary level. It also provides background for advanced training in librarianship. A teaching major of not less than 30 credits or a minor of not less than 18 credits must represent credits selected from each of three groups of courses including courses marked *.

Group 1: Technical processes 113, 120*, Eng. 111; Educ. 161; Art 110.

Group 2: Use of the Library 100*, 155*, 160; Eng. 24, 40, 52, 60; Speech 18; Educ. 107.

Group 3: Administration 150*; Educ. 104, 105; Psychology 110.

100. Reference Materials and Bibliography. Principal reference tools in each field are studied. Reference materials for school, public, and college libraries are included. (3W) Smith
106. Bibliographic Research in Agriculture. A study of the journals and technical reference materials, including use of indexes, bibliographies, abstracts, and technical journals. (1F or W) Logan


120. First Quarter Cataloging and Classification. Classification of books according to the Dewey decimal system and cataloging instruction adapted primarily to the use of school and public libraries. (3F) Smith

121. Second Quarter Cataloging and Classification. A continuation of the work undertaken in Library Science 102 which is a prerequisite to this course. Staff

150. School Library Administration. The theory of school library work with emphasis on demonstration and practical application. (3S) Carter


160. The Art of the Book. The history of bookmaking and printing. (1) Staff

Music

N. Woodruff Christiansen, Professor, Chairman, Instrument Division; Walter Welti, Professor, Chairman, Vocal Division; Roy Harris, Professor, Chairman, Theory, Composition and History; Johanna Harris, Associate Professor, Chairman, Piano; George Pahlz, Instructor.

MUSIC MAJORS. Music majors may specialize in vocal music, instrumental music, theory and composition, or piano. The following courses are required in all four fields: Basic Music I, 15 credits; Basic Music II, 12 credits; Piano, 4½ credits; Courses in Applied Voice, 4½ credits Score Reading, 3 credits (Instrumental and theory majors). Each music major will present or participate in a public recital or take a major role in an opera.

Major students will, in addition, complete courses in field selected as shown below:

VOCAL MUSIC. Band and Orchestra Methods, 6 credits; School Music Methods, 6 credits; Chorus, three quarters; Music History, 3 credits; Conducting, 3 credits; a course in the pronunciation of German, French and Italian; and the ability to play third grade piano music at sight.

INSTRUMENTAL MUSIC. Six quarters of band and three of orchestra or three quarters of band and six of orchestra; Band and Orchestra Methods, 9 credits; Music 80, 81, 87 (choice of two); Music 114; three quarters or equivalent of private instruction on instruments recommended by the major professor.

THEORY AND COMPOSITION. Basic Music I, II, III; Senior Theory: three quarters of chorus; six quarters of piano. Piano must be taken in Freshman and Sophomore years. Chorus may be in chorus or choral methods or in sight reading.

PIANO. Twelve quarters of piano (24 credit hours); six quarters of choral music or three quarters of choral music and three quarters of band or orchestra; must give recital before graduation.

1. The Art of Listening. Designed to enhance the general listener's appreciation of music through the use of selected reproductions; through non-technical, collateral reading and reports will be assigned. (3F) Welti

3. 4. 5. Sight Singing and Dictation. Notation, scales, intervals and keys in major and minor modes, and their applied use in reading music. (3F, 3W, 3S) Welti

15, 16, 17 or 115, 116, 117. String Ensemble. Composed of capable string players performing as a group. Music specially arranged for a large string group will be used. (1½F, 1½W, 1½S)

18, 19, 20 or 118, 119, 120. Symphony Orchestra. Provides training and practical experience in a wide range of orchestral works including symphonies and the annual opera score. Students below junior standing register for 18, 19, 20. (1½F, 1½W, 1½S) Christiansen
24. 25. 26 or 124. 125. 126. Chorus. Open to all students with a normal singing voice. Auditions to determine the part you sing are announced at rehearsal. Ladies meet Tuesday, Thursday and Friday. Men meet Monday, Wednesday and Friday. Auditions before registering are required in Winter quarter only. (1F. 2W. 1S)

27. 28. 29. Opera Production. A practical study of the details involved in the production of opera. Students enrolled become members of the production staff and are assigned specific or one year of lower division (3F. 3W. 3S)

30. 31. 32 or 130. 131. 132. School Music Methods. One year of Basic Music, or one year of Sight Singing must be completed before any student is allowed upper division credit. Fall quarter is given to methods in nursery school and lower grades; Winter quarter to upper grades; Spring quarter to high school. (3F. 3W. 3S)

35. 36. 37. Small Ensembles. Offers an opportunity for good voices to organize into trios, quartets, and other small units. See instructor before registering. (1F. 1W. 1S)

41. 42. 43 or 141. 142. 143. Band. This organization is the college concert band. Concerts will be given and music furnished for athletic events. Students below junior standing register for 41, 42, 43. Students able to attend only three rehearsals per week should register for one credit only. (1-2F. 1-2W. 1-2S)

44. 45. 46. Brass and Reed Groups. Brass quartets, sextets and woodwind quartets or quintets. Members will be selected from applicants. (1/2F. 1/2W. 1/2S)

69. 70. 71 or 169. 170. 171. Piano Master Class. Study of the techniques and literature of applied music. Includes accompanying and sight reading practice. Students are expected to perform in class. (11/2F. 11/2W. 11/2S)

77. 75. 76. Basis Music I. The study of melody (pitch design and rhythm design). Includes ear training, dictation, sight singing, composition and historical survey of melodic material. (5F. 5W. 5S)

80. Opera Appreciation. An intensive study is made of the world's best operas. Particular attention is given to the development of the orchestra as an essential part of the opera. By means of recordings the choicest musical sections are learned. (2F. 2S)

81. Symphony Appreciation. Complete symphonies are given by the use of recordings. A careful study is made of their form and content. Biographical sketches of composers. (2W)

84. 85. 86 or 184. 185. 186. String Groups. Offers opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Standard literature is studied. (11/2F. 11/21W. 11/2-1S)

87. Musical Literature for String Instruments. A non-technical course. Through recordings a study is made of standard concertos, trios, quartets, and quintets. Biographical sketches of composers and performers. (2F. 2W. 2S)

93. 94. 95. Symphony Orchestra—Sectional Training. Provides training in phrasing, counting, and sight-reading symphonic works. (a) string section, (b) woodwind section, (c) brass section. (1/2F. 1/2W. 1/2S)

101, 102. 103. Band and Orchestra Instruments. An individual study of assigned instruments with performance examinations. Required of all instrumental majors. Prerequisite, Music 121, 122, 123. (2F. 2W. 2S)

106. History of Music. The development of music from its varied inceptions to the present. Lives of the most prominent composers. Effects of history on the development of music. (3S)

114. Techniques of Conducting. The art and technique of effectively selecting, organizing and conducting group music. Style in expression. Use of the baton. Not open to freshmen. (3S)
121, 122, 123. Band and Orchestra Methods. A study of the various instruments and the essential points in the teaching of them. Designed for students who may teach bands or orchestras or for general musical background. To precede student teaching. Fall, brass and percussion instruments; Winter, woodwind instruments; Spring, string instruments. (3F, 3W, 3S) Christiansen

127, 128, 129. Opera Staging. Open only to the opera cast and their under-studies. Selections are made in the fall through competitive tryouts open to all students. Intensive study and rehearsing begins immediately after these selections are completed. (3W) Welti

135, 136, 137. Vocal Ensemble. Open only to members of the small choruses. Membership in these choruses is limited and competitive. Application may be made at any time, but auditions are announced only as vacancies occur. A good voice, and ability to read music are required. (1F, 1W, 1S) Welti

173, 174, 175. Score Reading. A course designed for all who expect to direct instrumental music, concentrating on the technique of reading scores. Practical application with performing groups. Recommended prerequisite: Musical 114. (1F, 1W, 1S) Christiansen

190, 191, 192. Basic Music III. Prerequisite: Basic I and II or equivalent. The study of the rudiments of counterpoint, including canon; ear training, sight reading, composition and historical survey. (3F, 3W, 3S) R. Harris

193, 194, 195. Senior Theory. Prerequisite: Basic I, II, III or equivalent. The study of melody, harmony, counterpoint in relation to form and orchestration. Three hours home work for each hour in class. (2F, 2W, 2S) R. Harris

201, 202, 203. Post Graduate Theory. The study of the theory and practice of the art of music in more advanced methods and forms. (6F, 6W, 6S) R. Harris

204, 205, 206. Post Graduate Music Composition. Guidance in practice of composition. (6F, 6W, 6S) R. Harris

Private Instruction Courses

N. Woodruff Christiansen, violin, band and orchestra instruments; Walter Welti, piano; George Pahtz, cello; Johana Harris, piano; Roy Harris, composition.

INSTRUCTORS: Lucy L. Christiansen, piano; S. E. Clark, piano and organ; Thelma Lundquist, piano; Mischa Poznanski, violin; Jean C. Thatcher, piano; Patience Thatcher, vocal; Eldon Torbensen, brass instruments; Jeanne T. Welti, piano.

ASSISTANT INSTRUCTORS: Maxine Greenwood, vocal; John Hughes, clarinet and saxophone; Eleanor Smith, piano.

The following courses are given through private study only. Appointments must be arranged with the instructor whom you select. For fees see page 57.

NOTE: Students taking one lesson a week in any private music study, and getting the required amount of practice and preparation, shall register for one and one-half credits per quarter. Students taking two lessons and getting the required amount of practice and preparation shall register for three credits per quarter. Upper division credit will be given students of junior standing provided they have had at least two years, or equivalent, of previous study.


*Students studying piano under Johana Harris are required to take the Piano Master Class.
Physical Education and Recreation

H. B. Hunsaker, W. B. Preston. Professors; Elizabeth Dutton, Associate Professor; J. K. Vanderhoff, Israel Heaton, Mary E. Whitney, Dale O. Nelson. Assistant Professors; Shirley Jenson, Lois Downs, Vaughn Gordon. Instructors.

INTERCOLLEGIATE ATHLETIC STAFF

Joseph E. Whitesides, Assistant Professor, Director of Athletics; George Melnikovitch, Howard B. Linford, Paul Marston, Assistant Professors; Marvin T. Bell, George Nelson, Instructors.

SERVICE COURSES

In the service courses of this department, an opportunity is given each student to perfect skills in some form of physical activity which will help establish a permanent interest in healthful recreation of the active as well as passive type, the promotion of physical fitness, the building of moral and the maintenance of health.

A physical examination is given to all students at the beginning of each year in order to advise them properly as to the type of activity best suited to their individual needs.

Women students are required to take physical education service courses for six quarters. Classes may be selected by the student; and the same numbered courses may not again be taken for credit. Before a student may enter an intermediate or advanced course, in any activity in which she has completed and received credit for the elementary course, minimum service course requirements must have been satisfactorily completed.

It is recommended that all male students take some activity course in Physical Education. A wide range of courses in aquatics, dual, team, individual and outing activities are offered each quarter. Credit in physical education counts toward a college degree.

INTRAMURAL SPORTS

Intramural sports are conducted as a part of the program of the Department of Physical Education and Recreation. The Women's Athletic Association, in cooperation with the women's division of the department, sponsors and offers a wide and varied program of activities. All women students are eligible and encouraged to participate in any or all of the sixteen sports offered during the year. Women's intramurals strive to provide "a sport for every girl and a girl for every sport."

The department carries on an extensive organized Intramural sports program for men. Competition in 12 to 16 sports is carried on in four separate leagues, fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues.

The function of the intramural program is to give every student moral, social, physical, and educational values derived from competitive athletics. The program of athletics provides for both individual and team endeavor, "athletics for all," which is the purpose of intramural sports.

RECREATION

The Department of Physical Education and Recreation aims to meet the recreational needs and interests of every student, whether he is being trained in agriculture, engineering, business, or other professional fields. This department will try to prepare the future farmer, banker, teacher or doctor for wise use of his leisure time. After courses in this department, students should be so interested in recreation that they will be valuable aid to any community.

Awards will be given to managers of various recreational groups and individual awards for special achievement. There will be groups organized in hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and social dancing.
PROFESSIONAL COURSES IN HEALTH, PHYSICAL EDUCATION, RECREATION, AND DANCE

The Department of Physical Education and Recreation is prepared to offer major study with specialization in the following fields: physical education, dance, elementary school physical education, secondary school physical education, recreation and health. It is recommended that in many study programs it would be desirable that a composite study program involving two of the above programs be selected to meet the major, minor requirements. In such cases, approximately 35 hours should be selected in each division.

The physical education and recreation department is closely correlated with various other major divisions of the college, as well as the school of education in training its majors.

Study Leading to the B.S. Degree

Majors in the Department of Physical Education and Recreation will fulfill the basic physical education requirement by completing the fundamental sports courses, P.E. 20, 21, 22, 30, 31, 32, or 94, 95, 96, 97, 98, 99 in lieu of the 6 credits required for graduation.

Teaching majors in elementary schools must complete P.E. 24, 25, 26, 81, 84, 85 or 92, 104, 181, 182, 183, 191. Six credits in Sports Techniques and 11 credits from the following: Physical Education 55, 86, 87, 150, 184, 192, 130 and 165.

Teaching majors in elementary schools must complete P.E. 24, 25, 26, 81, 92, 106, 180 or 181, 183, 184, 191, 192; and 12 credits in sports techniques. In addition, men complete P.E. 3, 55, 86 or 87. Women complete P.E. 81, 92, 150.

Note: 192 and 2 hours of special techniques are counted in certification requirements.

Teaching majors in dance must complete P.E. 81, 84, 24, 25, 26, 77, 78, 79, 83, 72, 76, 150, 153, 111, 113, 106, 180, 151, 102, 103, 104, 140, Textiles 105, Speech 20 or 120, 121 and 150A.

To meet the needs of the secondary schools a composite major of dance and physical education is highly desirable with the following: P.E. 24, 25, 26, 72 or 76, 77, 78, 79, 81, 83, 102, 103, 104, 111, 150, Speech 20.

Majors in recreation must complete P.E. 3, 25, 83, 84, 85, 153, 157, 179, 183, 196, 192; 6 credits from the following, Soc. 10, 52, 141, 170; and 6 credits in sports techniques and 12 credits elected from crafts, music, dramatics, and photography.

Teaching majors in health education must complete 36 credits selected from the following: Bac. 50, 160, 166; P.H. 144, 151, 155, 168, 201; Zoo. 111, 112, 116; P.E. 55, 84, 191, 184; Vital statistics and field training in health education.

To meet the needs of the secondary schools a composite major of health and some other closely allied subject is highly desirable.

Master of Science Degree in Physical Education

The Department of Physical Education and Recreation offers work 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 Bachelors Degree in physical education at Utah State Agricultural College and additional requirements as required 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, from which graduate courses will be selected. Suggested areas and courses are:

- Education 201, 211, 219, 221, 230, 237.
- Health 160, 166, Bac. 144, 151, 168, 201.
- Psychology 107, 110, 120, 140.
INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics, inspired by the highest ideals and conducted on a high plane, provide an excellent course in training for citizenship and the preparation to wrestle with life's problems.

In high schools and college competitive athletics become a great factor for student body consciousness and oneness and an outlet for great enthusiasm born of loyalty. They pay dividends in good health, physical development and such manly qualities as courage, self-control and the spirit of cooperation.

Every student at the college is given an opportunity to try-out for the various teams. Attractive schedules with teams representing other colleges are arranged in football, track and field, swimming, wrestling, tennis, golf and skiing.

The College has an attractive Stadium where the games are played, and the Field House seats 4,500 people for basketball contests. It also provides practice areas for other teams.

A splendid spirit of cooperation exists between the Intercollegiate Athletic Department and the Department of Physical Education and Recreation, proper.

COLLEGE HEALTH SERVICE

The Health Service is maintained primarily for the care of students who may become ill during their stay on the campus. This service is also looked upon as an educational department to teach preventive medicine and hygiene. Through consultations, examinations and advice it attempts to point out the causes of ill health, and to present clearly the fundamental laws of good health.

SERVICE COURSES FOR MEN

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<td>(IF) Melinkovich</td>
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<td>4. Boxing</td>
<td>(IF, 1W, 1S) Staff and G. Nelson</td>
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<tr>
<td>5. Boxing</td>
<td>(Advanced) (IF, 1W, 1S) Staff and G. Nelson</td>
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<td>7. Wrestling</td>
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<td>8. Wrestling</td>
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<td>12. Track</td>
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<td>14. Handball</td>
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<tr>
<td>23. Basketball</td>
<td>(1W, 1S)</td>
</tr>
</tbody>
</table>

26. 27. 28. Restricted Gymnastics. For students physically unable to take required physical education. Students may register only after consultation with head of department. (IF, 1W, 1S) Staff

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. Sigma Delta Psi</td>
<td>(1S) Heaton</td>
</tr>
<tr>
<td>34. Soccer</td>
<td>(1F) D. Nelson</td>
</tr>
<tr>
<td>35. VolleyBall</td>
<td>(1W) Heaton</td>
</tr>
<tr>
<td>37. Tumbling</td>
<td>(IF, 1W, 1S)</td>
</tr>
<tr>
<td>38. Tumbling</td>
<td>(1F, 1W, 1S)</td>
</tr>
</tbody>
</table>

SERVICE COURSES FOR WOMEN

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td>39. Soccer-Speed Ball</td>
<td>(1F) Jenson</td>
</tr>
<tr>
<td>40. Volleyball</td>
<td>(1F, 1W) Dutton</td>
</tr>
<tr>
<td>41. Basketball</td>
<td>(1F, 1W) Whitney</td>
</tr>
<tr>
<td>42. Softball</td>
<td>(1S) Jenson</td>
</tr>
<tr>
<td>43. Field Hockey</td>
<td>(1S) Dutton</td>
</tr>
<tr>
<td>44. Tumbling and Stunts</td>
<td>(1W, 1S) Dutton</td>
</tr>
</tbody>
</table>
45. 46. 47. Restricted Activities. For students physically unable to take the required work in physical education. Students may register only after consultation with head of department. (1F. 1W. 1S) Jensen


49. Modern Dance (Intermediate). Further practice in technique involving greater control and experimentation in the possibilities of movement. Student directed studies in elementary composition. (1W. 1S) Whitney

52. Swimming. (Elementary) (1F. 1W. 1S)
58. Swimming. (Intermediate) Prerequisites: P.E. 51 or satisfactory completion of elementary minimum service course requirements. (1F, W or S) Dutton Staff

55. Rifle. (1F. 1S)
59. R.O.T.C. Sponsor. (1W)

60. Body Conditioning and Physical Fitness. Theory and practice of body conditioning. (1F. 1W. 1S) Whitney

141. Modern Dance. (Advanced) Prerequisites: P. E. 48, 49 and consent of instructor. Further practice and development in techniques and composition of modern dance. (1W. 1S) Whitney

SERVICE COURSES FOR MEN AND WOMEN

1. Hiking. (1F. 1S)
3. Winter Sports. (1W)
9. Fencing (Elementary). (1F. 1W. 1S)
53. Fly Tying (1W. 1S)
54. Casting (1W. 1S)
61. Archery. (1F. 1W. 1S)
65. Badminton. (1F. 1W. 1S)
67. Tennis (Elementary) (1S)
68. Folk Dance. (1F. 1W)
70. Tap Dancing. (1F. 1W. 1S)
72. Social Dancing. (1F. 1W)
73. Golf. (1S)
74. Life Saving. Prerequisites: Ability to swim and permission of the instructor. Proper American Red Cross Certification is given those students who pass the examination. (1W)

90. Tennis. (Intermediate) (1S)
116. Swimmers (1F. 1W. 1S)
136. Golf. (Advanced) (1S)
155. Diving. Prerequisite: Swimming. (1S)
161. Archery. (Advanced) Prerequisite: 61. (1W. 1S)
166. Badminton. (Advanced) Prerequisite: P.E. 66. (1F. 1W. 1S)
167. Tennis. (Advanced) Prerequisite: P.E. 67. (1S)
168. Square Dancing. (1F. 1W. 1S)

THEORY AND PROFESSIONAL COURSES


20. 21. 22. Fundamental of Sports. A freshman laboratory course for men Physical education majors. These courses are prerequisites for P.E. 120, 121, 122. (1F. 1W. 1S) Not taught 1949-50. Heaton

24. 25. 26. Dance Laboratory. For teaching folk, square and tap to freshman and sophomore women majoring or minoring in physical education or dance. The material presented from a survey standpoint. (1F. 1W. 1S) Not offered in 1949-50. Whitney
30, 31, 32. Fundamentals of Sports. A sophomore laboratory course for men in physical education majors. These courses are prerequisites for P.E. 130, 131, 132, and are a continuation of the freshman class. (1F, 1W, 1S) Heaton

43. Recreational Crafts. See Industrial Arts 43.

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

75. Backgrounds of Physical Education. Designed to acquaint the student of physical education with the background, growth and trends in physical education. Physical education's role in the developments and adjustments of the individual and the qualification, responsibilities and training are given consideration. (3F) Downs

77, 78, 79. Dance Laboratory. For teaching the techniques of beginning, intermediate and advanced modern dance to freshman and sophomore majors in physical education or dance. (1F, 1W, 1S) Whitney

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

83. Playground and Community Recreation Leadership. Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (4S) Heaton

84. Normal Growth and Development. Traces the individual through the various stages of growth and development with special emphasis on principles and function of play. (3S) D. Nelson

85. Organization of Intramural Sports. Organization and administration of the intramural sports program for secondary schools. Sports, tournaments, units of competition, scoring systems and the coordination of intramural sports with physical education and athletics are considered. (3W) Hunacker

86. 87. Sports Officiating. Knowledge of rules, mechanics of officiating, proper instructions to other game officials such as timers and scorers, and game administration. (2F, 2W) M. Boll

92. Organization of Intramural Programs for Women. Organization of sports days, play days, tournaments and the administration of intramural activities for women. (2W) Jenson

94. 95. 96. Physical Education Laboratory. For teaching team sports fundamentals to freshman and sophomore women majoring or minoring in physical education. (1F, 1W, 1S) Downs

97, 98, 99. Physical Education Laboratory. For teaching individual sport and dance fundamentals to freshman and sophomore women majoring or minoring in physical education. (1F, 1W, 1S) Not offered in 1949-50. Jenson

102. Dance Composition. Composition based upon the special elements of direction, level, and dimension. Experience in composing for an individual and for group. (2F) Whitney

103. Dance Composition. Composition based upon musical form. The following forms are covered: AB, Rondo, Theme and Variation, Canon and Round, Dance Suite. (2W) Whitney

104. Dance Production. Composition done independently and participation in a performance required: lighting, staging, costume and make-up applied to a dance concert. (2S) Whitney


111. Creative Rhythms for Schools. Methods and materials in guiding the creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W) Whitney

113. Construction of Physical Education Equipment. Construction of and practice in the use of rhythmic instruments and play equipment. (3S) Whitney
120, 121, 122. Technique of Team Sports. For men students majoring in physical education. Prerequisites: P.E. 20, 21, 22. Students taught techniques of dual combatives and team sports. Each student expected to prepare a teaching syllabus of class work. (2F, 2W, 2S) Not taught 1949-50.

Heaton

130, 131, 132. Technique of Individual Sports. For men students majoring in physical education. Prerequisites: P.E. 30, 31, 32. Students taught technique of individual gymnastics, and aquatic sports. Each student expected to prepare a teaching syllabus for class work.

Heaton

150. Methods in Dance. The place of the various types of dance in the physical education program. Emphasis given methods of teaching these activities and practice in teaching class members. A syllabus required of each student. (4S)

Whitney

151. Techniques of Modern Dance. Advanced technique presented from the standpoint of the professional studio. Martha Graham technique and Humphrey-Weidman technique are covered. (3S)

Whitney

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 must be taken as a prerequisite. Emphasis on methods of teaching group dancing and creation of original routines. A syllabus is required. (2S)

Heaton

160, 161, 162. Techniques of Team Sports for Women. Upper division students majoring or minoring in physical education are taught techniques of teaching and officiating team sports.

Dutton

163, 164, 165. Techniques of Individual Sports for Women. Upper Division students majoring or minoring in physical education are taught techniques of teaching and officiating the following individual sports: Fall: swimming, diving, and tumbling; Winter: archery, badminton, and fencing; and Spring: golf, and archery.; Winter: badminton and fencing; and Spring: tumbling and tennis. (2F, 2W, 2S) Not taught 1949-50.

Dutton

14. Water Safety Instructor's Course. Prerequisite: An American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life saving and the use of small water crafts. Proper American Red Cross certification is given those students who pass the examination. (2S)

Vanderhoff

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. (2F, 2S)

D. Nelson

180. Corrective Physical Education. (Women) Facts in body mechanics which contribute to the basic principle of posture. Analysis of postural deviations, their prevention and correction. Prerequisites: Physiol. 106. (3W)

Dutton

181. Corrective Physical Education (Men). A study of the facts in body mechanics which contribute to the basic principles of posture. Analysis of postural deviations, their prevention and correction. Prerequisites: P.E. 106 (3W)

Vanderhoff

182. Physical Education in the Elementary School. A study of the characteristics of 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. Practical experience in all areas of the well-balanced physical education program will be included. (5F, 5S)

Dutton

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. (5F)

Hunsaker

184. Administration of Physical Education. Administrative 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. A comparison of the various systems in American intercollegiate football. (2F)

Melinkovich
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; various methods of defense and offense. (2W) Whitesides

190. Methods in Track and Field. How to train for various track and field events; their form and technique; conduct of the athletic meets; construction, use, assembling of all equipment used by the participants on the field; development of certain types of individuals for certain events. (2S) Linford

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) Preston

192. Tests in Physical Education. Practical studies of tests now in use and the technique of test construction. (3W) Hunsaker


196. 296. 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 cooperation in a united recreation program. (3W) Heaton

199. 299. Physical Education Seminar. (3F. 2W. 3S) Credit arranged.

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


PSYCHOLOGY

Arden Frandsen, Professor; D. R. Stone, Heber C. Sharp, Assistant Professors; Bonnie Clay, Instructor

Courses in the Department of Psychology contribute to the professional training and personal development of students in nearly every department of the college.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Some of the important areas of human activity in which the science is applied are: (1) Using psychological tests* of intelligence, aptitudes, interests, and personality for helping individuals to choose the educational, vocational, and social activities in which they are likely to contribute most to society and to gain most personal satisfaction; (2) applications of scientific principles of learning for easier, more rapid, and effective training of individuals in schools, in industry, in families, and in other situations where education of people is attempted; (3) preventing and/or correcting difficulties in school achievement, vocational inefficiency, personality and conduct abnormalities by diagnostic and remedial treatment when needed by certain persons and by general provisions for the cultivation and maintenance of mental health; and (4) scientific analyses of the individual and environmental conditions which affect development and performance (including work activities) in industry, school, home, and community.) Although psychology is a relatively young science, its research and practical applications have already resulted in significant contributions to human efficiency, usefulness, and happiness; persons now working and others who will prepare for professional service in psychology will have the opportunity for continuing and extending these important human services.

A major in psychology should prepare students for diagnostic and remedial teaching and for dealing with minor personality and conduct problems of children in the elementary school and in child guidance clinics; for guidance and psychological counseling in high schools; for teaching psychology, study habits, mental health, and personality development in high schools; for personnel work (at the junior professional assistant level) in industry, the U.S. Employment Offices, and in various Civil Service positions; and for graduate study in psychology, education, child development and social work. It is also a suitable major
SCHOOL OF EDUCATION

for students planning to study medicine, nursing, or law after graduating from college.

Lower division preparation for psychology. The best preparation for psychology is a broad cultural background. The following related courses in each of the major subject matter fields are suggested and should be chosen in relation to the psychological area of concentration.

<table>
<thead>
<tr>
<th>Biological</th>
<th>Credits</th>
<th>Exact Science</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Zoology 1</td>
<td>5</td>
<td>Physics 3</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 4</td>
<td>5</td>
<td>Math 34 or 35</td>
<td>3 or 5</td>
</tr>
</tbody>
</table>

*A testing and counseling service is also available to all students who would like help in making educational and vocational choices, and in problems of personal adjustment. This clinical and counseling service also provides opportunity for important work experience for students majoring in psychology. Inquire at Room 175, Main Building.

Language & Arts (Students who plan to do graduate work should consider taking French or German. All students must take English 10, and 110).

| English 2  | 3       | Social Science |
| English 5  | 3       | Sociology 70   | 5 |
| Speech 1 or 5 | 5 or 3 | History 4     | 5 |
| Art 3      | 3       | Political Science 1 | 5 |

Required Psychology courses for Lower Division are 53 and 71. Electives are 31, 33, 51 and 80. Last quarter sophomores may take Psychology 112 or 180 by permission of instructor.

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, 180, 181, 182, 183; and elective: from Psychology 31, 33, 55, 102, 108, 114 or 115, 121, 123, 140, 145, 175, 188, 191, 202, 231, 285; Mathematics 111; Sociology 170; Education 110, and 211; and Speech 167 or 173, Zoology 111, Art 132. Other courses related to the area of concentration can all be elected with permission of instructor.

A minor in psychology (which should include Psychology 53, 71, 102 or 105, 112, 127, 140 or 161, 181, and 183) is recommended for any high school teacher who expects to participate in the school guidance and counseling program, for social workers who do not take an undergraduate major in psychology, for students majoring in speech correction, for students whose major is business administration and who are interested in personnel administration, and for students majoring in other social sciences.

Master of Science Degree in Psychology. This degree meets the training requirements for the First Class School Counselor's Certificate issued by the State Board of Education, it prepares the student for more advanced positions in clinical psychology in government services and in other social agencies, or for work in industry, and it is the first step in graduate study toward the doctorate degree in psychology. Thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin study for the M.S. degree in psychology, where the individual did not major in psychology.

Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program of courses both in psychology and in related fields to meet the student's objective should be arranged. In preparation of a school counselor, courses would be chosen from psychology, education, social work, and sociology. Recommended courses in psychology are: Psychology 112, 191, 202, 214, or 215, 223, 231, 281, 282, 283, 288, and 217; Mathematics 111 or Education 211 or Psychology 212; plus courses in Psychology numbered between 100 and 200 which were not taken as an undergraduate student. Besides the student's special interests, the M.S. degree in psychology should include study in the following fields: (1) general; (2) systems, and history; (3) learning; (4) education and child; (5) clinical psychology; (6) mental hygiene and abnormal psychology; (8) social psychology; (9) personality and meaning; and (10) statistics. Upon completion of study for the M.S. degree the student will have become acquainted with all of these areas; some of them, however, may have been studied as an undergraduate student.
31. Psychology of Meaning. An introductory course designed to aid students to find the "meaning" of what they experience. Principles for the interpretation of speech, writing, and other forms of symbolic behavior are presented to add clarity of expression and understanding. (3S) Stone

33. Psychology of Personal and Social Adjustment. A course in mental hygiene for lower division students from every school in the College. How to acquire emotionally healthful patterns of behavior and to eliminate unhealthy patterns of behavior is considered. Mental hygiene principles are developed, and these are applied to personal and social behavior in several major life activities—educational, vocational, family, recreational, and religious. (3W) Sharp

51. Psychology for Nurses. (3) Time arranged. Staff

53. Elementary General Psychology. General principles of human behavior and experience including: nature of personality; factors determining development; how we learn, observe, and think; motives of human conduct; dealing with people, and the maintenance of personal efficiency and mental health. Intended for Lower Division students in all schools of the College. (5F, W or S) Stone and Sharp

71. Experimental Methods in Psychology. A study of the scientific method and of specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: General Psychology. (3F) Sharp

80. 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) Staff

102. Educational Psychology. A professional course for prospective high school teachers intended to increase understanding of personality and to develop greater insight into the 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) Frandsen and Stone

105. Child Psychology. The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional development of children from birth to adolescence. Generalizations with respect to 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 or S) Frandsen

108. Educational Psychology of the Elementary School Curriculum. 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. Tool subjects are emphasized. Prerequisite: General Psychology. (3W) Frandsen

112. Applications of Statistics to Education and Psychology. An elementary study of the statistical procedures used in handling test scores in the 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, Stone or Sharp

114-214. Independent Readings in Psychology. For students who cannot participate in the discussions in Psychology 115, this course provides an opportunity for independent readings and conferences on topics elected by the student. (2F, W or S) Frandsen, Stone or Sharp

115-215. 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 of periodical literature on some specialized topic, selected according to each student's interest. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2F, 2W, 2S) Frandsen, Stone or Sharp
116. Beginning Research in Psychology. To acquire some experience in research methods, students are supervised by a staff member in conducting minor experimental studies in psychology. Prerequisite: Elementary experimental psychology and elementary statistics. Time and credit to be arranged (not to exceed 3 credits.) Any quarter

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. Besides students majoring in psychology, the concepts of human differences should find useful applications in the study and work of students majoring in the other social and biological sciences—sociology, political science, economics, education, medicine, public health, and genetics. (3)

Frandsen

123 or 223. Psychology of Exceptional Children. The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment especially suited to their needs. The groups included are the mentally deficient, the gifted, children with serious personality and conduct problems. (3W)

Sharp


Frandsen or Sharp

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 Psychology. (3S)

Sharp

145. Mental Hygiene. Common personal and social adjustment problems of normal people. The course shows how people, in striving to attain a balanced satisfaction of motives in their major life activities, learn different modes of adjustment; effective patterns of behavior, a variety of maladjustive mechanisms, and non-adjustive reactions. It should aid in cultivating personal efficiency and mental health and increase understanding of the human problems dealt with by parents, teachers, social workers, and personnel workers. Prerequisite: General Psychology. (3W)

Sharp

155. Psychology of Business and Industry. Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice and the selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work, and the psychological aspects of training for work in business and industry. (Se also Business Administration 54). Prerequisite: General Psychology or instructor's approval. (3W)

Stone

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 is considered in terms of such topics as propaganda, institutional behavior, "social" neuroses, morale, leadership, membership, etc. Sociological concepts here serve as valuable context for the basic psychological elements in the analysis of the individual's personality development as he encounters the world. Prerequisite: General Psychology. (3W)

Stone

175 or 275. Physiological Psychology. Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisite: General Psychology. (3S)

Sharp

180. Psychological Backgrounds of Guidance. A survey of source material and principles useful in guidance. Intended for personnel workers and directors, teachers, and prospective teachers; also for those who want to prepare for further work in Clinical Psychology. Course material points out individual differences, measurement techniques and tests, sources and uses of vocational information, counseling methods and assumptions, securing information, the use of records, and coordination of guidance services. (4W or Su)

Staff
181 or 281. Clinical Psychology: Psychometrics Applied to Guidance, Adjustment Problems, and Remedial Teaching. 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. (SF) Frandsen

183 or 283. Clinical Psychology: Theory and Practice of Counseling and Psychotherapy. In educational and vocational guidance, in improving school achievement and worker efficiency, and in treating problems of personal and social maladjustments, the uses of the following procedures are studied: Non-directive counseling; directed problem-solving interviewing; giving advice, assurance, persuasion, and information; and of controlled family, school, club or camp, community, and institutional environments. Prerequisite: General Psychology. (SF) Frandsen

188 or 288. Practicum in Clinical Psychology. Students are assigned a testing schedule in the psychological clinic where they administer, score and evaluate tests, and participate in interpretive sessions. Prerequisite 181 or permission of instructor. Time and credit arranged (not to exceed 5 credits) (F, W or S) Staff

191. History and Systems of Psychology. A survey of the history of psychology and a critical comparison of the several systematic points of view on major problems in psychology. Alternates with 231. (SF) Stone

202. Advanced Educational Psychology. The contributions of modern theory and recent research to the following fundamental problems of teaching and guidance are studied: motivation, learning; improvement of study habits, uses of tests in guidance and in measurement of achievement; social psychology of childhood and adolescence; personality and conduct problems; and mental health. Problems for master's degree thesis are indicated. Prerequisite: Ed. Psych. (SF) Frandsen or Stone

212. Treatment of Psychometric Results. Statistical methods of representation, interpretation, and analysis of interrelationships of psychological test scores. (W) Frandsen—Sharp

216. Research on Special Problems in Psychology. Credit and time arranged, with the approval of a member of the Department of Psychology. Frandsen, Stone, Sharp

217. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. Frandsen, Stone, Sharp


285. Projective Methods for the Study of Personality. The dynamics of human adjustment and a file common projection methods for revealing motives, attitudes, and adjustment mechanisms in individual personalities. (3S) Frandsen
SCHOOL OF ENGINEERING AND TECHNOLOGY

J. E. Christiansen, Dean

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THE School of Engineering and Technology consists of the Division of En-
engineering and the Division of Technology.

The Civil and Agricultural Engineering curricula were established in 1888
when the College was founded. Automotive, Metals, and Woodwork and Build-
ning Construction were also established in 1888, but under the name of Mechanic
Arts. Degree work in Radio was established in 1929. Degree work in Aeronautics
was established in 1940, and in Air Conditioning and Refrigeration, and Welding
in 1947. The name of the School was changed from the School of Engineering,
Industries and Trades to its present name in 1947.

**Division of Engineering.** The Division of Engineering offers both under-graduate
and graduate work leading to Bachelor of Science and Master of Science degrees
in Agricultural Engineering and Civil Engineering. Both of these curricula in-
clude courses and majors in Irrigation and Drainage.

**Division of Technology.** The Division of Technology offers four-year curricula
leading to the Bachelor of Science degree in Industrial Technology, Radio and
Electronics, and Industrial Education. Majors are offered in Aeronautics, Air
Conditioning and Refrigeration, Automotive, Machine Tool Technology, Photo-
graphy, Radio and Electronics, Welding, and Woodwork and Building Construc-
tion. Graduate work is offered in Industrial Education. These degree curricular
are designed to train skilled technicians, supervisors, managers, plant operators,
shop and garage foremen, and teachers of Industrial Arts, and Trades and In-
dustries. They combine training in vocational skills, applied science, and general
education.

Technical short courses are offered in Aircraft and Engine Mechanics, Air
Conditioning and Refrigeration, Automotive Repair, Auto Body Reconditioning,
Carpentry, Diesel Repair, Machine Shop Practice, Photography, and Welding.
These short courses are designed to meet the needs of those who do not desire
a degree, but who wish to learn a skilled trade, and at the same time have an
opportunity to benefit from general college courses and to enjoy college life.

**Admission.** For general requirements see the Academic Regulations in the cata-
alog introduction. For entrance in the Division of Engineering, students must have
taken in high school, Advanced Algebra and Solid Geometry, or the equivalent,
or must complete, without credit toward graduation, Math. 33 and 34. These
should be taken concurrently during the Fall Quarter of the Freshman year.

**Scholarship.** All students must maintain an average grade of C or better to re-
main in College and be eligible for graduation. The faculty reserves the right
to accept toward graduation only credits with a grade of C or better. In the
Division of Engineering, it is important that students make a C grade or better
in all Mathematics taken during the Freshman and Sophomore years. Students
who fail to do this usually have difficulty with upper division engineering courses.

**Graduation.** Candidates for graduation must satisfy the general college require-
ments as listed in the Academic Regulations, with the exception of those per-
taining 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 future graduates of the School of En-
gineering and Technology will have ample opportunity for professional employ-
ment of an interesting and remunerative character.

**Faculty Advisors.** Personal contact with the student is provided through a system
of advisors 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 as-
sistance 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 both undergraduate and graduate work leading to the Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. The courses offered by the department of Irrigation and Drainage, constitute an important part of both curricula, and a major option for those wishing to specialize in this field. Many of the leaders in the field of irrigation and drainage are graduates of Utah State Agricultural College.

Objectives. The objectives of the four-year curricula in Engineering are to provide the student an opportunity to secure the thorough, fundamental, and technical education which is necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities which are essential to high professional attainment.

Upper Division Standing. A student must have completed a total of 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 the activities of the student branches of the national engineering societies, of which the following are represented, either by faculty membership or student chapters, or both: American Society of Civil Engineers, American Society of Agricultural Engineers, American Road Builders’ Association, Highway Research Board, American Concrete Institute, American Society for Engineering Education, and American Geophysical Union.

Summer Surveying Camp. During the summer session following the Sophomore year, a surveying camp is held where plane, topographical, and route surveying are taught. Completion of Summer Surveying Camp is required of all engineering students. Students taking this course must be immunized against Rocky Mountain Spotted Fever.

Engineering Seminars. Engineering seminars are a feature of the advanced engineering work. Courses 198 and 199 are required of all engineering students during the Senior year.

Field Trips. Field trips to local construction projects, engineering works, and industries are arranged for engineering students. All seniors in engineering are required to take a supervised field trip covering the major engineering works in the western United States. This trip is usually scheduled during the Spring Quarter.

Agricultural Engineering

J. E. Christiansen, O. W. Israelson, C. H. Milligan, Joseph Coulam, Professors; A. Alvin Bishop, Associate Professor; Spencer H. Daines, B. L. Embry, Assistant Professors; J. Donald Wadsworth, Instructor; Day L. Bassett, Collaborator.

For nearly a century in America, those agricultural problems that have demanded the help of engineers have been solved by civil, mechanical, and electrical engineers. During the last quarter century, the need and value of engineering services in agriculture have grown so rapidly and widely as to demand the development of a major field of engineering designated as Agricultural Engineering.

The Department of Agricultural Engineering offers instruction in courses involving the application of engineering knowledge to the solution of farm problems. The most important of these problems are in the fields of farm machinery, farm motors, rural electrification, farm buildings, farm sanitary equipment, soil erosion control, irrigation, and drainage.

A four-year curriculum leading to a Bachelor of Science Degree in Agricultural Engineering is offered. This curriculum includes mathematics, arts and sciences, fundamental subjects in the different engineering departments, agricultural courses selected to familiarize the student with modern agriculture, and a thorough treatment of the Agricultural Engineering courses.
Graduates from this curriculum have opportunity to work in the following fields: (a) The manufacture and development of farm machinery and equipment; (b) irrigation, drainage, and soil conservation; (c) rural electrification; (d) design and construction of farm buildings; (e) teaching, research, and extension in colleges, experiment stations, and in the United States Department of Agriculture; (f) agricultural engineering for farm papers and technical magazines; (g) selling and maintenance of farm equipment; and (h) management of large farms.

Students majoring in Agricultural Engineering should be well versed in farm practices and have a real interest in the agricultural industry.

The Agricultural Engineering Department has available for its use approximately 6,500 square feet of laboratory space. The farm power and machinery laboratory is equipped to service, overhaul, and maintain farm machinery. The facilities of the irrigation and drainage laboratories are ample to conduct both research and class exercises in all their various divisions. These laboratories are housed in the Engineering and Agricultural Engineering Buildings.

A major in Agricultural Mechanics is available to students registering in the School of Agriculture.

AGRICULTURAL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Agricultural Engineering

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<td>C.E. 192</td>
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<td>Ag. Econ. 105</td>
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<td>English 111</td>
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</table>

Courses

4. **Dairy Mechanics.** A study of the basic equipment found in modern dairy plants; their accessories and upkeep. Three lectures, one lab. (4F) 

14. **Farm Power for Agricultural Students.** The principles, operation, care and maintenance of internal combustion engines and electric motors. Prerequisite: Math. 34. Two lectures, one lab. (3F or S)
15. Farm Machinery for Agricultural Students. Principles of mechanics and materials as applied to farm machinery. The operation, adjustment, and care of the various types of agricultural machines. Prerequisite: Math. 34 or equivalent. Two lectures, one lab. (3W or S) Embry

105. Farm Woodwork and Building for Agricultural Students. Location, planning and construction of farm buildings. Wood and metal preservations, fences, and fencing and the farm workshop. Three lectures, two labs. (SP or S) Coulam

106. Farm Structures. Economics of farm buildings; insulation as it involves heating and ventilating; mechanics of farm buildings; types of construction; building materials; location and planning of the farmstead; fundamental requirements and design of farm buildings common to Western agriculture. Prerequisite: CE. 101, Three lectures (3F) Coulam

107. Irrigation Hydraulics. Principles of hydraulics that apply particularly to irrigation engineering. Special emphasis is given to flow of water in pipes and open channels, and water measurement. Prerequisite: Math. 99, Physics 20. Three lectures, one laboratory (4W) Staff


109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply, and farm sanitation; and farm electrical systems and appliances. Three lectures. Prerequisite: C. E. 101. (3W) Doines

110. Pumps and Pumping. Selection and installation of pumping equipment, theory of pumps, power schedules and cost of pumping. Prerequisite: A. E. 107. Two lectures. (2S) Milligan

111. Mechanisms in Farm Machinery. A study of mechanical methods of transmitting motion of farm machines, including cams, gears, universal joints, etc. Prerequisite: C. E. 101. Two lectures, one lab. (3F) Will not be taught during school year 1949-50. Doines

113. Farm Machinery Repair. Applied problems in farm machinery repair and maintenance. Prerequisite: Forging 81a and Welding 96, or equivalent. Three labs. (3F or S) Wadsworth

115. Farm Implements. Selections, operation, adjustment and care of the various types of agricultural machines. Prerequisite: C. E. 101. Three lectures, one lab. (4W) Embry

116. Farm Tractors. A study of design, operation, and performance of the farm tractor. Efficiencies and ratings as determined by the Nebraska Tractor Tests. Prerequisite: C. E. 101. (3W) Will not be taught during school year 1949-50. Doines


198. 199. Engineering Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two credits each quarter. Two lectures. (2W. 2S) Christiansen

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Two credits each quarter. Two lectures. (2W. 2S) Staff
Civil Engineering


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 curriculum in Civil Engineering has been carefully planned, and 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 the many phases of Civil Engineering. Special emphasis is placed upon work in Irrigation and Drainage.

A Summer Surveying Camp is required, and academic work is supplemented by local field trips during the Junior year, and a major field trip of approximately one week duration, during 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.

An analysis of the status of the Civil Engineering graduate from Utah State Agricultural College shows that approximately 80 percent are in federal, state, city, or county positions, and about 20 percent in private practice, or working for private corporations. Finding employment for graduates has not been a problem at this institution.

The Engineering departments are housed in the Engineering Building, where well equipped laboratories and classrooms provide ample facilities for the work in engineering. 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 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.

CIVIL ENGINEERING CURRICULA

Degree: Bachelor of Science in Civil Engineering

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<tr>
<th>Course Code</th>
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<td>Physics 20, 21, 22 F 5 W 5 Su 5</td>
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<td>Geology 3 F 5 Su 5</td>
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<td>English 17, 18, 19</td>
<td>3 3 3</td>
<td>Economics 51 F 5 Su 5</td>
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1—Required of students taking Sanitary Engineering Option.
2—Not required of students taking Sanitary Engineering Option.
3—Students deficient in high school mathematics, Algebra (b) and Solid Geometry, must register for Math. 34 and 33 during the Freshman year. Math. 33 and 34 do not count credit toward graduation in Engineering.
4—Shop includes Metalwork, Woodwork, and Weldings. All three courses are offered each quarter.
Junior

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Senior

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Senior Options

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<td>C.E. 133 or I.D. 146</td>
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<td>C.E. 194 or I.D. 145</td>
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Irrigation and Drainage

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Structural

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Sanitary

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Courses

1. 2. 3. Engineering Orientation. A preview of engineering; including what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. One lecture each week. Required of all Freshman Engineering students. One credit for completion of three quarter sequence. Christiansen

59. Blue Print Reading and Industrial Drawing. Primarily for majors in Business Administration. The reading and interpretation of blue prints, use of instruments, lettering, and elementary drawing, including construction of graphs, flow charts, etc. Three labs. (3W) Staff

60. Elementary Drawing. Primarily for Forestry students. The use of instruments, simple lettering, and drawing. One lab. (1F or W) Staff

61. Engineering Drawing. Use of instruments, lettering, applied geometry, orthographic projection, and technical sketching. Two labs. (2F or W) Staff

62. Advanced Engineering Drawing. Pictorial representation, conventional representation, dimensioning, working drawings, and lettering. Prerequisite: C.E. 61. Two labs. (2W or S) Staff

63. Descriptive Geometry. Principal and auxiliary views; points, lines, and planes; developments, intersections, and warped surfaces; mining problems. Prerequisites: C.E. 61, Mech. Draw. 91, or I.A. 20. One lecture, two labs. (3S) Staff

65. Engineering Problems. Practical engineering problems solved by the use of algebra and trigonometry. Methods of computations include the use of logarithms, slide-rule, and calculating machines. Special emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 46. One lab. (1F or S) Tingey

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. (2W) Tingey

5—Highway and Structural majors may substitute C.E. 130 for 143.
6—Not required of students taking Advanced Military. Advanced Military may also be substituted for one option course each quarter in the senior year.
81. Plane Surveying. Primarily for Forestry and Radio Students. Use of tape, hand level, level, transit, compass, etc. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math. 35 and 46. One lecture, two labs. (3F or S) Tingey

82. Mapping and Office Practice. Practice in mapping of the various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. Two lectures, one lab. (3W) Stock

84. Elements of Surveying. For engineers. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35 and 46. Two lectures, one lab. (3F) Stock

85. Advanced Surveying. For Engineers. Problems in chaining, leveling curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Two lectures, one lab. (3S) Stock

87. Summer Surveying Camp. Surveying office and field practice in camp. Topographic, land, route, and geodetic surveying. Actual field surveys are made. Students pay their own transportation and living expenses and the regular summer quarter registration fee. Immunization against Rocky Mountain Spotted Fever required for the course. Prerequisite: C.E. 85 or equivalent. Daily, eight hours a day, for six weeks. (7Su) Stock

101, 102, 103. Engineering Mechanics. Includes statics, dynamics, and strength of materials. The Fall Quarter and part of the Winter Quarter are devoted to the 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 the 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. 99. Three lectures, one lab. (4F, W or S) Watkins

105, 106, 107. Structural Theory and Design. This sequence introduces the student to the analysis and design of structural frameworks and their elements: C.E. 105 in steel and timber; C.E. 106 in reinforced concrete. In C.E. 107 students are given more comprehensive problems in the design of buildings and bridges, involving the use of principles already studied and including design computations and structural drawing practice. Prerequisites: Engineering Mechanics, C.E. 101, 102, 103. Fall and Winter Quarters, lecture daily, one lab; Spring Quarter, 3 lectures and 2 labs (6F, 6W, SS) Kepner


120. Roads and Pavements. Elements of highway engineering, Types of roads and pavements, methods of construction and maintenance, jurisprudence and finance. Prerequisite: C.E. 87. Three lectures (3S) Stock

124. Street and Highway Traffic Control. Collection and analysis of traffic data; causes and remedies for traffic congestion and accidents; traffic control devices; illumination of streets and highways; economics and administration of traffic control. Prerequisite: C.E. 120. Three lectures, one lab. (3F) Stock

125. Highway Design. Theory and practice in the design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisite: 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. (3S) Stock


131, 132. Structural Design Problems. Advanced work in the analysis and design of statically determinate and indeterminate structures. For students desiring to specialize in the structural field. Prerequisite: C.E. 105. Three lectures. (3W or S) Kepner

141, 142, 143. Fluid Mechanics and Hydraulics. Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, the
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: Physics 20, Math. 99. Two lectures, two labs. (4F, W, S) 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: Math. 122, C.E. 103, 142. Three lectures, one lab. (4F) Peterson

171. Hydrology. (Primarily for Forestry Students). Weather elements, factors influencing run-off, and influence of range and land-management practices on run-off and erosion. Three lectures. (3F) Staff

173. Hydrology and Meteorology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, infiltration, groundwater, and runoff methods of collection of hydrologic data and its use in water supply and flood control studies. Prerequisites: C.E. 142, or by special arrangement. Three lectures, one lab. (4S) Milligan

176. Application of Thermodynamics. For Air Conditioning, Aeronautics, and Automotive majors. The applications of the laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigeration are studied. Prerequisites: Math. 35, 44; Physics 22. 3 lectures. (3S) Woolrich

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: C.E. 63, 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 method used in highway, street, canal, pipe line and general project surveys. One lecture, one lab. (2S) Stock

190. Contracts and Specifications. Synopsis of the law of contracts. Prerequisite: Senior standing. Three lectures. (3W) Bishop

192. Engineering Economy. Financial and cost problems associated with engineering design, operation and construction. The determination of the economic alternative in engineering. Prerequisites: B.A. 100, Econ. 51. Three lectures. (3W) Peterson


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. Prerequisites: C.E. 142 and Bact. 70. Three lectures, one lab. (4S) Woolrich

195. Sanitary Design. Principles of design, construction, and maintenance of water purification plants and sewage treatment plants. Problems involving both functional as well as structural design features are included. Prerequisites: C.E. 193, 194. Three lectures, one lab. (4S) Kepner

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 W) Woolrich


198, 199. Engineering, Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two lectures. (2W, S) Christiansen

203. **Advanced Structural Design.** Design of modern indeterminate structures. Student selects suitable structure for design and proceeds from preliminary planning stage to complete detailing. Prerequisite: C.E. 132. Any quarter. (3) Peterson

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. (3F) Peterson

211. **Masonry Dams.** Design of rigid type dams. Stress analysis and design of gravity, gravity-arch, single arch, multiple arch, and deck types of masonry dams. Timber, steel, and other miscellaneous types are also considered. For graduate students and specially prepared seniors. Time arranged. (3W) Peterson

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 use. For graduate students and specially prepared seniors. Prerequisite: C.E. 143. Time arranged. (3S) Peterson

215. **Hydro-Electric Design.** Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. For graduate students and specially prepared seniors. Prerequisite: C.E. 143. Time arranged. (3S) Peterson

220, 221, 222. **Advanced Highway Engineering.** Economics of location and design; selection, improvement, and maintenance; traffic control, administration, finance and jurisprudence as applied to highways. Prerequisite: C.E. 125. (3F, W, S) Stock

230. **Special Problems in Civil Engineering.** Independent study of chosen problems in civil engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or graduate standing. Any quarter. Time and credit arranged. Staff


243. **Advanced Hydraulic Design.** Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: I.D. 147, C.E. 143, and Math. 122. (3S) Milligan

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. Prerequisites: Math. 122 and C.E. 150, or its equivalent. (3W) Peterson

251. **Advanced Soil Mechanics Laboratory.** Advanced laboratory work in soil mechanics. (1W) Peterson

298 **Graduate Thesis.** Time and credit arranged. Each quarter. Staff

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**Irrigation and Drainage**


Both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering, with majors in Irrigation and Drainage, are offered by this department.

The Department also carries on a program of research in collaboration with the Soil Conservation Service and the Bureau of Plant Industry, Soils and Agricultural Engineering, of the U. S. Department of Agriculture, under the direc-
SCHOOL OF ENGINEERING AND TECHNOLOGY

Irrigation and Drainage Courses

10. Irrigation for Agricultural Students. The principles and practices underlying efficient and economic use of water in irrigation, including land preparation, water measurement, irrigation methods, irrigation efficiencies, and simple structures, for the control of measurement of water. Three lectures, one lab. (4F or S) Bishop

12. Irrigation Practice. Sources and conveyance of irrigation water, from pumping plants, water measurements, preparation of land for irrigation, soil properties and plant characteristics in relation to irrigation, alkali, duty of water, and irrigation efficiencies. Three lectures, one lab. (4F or S) Bishop

112. Irrigation Principles. Especially for advanced students in Agriculture or Engineering, who have not taken I.D. 10 or 12. Principles of irrigation, including soil, water and plant relations, irrigation methods, irrigation efficiencies, salinity, etc. (3W)

145. Design of Drainage Systems. Drainage design in relation to soil properties, location of drains, flow into tile, properties of tile, drainage construction. Prerequisites: I.D. 12 and C.E. 142. Three lectures, one lab. (4S) Israelson

146. Design of Water Conveyance Irrigation Structures. Application of the 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. Two lectures, one lab. (3W) Bishop

147. Design of Water Control Irrigation Structures. Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: I.D. 146. Three lectures. (3S) Peterson

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 the application of water by both surface and sprinkling methods. Prerequisites: I.D. 146. (3S) Staff

149. Irrigation Institutions. Laws governing the acquirement, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; Federal legislation affecting water. Three lectures. (3F) Bishop


212. 213. Problems in Irrigation Agriculture. Advanced work on the major problems in agriculture under irrigation, including management of irrigation projects, consolidation of irrigation companies, formation of soil conservation districts, irrigation efficiencies, erosion control, irrigation and the alkali problem. Instruction in residence or in absentia. Time arranged. Credit according to work done. Each quarter. Bishop

241. Research in Irrigation and Drainage. The regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student research projects. A qualified student may elect a problem in any phase of irrigation or drainage in civil engineering for study at the College or elsewhere. Results in research may be used in part to meet the requirements for an advanced degree. This course is for research other than that for thesis. Research for graduate thesis is covered by I.D. 298 or C.E. 298. Credit according to work done. Each quarter. Time arranged. Staff
249. Advanced Irrigation Institutions and Management. Problems in laws
governing the acquirement and adjudication of water rights, and in the distribu-
tion of water, according to established rights; the improvement of irrigation and
drainage enterprises; and operation problems. Instruction in residence or in
absentia. Each quarter. Time arranged. Credit according to work done. **Milligan**

298. Graduate Thesis. Credit arranged. Each quarter. Time arranged. **Staff**

**DIVISION OF TECHNOLOGY**

**ERNEST C. JEPPSEN, Chairman**

The Division of Technology is one of the two divisions in the School of En-
gineering and Technology. It is composed of seven departments, namely: Aero-
nautics, Air Conditioning and Refrigeration, Automotive, Industrial Education,
Metallurgy and Mechanical Drawing, Radio and Electronics, and Woodwork and
Building Construction.

Beginning as a Department of Mechanic Arts in 1888, this work has expanded
and developed into the present Division of Technology with seven separate De-
partments. This growth is a result of efforts of this Institution to provide for the
"liberal and practical education of the industrial classes" as outlined in the
original charter for Land-Grant Colleges and Universities.

This Division, in an attempt to better meet the needs of the students, offers
three major programs:

I. **Industrial Technology Program.** Present day industry requires the services
of engineers, technicians, and skilled craftsmen. The Industrial Technology Pro-
gram is a four-year technical program leading to the degree of Bachelor of
Science in Industrial Technology (or Radio and Electronics). The training pro-
vided combines technical knowledge and manual skills with a broad general
college education. This program is designed to prepare technicians for technical,
supervisory or managerial positions in several fields of modern industry and is
an excellent foundation for entrance into industrial Civil Service positions, or
for private business. The 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, is for the professional training of teachers, supervisors,
and administrators in Industrial Education positions. Courses are offered during
the regular school year and the Summer Session. 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 work leading to the degree of Master of Science in Industrial Educa-
tion is also offered.

III. **Vocational Technical Program.** This program is designed to prepare
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 of a more special-
ized nature than the degree program.

This program is offered in close cooperation 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. The
instruction covers the practices of industry with emphasis on latest methods,
modern equipment, and live productive work. The instructors are men with 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 pro-
gram have opportunities for further progress and advancement in industry, as

*On leave 1949-50.*
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 pioneering in this field in its desire to provide the types of training specified in the Morrill Act of 1862, establishing the Land-Grant Colleges.

Aeronautics

H. A. Buntine, Assistant Professor; Lowell P. Summers, Louis Klein, Jr., Instructors.

This department offers instruction for the thorough training of skilled aircraft and aircraft engine mechanics and aeronautical technicians.

The Aeronautics Department is a fully certificated Air Agency complying with Civil Aeronautics Authority Regulations, and holds Certificate No. 1175 covering training of combined aircraft and aircraft engine mechanics. The curricula, equipment, and instructors have been properly certified in compliance with regulations for the training of aircraft and aircraft engine mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Aircraft and Aircraft Engine Mechanic Ratings. This training prepares graduates for both aircraft and aircraft engine 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.

Facilities include a new building with complete laboratories and modern equipment for instruction in aircraft engines, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.

The department is equipped with the latest type aircraft, engines and related units necessary for training in these fields. Also included are electroplating, sandblast, magneto and carburetor testing equipment. Training in the aircraft laboratories is supplemented by courses in the Machine Shop, Sheet Metal, Welding and Woodwork offered by the separate departments.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Aeronautics

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### Two-Year Vocational Technical Program
Certificate of Completion in Aircraft and Engine Mechanics

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**Description of Courses**

5. **5a. Composite Aircraft Structures.** (Technical and Shop.) The design, construction, repair and maintenance of composite aircraft, including wood structures, steel structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. Basic related instruction includes airfoils, types of aircraft, aircraft structures, parts and fittings, design factors, methods of fabrication, materials and processes and stress analyses. (Tech. 5; Shop 5; F) 

**Klein**

6. **6a. All-Metal Aircraft Structures.** (Technical and Shop.) The 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. The adaptation of stressed skin aircraft construction: a study of strength, weight and use of aluminum alloys, design factors, methods of fabrication, fittings, forgings, and extrusions; monocoque, and semi-monocoque structures; stress analysis; materials and processes. (Tech. 5; Shop 5; W) 

**Klein**

7. **7a. Aircraft Maintenance.** (Technical and Shop.) The maintenance, repair and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, instrument, 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 included and a thorough study of the operation of an approved Civil Aeronautics Administration Aircraft Repair Station. (Tech. 5; Shop 5; S) 

**Klein**

8. **8a. Aircraft Powerplants.** (Technical and Shop.) The 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, supercharged sections, cylinders 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. (Tech. 5; Shop 5; F) 

**Summers**
9. 9a. Aircraft Powerplant Accessories. (Technical and Shop.) The 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. (Tech. 5; Shop 5; W) Summers

10. 10a. Aircraft Powerplant Maintenance. (Technical and Shop.) Training in the repair and alteration, maintenance, and operation of modern aircraft powerplants, including periodic inspections, maintenance servicing, diagnosis of engine malfunctioning; engine installation, test and servicing; installation and maintenance of propellers, hydrostatic, constant speed, controllable and wood; use of special tools; major and minor engine repair and alteration; time and materials costs; and pertinent Civil Air Regulations. Related instruction includes the study of the operation of an approved Civil Aeronautics Administration Engine Repair Station. (Tech. 5; Shop 5; S) 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: 10, 10a. Three lectures. (3F) Buntine


105. Aircraft Woods and Plastics. Analysis of woods and plastics as applied to aircraft. Emphasis is placed on investigation and development of methods involving design criteria, applications of elastic theory, and effects upon structural analysis. Two lectures. (2S) Klein

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 (2W) Buntine

127. Aircraft Communication and Range Techniques. Standard airport control procedures; instrument flight regulations; control tower procedures and flight plans; orientation and beam bracketing; approach procedures and let down. Instruction correlated with link trainer operation. Three lectures. (3S) Buntine

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2S) Buntine

131. Time and Motion Study. The techniques of time and motion study and their inter-relationships. Detailed discussion and practice with process charts, multiple-activity charts, micromotion study. Threblig check lists, motion economy and stop watch time study. Methods of application and personnel problems involved. Two lectures. (2W) Klein

AERONAUTICAL GROUND AND FLIGHT SCHOOL

The Aeronautics Department in cooperation with the Veterans Administration, provides a co-ordinated Flight Instruction Program for Veterans. It consists of Ground School Courses in the Aeronautics Department at the College and Flight Courses at either of the local airports. This Flight Instruction Program is open to any Veteran approved for flight training in terms of his educational objective. For further information the Veteran should contact the Dean of his school.
Ground School Courses

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to the operation of aircraft, radio, and airway procedures. Two lectures. (2F, W or S) Summers

32. General Service and Operation of Aircraft. Aeronautical Ground School (Primary). Theory of flight, inspection, care and maintenance of aircraft and engines. Two lectures. (2F, W or S) Klein

33. Meteorology. Study of weather, maps, atmosphere, air masses, clouds and weather reports. Required by C.A.A. for any pilot rating above private. Three lectures. (3F, W or S) Buntine

34. Navigation. The study of maps, charts and other navigational problems. Required by the C.A.A. for any pilot rating above private. Two lectures. (2F, W or S) Buntine

135. Aeronautical Ground School (Advanced). Intensive course in aircraft, aircraft engines, propellers, construction, inspection, and general maintenance. Prerequisite: Aero 32. Five lectures. (5W) Buntine

Flight Courses

37. Private Pilot Certificate. Flight School Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for satisfactory completion. Prerequisites: Aero 31 and 32. (3F, W or S) Staff

137. Commercial Pilot Certificate. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certification. Prerequisites: Aero 31, 32, 33, 34, or Private Pilot Certificate and Aero 33, 34. (10F, W or S) Staff


Air Conditioning and Refrigeration

J. C. Sharp, Assistant Professor; A. Q. Woodruff, Instructors.

This department prepares skilled technicians in air conditioning and refrigeration and allied fields, including: (1) winter heating of small commercial buildings and homes; (2) sheet metal work; and (3) domestic appliances.

The courses are arranged to meet the needs of the industry and the requirements of the various national societies interested in air conditioning and refrigeration. A chapter of the Refrigeration Service Engineers Society (an international organization) is established on the campus and majors in this department are afforded the opportunity to join this society.

The air conditioning and refrigeration laboratories contain excellent equipment for the thorough study of domestic and commercial refrigeration, air conditioning, and sheet metal work. They are equipped with the newer type test instruments and tools for the practical and complete testing of all equipment in these fields.
## CURRICULUM

Degree: Bachelor of Science in Industrial Technology  
Major: Air Conditioning and Refrigeration

### Freshman

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### Two-Year Vocational Technical Program

Certificate of Completion in Air Conditioning and Refrigeration

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### Description of Courses

1. **1a. Basic Refrigeration.** (Technical and Shop.) Construction and operation of refrigeration units. The units include compression cycles, compressors, automatic controls, refrigerants and accessories used in refrigeration systems. Fundamental for all students in refrigeration. (Tech. 3; Lab. 3; F) **Sharp**

2. **2a. Domestic Refrigeration.** (Technical and Shop.) Continuation of 1 and 1a. Component parts are assembled and operated in various domestic boxes. Includes electric motors, hermetic units, absorption cycles, servicing and repair of domestic refrigerators. Prerequisites: 1 and 1a. (Tech. 3; Lab. 3; W) **Sharp**

7. **Principles of Refrigeration.** Principles and practices in construction, operation, and servicing of modern refrigerators and home freezer equipment. Includes motors, compressors, freezing units, temperature controls, and cabinets. Open to all college students. 2 lectures, 1 lab. (3F, W or S) **Sharp**

11. **1la. Commercial Refrigeration, Single Systems.** (Technical and Shop.) Construction, operation, servicing and repair of single system commercial refrigerators. Includes commercial boxes, commercial compressors, condensers,
evaporators, pressure reducing devices, and controls. Emphasizes the calculation and selection of proper size units so that a complete commercial refrigeration system will operate correctly. Commercial refrigerators are studied and tested in actual operation in relation to capacity, efficiency, and operating characteristics. (Tech. 3; Lab. 3; S)  

12. 12a. Commercial Refrigeration. Multiple Unit. (Technical and Shop.) Construction, operation, servicing and repair of multiple type commercial refrigerators. Includes commercial low side floats, two-temperature valves, electric solenoids, two position and modulating shut-off valves. Temperture valves, pressure controls, and carbonators. Heat pumps are assembled and tested. Multiple units are assembled, run, and tested for the various service problems encountered in commercial servicing of high, medium, and low temperature work. (Tech. 3; Lab. 3; F)  

Woodruff

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Woodruff

21. 21a. Air Conditioning. Domestic Types. (Technical and Shop.) Design, construction, operation, servicing, and repair of domestic air conditioning instruments and equipment. Includes sling psychrometers, psychrometric charts, humidistats, thermostats, evaporative coolers, unit air-conditioners, filters, gauges, hygrometers and anemometers. (Tech. 3; Lab. 3; W)  

Woodruff

22. 22a. Air Conditioning. Commercial Types. (Technical and Shop.) Design, construction, operation, servicing, and repair of commercial air conditioning equipment. Includes air conditioning compressors, evaporators, duct work, air conditioning controls, pilot tubes, decibel meters, psychological aids, and comfort charts. A typical commercial air conditioning unit is assembled and used for analyses and correction of operational difficulties encountered in this type of equipment. Prerequisites: AC&R 21 and 61. (Tech. 3; Lab. 3; S)  

Woodruff

31. 31a. Refrigeration Tools and Copper Tubing. (Technical and Shop.) Types, construction, and proper use of hand tools used in refrigeration service work. Bending and soldering of hard and soft drawn copper tubing. (Tech. 2; Lab. 2; F)  

Woodruff

32. 32a. Refrigeration Motors. (Technical and Shop.) Construction, operation, servicing and repair of electric motors used in refrigeration installations. Prerequisites: RA 21. (Tech. 2; Lab. 2; W)  

Woodruff

33. Thermostatic Expansion Valves. (Technical and Shop.) Construction, operation, servicing and repair of thermostatic expansion valves. Prerequisites: 1, 1a and 2, 2a. (Tech. 2; Lab. 2; S)  

Staff

34. 34a. Design of Commercial Refrigeration Units. (Technical and Shop.) A study of the problems of selecting refrigeration components in designing small commercial refrigeration units. Actual problems will be assigned for solution. Experiments in the lab will be used to test the results of these problems. (Tech. 2; Lab. 2; F)  

Staff

41. 41a. Fans and Blowers for Air Conditioning. (Technical and Shop.) Construction, operation, servicing and repair of fans and blowers used in air conditioning work. Shop tests to acquaint students with fan and blower operation will be made. (Tech. 2; Shop 2; W)  

Woodruff

42: 42a. Duct Work. (Technical and Shop.) Design, construction, and testing of representative field conditions for various size ducts used in air conditioning work will be studied. (Tech. 2; Shop 2; S)  

Woodruff

61. Sheet Metal Work. Principles and practices in the use of the sheet metal tools, equipment, and materials; forming, fabrication, and layout techniques as related to the air conditioning industry and the building trades. Prerequisites: Mech. Dwg. 92. 2 lecture, 1 lab. (3W)  

Staff

111. Low Temperature Refrigeration. Advanced training in the principles, construction, operation and repair of low temperature refrigeration equipment. Prerequisites: AC&R 12 and 12a. 2 lecture, 1 lab. (3W)  

Sharp

112. Advanced Commercial Refrigeration. Advanced technical training in the design and testing of commercial and industrial refrigerating units. Special emphasis will be placed on refrigerating cycles, heat transfer problems, nomographs for refrigerants, methods of testing the complete refrigerant plant, food freezing problems, etc. 2 lectures, 1 lab. (3S)  

Sharp
121. Industrial Air Conditioning. Advanced technical training in the principles, construction, operation and repair of industrial air conditioning equipment. Prerequisites: AC& R 22 and 22a. 1 lecture, 2 lab. (3S) Staff

151. Electric Motors. Advanced technical training in the principles, construction, operation and repair of the motors used in air conditioning and refrigeration equipment. Prerequisite: Ra. 21. 2 lectures, 1 lab. (3F) Sharp

152. Air Conditioning Electric Circuits. Advanced technical training in the principles, construction, operation and repair of the electric circuits used in air conditioning and refrigeration. Prerequisite: Ra 21. 2 lectures, 1 lab. (3W) Sharp

153. Principles of Electric Circuits. The fundamentals of electric circuits in series and parallel, electromagnetism, commercial conductors; types of circuits and code requirements. Experiments demonstrating circuit phenomena and their relation to power, power factor and frequency; inspection of industrial wiring installations. Prerequisites: Physics 21. (Loc. 3; Lab. 1) (4F) Staff

154. Direct Current and Alternating Current Machinery. The characteristics, control, and uses of the more important types of generators and motors. Laboratory tests to determine performance, to locate faults and to correct abnormal conditions; inspect commercial installations. Prerequisites: AC&R 153. Three lectures, one lab. (4W) Staff

155. Electrical Control Circuits. The characteristics and uses of the more commonly used electrical control instruments. Laboratory tests and hook-ups of the various types of solenoids, motor starters, relays, etc., being used in modern industry. Prerequisites: AC&R 154. Three lectures, one lab. (4S) Staff

161. Stokers and Oil Burners. Technical training in the principles, construction, operation and repair of the modern coal stokers and oil burners. Prerequisites: AC&R 22 and 22a. Two lectures, one lab. (3S) Sharp

162. Instrument Technology. Technical training in the principles, operation and repair of pressure and temperature instruments. Two lectures, one lab. (3S) Staff

191, 192, 193. Advanced Laboratory Work. Advanced laboratory work in the construction, testing, and repair of specialized air conditioning and refrigeration equipment. For junior and senior students majoring in Air Conditioning and Refrigeration. One lecture, two lab. (3F, W or S) Sharp

194. Seminar. Current topics in production methods, cost, design, supply and organization of interest to air conditioning and refrigeration majors. (3S) Sharp

Automotive Technology

Edward L. France, Assistant Professor; Clyde Hurst, Owen Slaugh, Lynn Willey, Vern R. Beecher, Instructors.

This department offers instruction in Automotive and Diesel Technology, Automotive and Diesel Mechanics, and Auto Body Reconditioning. It also provides general service courses for students in other departments who desire to become familiar with the various phases of the automotive field.

Training facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the latest and most modern servicing equipment and are excellently lighted and ventilated to provide ideal conditions for study in this type of work.

A Bachelor of Science degree in Industrial Technology is offered with majors in Automotive or Diesel. A major in these fields prepares a student as a technician who can better interpret the designs of the engineer and direct the work of the repairman. This major also prepares students to become shop foremen, shop superintendents and with special preparation, school instructors. These curricula provide excellent foundations for entrance into civil service, private business and managerial positions with large companies.
A certificate of completion is offered in Automotive or Diesel Mechanics and Auto Body Reconditioning for students who desire intensive short term training to prepare them as skilled mechanics.

Students wishing to better prepare themselves for advanced or graduate study at other institutions in Automotive, Diesel or closely allied fields of engineering may do so by substituting mathematics and engineering courses during their junior and senior years.

**CURRICULUM**

Degree: Bachelor of Science in Industrial Technology
Major: Automotive Technology

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Certificate of Completion in Diesel and Heavy Duty Mechanics

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1. 1a. Steering Correction. (Technical and Shop.) The construction, operation, and repair of the parts of the automobile chassis. The units covered are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, wheel balancing, frame straightening, and brakes. Modern methods of repair. (Tech. 5; Shop 5; F) Beecher

2. 2a. Automotive Engines. (Technical and Shop.) The 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. (Tech. 6; Shop 5; W) Beecher

3. 3a. Driving Mechanisms. (Technical and Shop.) The construction, operation, and repair of clutches, transmissions, overdrives, universals, drive shafts, differentials, and rear axles. Modern methods of repair. (Tech. 5; Shop 5; S) Beecher

4. 4a. Fuel Systems. (Technical and Shop.) The construction, operation and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls, and special devices such as superchargers, governors, and auto diesel engine fuel systems. Modern methods of repair. (Tech. 5; Shop 5; F) France and Slough

5. 5a. Auto Electrics. (Technical and Shop.) The construction, operation and repair of the electric systems used on modern automotive equipment, including the battery, lighting systems, ignition systems, starting and generating systems. Modern methods of repair. (Tech. 5; Shop 5; W) Beecher and Slough

6. 6a. 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 and these troubles remedied by trade-accepted methods. (Tech. 5; Shop 5; S) France and Slough

11. 11a. Chassis Alignment. (Technical and Shop.) The repair and alignment of chassis frames, front and rear axles, wheels, and steering mechanisms. Latest methods are stressed in the checking and correcting of damaged automobile chassis units. (Tech. 5; Shop 5; F) Slough

12. 12a. 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. (Tech. 5; Shop 5; F) Willey

13. 13a. Body Reconditioning. (Technical and Shop.) The construction and repair of automobile bodies. Units include the checking and alignment of automobile bodies and the repair and replacement of damaged body panels, such as the dash, cowl, trunk, rocker, floor, side, top and door panels. (Tech. 5; Shop 5; W) Willey

14. 14a. Body Mechanisms. (Technical and Shop.) The repair and replacement of modern automobile body mechanisms, including mechanical, electrical, and hydraulic regulating devices, windshield wipers, body wiring, and lights. (Tech. 5; Shop 5; S) Hurst

15. 15a. Auto Trimming and Upholstering. (Technical and shop.) The repair, cleaning, dyeing and replacement of all auto body upholstery. Units covered are floor coverings, headlinings, door and quarter trim pads, windshield and trim mouldings, seat cushions, and sewing machine operation. (Tech. 5; Shop 5; W) Willey
16. 16a. **Automotive Refinishing.** (Technical and Shop.) The preparation of body metal and the application of lacquer and synthetic enamels, including metal preparation, priming, surfacing and the application of color. Practice in spotting, striping, and graining. (Tech. 5; Shop 5; S) Willey

21. 21a. **Heavy Duty Chassis.** (Technical and Shop.) The construction, operation and repair of automotive diesel and heavy duty chassis. The units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (Tech. 5; Shop 5; F) Hurst

22. 22a. **Automotive Diesel Engines.** (Technical and Shop.) The construction, operation and repair of automotive diesel engines, including two-stroke cycle and four-stroke automotive, truck and tractor engines together with their accessories. (Tech. 5; Shop 5; W) Willey

23. 23a. **Heavy Duty Drives.** (Technical and Shop.) The construction, operation and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (Tech. 5; Shop 5; S) Hurst

51. **Automobile Chassis.** Principles and practice in the construction, operation, and servicing of the modern automobile chassis. The units of the course include axles, wheel suspension, steering gears, frames, springs, universals, driveshafts and brakes. Open to any college student. Two lectures, two 2-hr. labs. (3F)

53. **Automobile Electricity.** Principles and practice in the construction, operation, and servicing of the electrical systems used on the modern automobile. The units to be covered include starting, generating, lighting, ignition, and special accessory systems. Two lectures, two 2-hr. labs. (3S) Slaugh

61. **Body and Fender Repair.** Principles and practice in the 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)

62. **Upholstering.** Principles and practice in the repair of modern upholstery. Rebuilding and recovering of automobile upholstery and home furniture. A practical course in upholstery repair. Open to any college student. Two lectures, two 2-hr. labs. (3W) Willey

151. **Carburetion.** Advanced technical training in fuels and carburetion as applied to the modern automobile, including fuel pumps, carburetors, manifolds and controls. Also principles of combustion, compression and exhaust gas analysis. Prerequisite: Auto 52 or equivalent. Two lectures, two 2-hr. labs. (3F)

152. **Motors, Generators and Magnetos.** Advanced technical training in the construction, operation and repair of the starting motor, generator, magneto, and their controlling devices. Prerequisite: Auto 53 or equivalent. Two lectures, two 2-hr. labs. (3W)

154. **Seminar and Special Problems.** A systematic review of the automotive field with discussions and reports on recent developments. Laboratory analysis of special problems encountered in automotive work. Prerequisite: Auto 151 and 152. Two lectures, two 2-hr. labs. (3S)

162. **Metal Refinishing.** Principles and practice in preparing of metal for refinishing. Fundamental procedures in priming, surfacing, and applying of lacquer and enamel. Two lectures, two 2-hr. labs. (3S) Willey
Industrial Education


This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. Students completing their undergraduate work receive a Bachelor of Science degree in Industrial Education, with a major in Industrial Arts Education or Trade and Industrial Education.

The Master of Science degree is offered in Industrial Education with majors in Industrial Arts Education or Trade and Industrial Education. The following courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments: I. E. 102, 104, 107, 109, 110, 111, 120, 121, 123, 124, 167. Courses in the 200 series are intended for graduate work. Registration in these courses requires the approval of the major professor and the instructor concerned.

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 Sciences, Education, Industrial Arts Technical and Professional, and basic shop skills. The catalog description of each course in the curriculum will be found 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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*On leave, School year 1949-50.
Industrial Arts Courses

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, wiring, etc. Two 3-hour labs. (2S) Hailes.

43. Recreational Crafts. Especially for students majoring in recreational leadership. Consists of two parts: (1) planning and organizing craft work as a part of community recreational programs, and (2) laboratory work in various craft fields, such as wood, leather, plastics, archery, metals, etc. One lecture, one 3-hour lab. (2F) Hailes.

112. Observation and Directed Teaching. Students observe and teach in Industrial Arts shops near the College. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the State in both junior and senior high schools. (8W or S) Mortimer and Hailes.

113. Driver Education and Traffic Safety. To acquaint prospective teachers and others with available instructional materials in the field of driver education and the latest methods of presenting such materials in the classroom and on the road. Supervised practice will be arranged for each student. (3S) France.

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 prospective instructor constructs projects that are suited to the work recommended by the State Department of Education. They also prepare lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisites: Course of Study Building and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. Three lectures, five 2-hour labs. (8W) Mortimer and Hailes.

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 Work 51b. Two 3-hour labs. (2S) Hailes.

142. Plastics. Acquaints students with the new and important group of plastics materials now being produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. Special emphasis will be given to the place of plastics in a modern industrial arts program. Three 3-hour labs. (3F) Hailes.

TRADE AND INDUSTRIAL EDUCATION

Designed primarily for instructors and supervisors in Vocational Technical Education and/or in Vocational Industrial Education Programs. A candidate for this degree 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 fields may be substituted for the teaching experience. The trade and teaching experience must be approved by a committee consisting of the Chairman of the Division of Technology and the Department Heads concerned.

CURRICULUM

Degree: Bachelor of Science in Industrial Education
Major: Trade and Industrial Education

A. 48 credits Trade training or equivalent.
B. 49 credits General group and English composition requirements.
C. 33 credits Education and psychology (upper division)
D. 20 credits Technician training (upper division)
E. 36 credits Recommended electives (including English 111)
F. 6 credits MS or PE

192 Total credit hours

*Students deficient in high school mathematics, algebra (b) should register for Math. 34.
Industrial Education Courses

21. Industrial and Labor Relations. Basic aspects of labor and management relations in present day industry, with attention to the human element in industrial relations. An orientation course for students preparing to enter industry with a certificate of completion in a two-year vocational technical program. Three lectures. (3S) McBride

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, stereoptical projection, recording, sound systems, and other aids suitable for classroom and auditorium use. Three lectures. (3; arranged) Staff

104. 204. Occupational Analysis. Principles and practice in analyzing occupations for the purpose of determining teaching content. Students complete an analysis of one unit for a trade or occupation. Three lectures. (3; arranged) Staff

107. Principles and Objectives of Industrial Education. Acquaints students with the general philosophy and purposes of Industrial Education, and enables them to understand and appreciate its place in the modern educational program. Students study and compare the general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three lectures. (3F) Staff

109. Course of Study Building in Industrial Education. To teach students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, references, tests, and instructional schedule. Each student prepares this work for one unit of instruction. Five lectures. (SF) McBride

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. Three lectures. (3S) Mortimer

111. The General Shop. Consists of a comprehensive study of the "General Shop" type of organization; its advantages and limitations; the content and organization of subject matter applicable to this type of organization, together with suitable methods for presenting subject matter. Class control and the trends of the program are given consideration. Prerequisite: I.E. 107. Three lectures. (3; arranged) Staff

120. Personnel Relations. Training for leadership in industry as foremen, supervisors and directors. Problems in organizing, supervising, training and directing personnel. A series of directed conferences based on student experiences and directed studies in leadership problems and principles. Three lectures. (3F, W or S) McBride

121. Methods in Industrial Education. The latest methods and techniques of teaching as applied to individual and group instruction in the fields of industrial Education. Each student has the opportunity of using these different methods in presenting lessons before the class. Three lectures. (3W) Mortimer

124. History of Industrial Education. Deals with the historical developments of manual and industrial education from the early leaders to the present time. Emphasis is given to the influence that various leaders and movements, both in Europe and America, have had upon present day objectives of industrial arts and vocational industrial education. Three lectures. (3; arranged) Staff

154. Measurements 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 an intelligent use of the tests are covered. Prerequisites: Psy. 102. Three lectures. (3; arranged) Staff

167. Special Problems in Industrial Education. Designed for qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Approval of the major professor and instructor must be obtained. Any quarter. Time and credit arranged. Staff
251. Administration of Industrial Education. The laws, regulations and policies affecting Industrial Education Programs; organization and management necessary for the successful operation of these programs; and pertinent problems and their solutions. Students prepare a plan of administration suitable for their school or district. Three lectures. (3; arranged) Staff

252. Supervision of Industrial Education. Latest methods in supervision of Industrial Arts Education and Trade and Industrial Education. For administrators, supervisors, and teachers in service who are responsible for the improvement of industrial arts and vocational education through supervision, or for students who wish to prepare for supervisory work. Students prepare a plan of supervision suitable for their situation. Three lectures. (3; arranged) Staff

253. Coordination in Industrial Education. Functions of coordinators in their relationship to the administration and supervision of industrial education programs; responsibilities and duties of coordinators; emphasis on procedures most successful in performance of these duties. Three lectures. (3; arranged) Staff

255. Techniques in Writing Instruction Sheets. Principles underlying the development of instruction sheets for use in industrial arts and trade and industrial education programs. Three lectures. (3; arranged) Staff

259. Planning and Equipping Industrial Education Buildings. 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 the basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to the solution of their own particular problems. Two lectures, one 3-hour lab. (3; arranged) Staff

260. Diversified Occupations. Content, methods, and special devices to be used in the teaching of Diversified Occupations. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of instruction in Diversified Occupations. Three lectures. (3; arranged) Staff

261. Part Time Education. Content, methods, and special devices to be used in Part Time Education programs. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for a course in Part Time Education. Three lectures. (3; arranged) Staff

262. Supervisory Personnel Development Institute. An institute for the training of conference leaders, supervisors, and administrative personnel in the methods and techniques of presenting conferences, and personnel training. Three lectures. (3; arranged) Staff

263. Evening School Programs. Development, organization and improvement of evening school programs in Industrial Education. Students prepare a syllabus covering the essential materials needed for such a program. Three lectures. (3; arranged) Staff

264. Conference Leading. Principles and practice in conference leading as it applies to the methods used in industry. Emphasis given to the preparation, use, and evaluation of this method as it affects Industrial Education Programs. Three lectures. (3; arranged) Staff

265. Apprenticeship. Development, organization, and improvement of apprentice training programs for industry. Students prepare a syllabus covering the essential materials needed for such a program. Three lectures. (3; arranged) Staff

266. Related Instruction. Content, methods, and special devices used in teaching related subjects in Vocational programs. Emphasis on pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of Related Instruction. Three lectures. (3; arranged) Staff

267. Reading and Conference. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with the approval of the department head, investigation being carried on under the direction of the major professor. (Arranged) Staff

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. (Arranged) Staff
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 credits each quarter.

Note: In an effort to be of maximum service to the Industrial Education teachers and supervisors in this Intermountain Region in keeping them current with the national picture in Industrial Education, the Industrial Education Department has organized special courses primarily for these teachers in service as they attend Summer Session to do graduate work. The notation "Arranged—Staff" is made for the specific purpose of bringing in as visiting staff, noted leaders for these courses as the situation demands.

PHOTOGRAPHY

H. Reuben Reynolds, Professor; Bert V. Allen, Lucy V. Heaton, Instructors.

The photography unit is jointly administered by the departments of Industrial Education in the School of Engineering and Technology and the Department of Art in the School of Education. General service courses are available for college students desiring instruction in the fundamentals of photography and in advanced work in this field. A special two-year curriculum is available for students wishing to prepare themselves as Commercial Photographers. Sufficient courses are available for a major in photography for those desiring a Bachelor of Science degree in Industrial Education, or in Education, depending upon the school in which the student is registered and upon the selection of other courses. Students may also select photography as a minor with the approval of their major professor.

Some of the courses offered are designed especially as service courses for students registered in Agriculture, Journalism, Engineering and Technology, Forestry, and other specialized fields where photography will supplement their major.

Two-Year Curriculum in Photography leading to a Certificate of Completion in Commercial Photography

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Description of Courses

51. General Photography. Principles and practices in the fundamentals of general photography. Training in the selection and use of cameras, lenses, meters, films, filters, lights, developers, and accessories. Two lectures, one 3-hr. lab. (3F, W or S) Heaton

61. Introductory Photography. Training in taking still pictures. The units include selection of materials; exposing and developing of films; contact printing; enlarging; and trimming and mounting of prints. This is the first of a series of units in photography having as their objective the preparation of technicians in this field. Three lectures, one 3-hour lab. (3F, W or S) Allen

62. Industrial Photography. Training in news, architectural, and machine photography. The units include photoflash, interior lighting, action and news, still life, table-top, fashion, building, machine and aerial photography applied to this field. Blocking, photomontage, and air-brush work also are included. Two lectures, three 3-hr. labs. (SF) Allen
63. 163. Agricultural Photography. Training in all types of agricultural, stock, and poultry, and farm photography. Also aerial photography applied to this field. Two lectures, three 3-hr. labs. (SS) Allen

64. 164. Motion Picture Photography. The technique needed in the various types of work in 8 mm. and 16 mm. cameras and projectors. Planning the production, camera technique, lighting, filters, close-up photography, titles, editing and projection. Two lectures, three 3-hr. labs. (SS) Reynolds

65. 165. Portrait Photography. Training in portrait and group photography. The units include model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Considerable emphasis will be placed upon child and home portraiture. Two lectures, three 3-hr. labs. (SW) Allen

66. 166. Color Photography. Problems in color, Ektachrome and Kodachrome, use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32. Two lectures, three labs. (SF) Reynolds

67. 167. Abstract Composition. Symbolic interpretation, texture studies, symbolism in portraiture, table-top technique, negatives combined with photographs, solarization and multiple exposure, and other techniques used in modern advertising and illustration. Two lectures, three labs. (SW) Reynolds

151. Photographic Problems. Special problems in advanced photography. Designed to meet the needs of individual students in solving advanced photographic problems. Two lectures, two 2-hr. labs. (SW) Allen

Metalwork and Mechanical Drawing

The Department of Metalwork and Mechanical Drawing is composed of four units: Machine Tool, Welding, Forging, and Mechanical Drawing. While these units have separate laboratories and are complete within themselves, yet they function together as a coordinated program in Metalwork.

The department, through each of its four units, offers general service courses for those students desiring basic instruction in Metalwork. It also offers two-year courses for those students preparing to enter the skilled occupations.

The curricula lead to the degree of Bachelor of Science in Industrial Technology, with majors in Machine Tool Technology or Welding. The courses are listed under the separate units of this department.

MACHINE TOOL TECHNOLOGY

Frederick Preator, Professor; G. Merrill Shaw, Assistant Professor. W. Karl Somers, Instructor.

This department offers a four-year degree program which leads to the degree of Bachelor of Science in Industrial Technology. To young men with special aptitudes in mechanical work, mathematics, and drafting, an excellent opportunity is provided to train for precision tool work, jig and fixture design, tool and gage making, and tool design. Work taken in this department lays a foundation for work in closely allied fields such as: mechanical inspection, production control, tool planning, tool engineering, or designers in the several branches of engineering.

The machine tool laboratory courses also give excellent training for students who are preparing for a career where mechanical work is needed. Students in engineering, electrical work, auto mechanics, diesel work, or work with farm machinery will find these courses suited to their needs.

The machine tool laboratories have a floor space of 5,000 square feet with an additional heat-treating and inspection laboratory. They are equipped with: 25 engine lathes, three milling machines, one planer, three shapers, three precision tool grinders, five drill presses, five tool grinders, one Doall machine, two punch presses and one power hack saw. The laboratory is well supplied with all the necessary hand tools such as vises, bench tools, drills, reamers, gages, taps, dies and micrometers.
The heat-treating laboratory has five electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. The inspection laboratory has precision gage blocks, sine bars, electric comparators, polishing heads and microscopes for mechanical inspection work.

The degree course places emphasis on training students who will be well prepared to work with experimental problems, mechanical developments, and research. There is an increasing need for well-trained men in these fields.

All members of the teaching staff are qualified members of the American Society of Tool Engineers, and sponsor a Tool Engineers club affiliated with the National Society. For junior and senior students field trips to industrial plants are conducted each year.

**CURRICULUM**

Degree: Bachelor of Science in Industrial Technology  
Major: Machine Tool Technology

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**Description of Courses**

Any five credit course in Machine work may be completed by taking part of the course during one quarter and the other part during a later quarter. The letters A, B, C, D attached to any five credit course number indicates, respectively, two credits, three credits, three credits, and two credits. A and B indicate the first part of the course and C and D the latter part. For example: 51a, two credits; 51b, three credits; 51c, three credits; 51d, two credits.

51. 52. **Machine Tool Practice.** Training in the use of hand tools, and in bench work and tool sharpening, together with elementary training on drill press and engine lathe. Tools and machine parts are made that give practice in the operations essential to machine shop work. Included are assignments of reading on machine work subjects, and application of mathematics to machine work. (5F W)

53. 54. **Machine Tool Practice.** (Shaper and Milling Machines.) An introduction to work on the shaper, planer, and milling machines. A program is outlined to develop the student's ability on these machines so as to give him a broader training for advanced work (5F S)

**Note:** Three credit courses in Machine Practice are scheduled each quarter. See Time Schedule Bulletin.

56. **Machine Practice for Engineers.** Designed to acquaint engineering students with basic machine shop operations, including the use of hand tools,
bench work, tool sharpening, and elementary engine lathe and drill press operation. (2F, W or S) Somers

57. Precision Inspection. The theory and practice of precision measurement is given in lecture and demonstration. Students learn to use gage blocks, precision measurement equipment, to check calculations, to read material specifications, and to make a complete inspection. (Prerequisite: Math. 44) (2W) Preator

58. Manufacturing Processes. A course to acquaint the student with fundamentals of important manufacturing processes such as: foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; to know the possibilities and limitations of the processes and their application to the fabrication of industrial products. (2W) Somers

150. Metals and Heat Treatment. A study of the physical properties, composition, constituents, and heat treatment of metals used in industry. The metals and heat treatment studied include cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. (Prerequisite: Chemistry 10, 11) (2F) Preator

151, 152. General Machine Work. Advanced lathe, planer and milling machine work, grinding milling cutters, making general shop tools, and special shop equipment. (Prerequisites: M.W. 51, 52, 53) (2F) Somers and Preator

153. Tool Work. An introduction to tool and die making. The student makes for his own use the specialized and valuable tools and equipment which are necessary for making and assembling the projects in the tool and die courses. Required of all major students. (5S) Somers

181, 182, 183. Tool and Die Making. Three courses in tool work. Problems in gage making, jig and fixture work, and die work, with design problems. Prerequisites: Mech. Dwg. 95; M.W. 150, 153; Math. 44. (5S, W or S) Preator

MECHANICAL DRAWING

Frederick Preator, Professor; G. Merrill Shaw, Assistant Professor.

The Mechanical Drawing unit is in the Metalwork Department and offers its service courses in drafting to all departments of the college.

The drafting unit consists of two well-lighted laboratories with a total floor space of 2700 square feet, and is equipped to handle 60 students at individual drafting tables. Modern equipment such as drafting machines, and the different printing machines and printing processes are made available to the students.

The mechanical drawing classes 91, 92, and 93 are basic courses and are offered as services to all departments. Special emphasis is placed on the fundamentals of good drafting room practices, and on the types of drawings used in industry.

Students may qualify for a minor in mechanical drawing on completion of 18 credits including C.E. 63, Descriptive Geometry.

91. 92. 93. Mechanical Drawing. The use of instruments applied to template drawings, graphic solutions, and lettering; standard elements and symbols which make up working drawings used in Industry. The theory of shape and its representation in orthographic projections, section, auxiliary views, revolutions, and size descriptions. Isometric drawings and the translation of orthographic views into pictorial drawings. (2F, W, S) Preator and Shaw

94. Working Drawings and Specifications. An introduction to architectural drawings and specifications as applied to building and construction problems. Scale drawings including plans, elevations, sections and construction details are completed with tracings and prints. Prerequisites: 91, 92, 93. (3W) Shaw

95. Machine Drawing. Problems pertaining to machinery drives and fastenings, mechanisms of power and motion and the design of machine parts incorporating standardized methods consistent with industry. Prerequisites: 91, 92, 93. (3W) Preator

194. Mechanical Perspective. Practical problems in angular, parallel and oblique perspective. Techniques in rendering finished drawings. Prerequisite: 94 or 95. (Taught alternate years with M.D. 195) (3S) Shaw
195. Industrial Production Illustration. Translation of working drawings into dimetric and trimetric projections, exploded views, and assemblies as a means of rendering industrial illustration. Prerequisite: 94 or 95. (3S)

196. Aircraft Drawing. Problems common to aircraft work are used. Special aircraft techniques, numbering systems, change methods, and technical specifications are stressed. Prerequisite: 95. (3S)

FORGE PRACTICE
J. Donald Wadsworth, Instructor

The Forge Practice Unit of the Department of Metalwork and Mechanical Drawing provides general service courses for the various departments on the campus. These courses are in forging, bench metalwork, and ornamental iron work. They are open to all college students.

The Forging Laboratory is equipped with hand tools, shop equipment, and necessary materials for complete work in this field.

Forging is basic to the metal working trades and industries. Its fundamental operations are practiced in fabrication and construction work, maintenance and repair work, and in many forms of manufacturing. Students in Engineering, Technology, Agriculture, and many related fields will profit by basic training in forge practice.

Description of Courses

11. Forging and Bench Metal Work. (For Engineering and Agricultural students.) Fundamental operations of forging, such as shaping, benching, forge welding, hardening, and tempering. Use of tools and the fundamental bench operations. Two labs. (2F, W or S) Wadsworth

31, 82, 83. Forge Practice. Fundamental operations of forging, such as shaping, bending, drilling, hardening, tempering and forge welding. Prepares students for forging jobs in repair shops, construction camps, and industrial maintenance shops. Excellent training for acetylene and electric welders and other metal workers entering present-day industries. Five credits each course. Part of these courses may be taken any one quarter: 81a, first two, or 81b, first three credits; and 81c, last three, or 81d, last two credits of the course. (5F, W, S) Wadsworth

84. Ornamental Iron Work. Designing and making of iron furnishings, fences, gates, frilles, jardinières, sign brackets, etc. This course is particularly designed for students in Industrial Arts, Farm Mechanics, and Landscape Architecture and Planning. Prerequisite: Forging 81a. Three labs. (2S) Wadsworth

WELDING
A. B. Kemp, Rawson Child, Instructors.

The Welding Unit of the Department of Metalwork and Mechanical Drawing offers progressive instruction in Oxy-Acetylene and Electric-Arc Welding. General service courses are provided for those students wishing a fundamental knowledge of this modern field of industry. Completion of the four-year curriculum leads to the degree of Bachelor of Science in Industrial Technology. This program combines a technical program with a broad general education and prepares students to enter industry as skilled technicians, sales engineers, or to enter the welding business for themselves. A two-year Vocational Technical program is available for students preparing to enter the industry as skilled workers.

Modern industry is teeming with opportunities to apply welding to design, processes, materials, machinery and devices. Welding will play a large part in providing food, clothing, shelter, power, and transportation for future civilization. The extent of this development will depend upon the training and preparation of today's youth for tomorrow's industry.
CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Welding Technology

Freshman

Course | F | W | S
--- | --- | --- | ---
Welding 41, 42, 43 | 5 | 5 | 5
Welding 41a, 42a, 43a | 5 | 5 | 5
English 17, 18, 19 | 3 | 3 | 3
Metalwork 51a | — | 2 | —
Mech. Dwg. 91, 92, 93 | 2 | 2 | 2
M.S. 1, 2, 3 | 1 | 1 | 1

Sophomore

Course | F | W | S
--- | --- | --- | ---
Welding 44, 45, 46 | 5 | 5 | 5
Welding 44a, 45a, 46a | 5 | 5 | 5
Math. 34, 35, 44 | 3 | 5 | 3
M.S. 4, 5, 6 | 1 | 1 | 1
Electives | — | 3 | 2

Junior

Course | F | W | S
--- | --- | --- | ---
Physics 20, 21, 22 | 5 | 5 | 5
Chemistry 10 | 5 | — | —
Math. 97, 98, 99 | 5 | 5 | 5
Zoology 11 | — | 4 | —
Psychology 53 | — | 5 | —
Ag. Econ. 53a, b | 3 | 3 | —
Electives | — | 3 | —

Senior

Course | F | W | S
--- | --- | --- | ---
Welding 190, 191, 193 | 3 | 3 | 3
C.E. 101, 102, 103 | — | 4 | 4
C.E. 192 | — | 3 | —
English 111 | — | 4 | —
Bus. Admin. 100 | — | 3 | —
M.W. 150 | — | 3 | —
Electives | — | 3 | 5

Electives | — | 3 | —

Two-Year Vocational Technical Program
Technical Certificate in Welding

First Year

Course | F | W | S
--- | --- | --- | ---
Welding 41, 42, 43 | 5 | 5 | 5
Welding 41a, 42a, 43a | 5 | 5 | 5
W.W. 6 | 3 | — | —
Forge Prac. 81a, 84 | 2 | — | 3
Mech. Dwg. 91, 92 | 2 | 2 | —
Econ. 27 | — | 2 | —
Psychology 33 | — | 3 | —
Electives | — | 3 | —

Second Year

Course | F | W | S
--- | --- | --- | ---
Welding 44, 45, 46 | 5 | 5 | 5
Welding 44a, 45a, 46a | 5 | 5 | 5
English 17, 18, 19 | 3 | 3 | 3
M.W. 51a | — | 2 | —
Forging 11 | — | 2 | —
Ind. Ed. 40, 21 | 2 | 3 | —
Auto 52, 53 | 3 | 3 | —

Electives | — | 3 | —

Description of 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, 41a. Acetylene Steel Welding. (Technical and Shop.) Training in fusion welding and cutting of mild steel by means of oxy-acetylene welding equipment. (Tech. 5; Shop 5; F) Kemp

*42, 42a. Acetylene Cast-Iron Welding. (Technical and Shop.) Training in fusion welding and brazing of cast iron and bronze welding of malleable casting with oxy-acetylene flame. Special problems in the pre-heating of castings are introduced. (Tech. 5; Shop 5; W) Kemp

*43, 43a. Acetylene Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, stainless steel, miscellaneous alloys, and non-ferrous metals with oxy-acetylene and Heli-arc welding equipment. Attention is given to pipe welding, hard surfacing and flame hardening. (Tech. 5; Shop 5; W) Kemp
*44. Electric Steel Welding. Training in fusion welding of mild steel by means of electric-arc welding equipment. (Tech. 5; Shop 5; F) Kemp

*45. Electric Cast-Iron Welding. (Technical and Shop.) Training in fusion welding of bronze, cast-iron and malleable castings with the electric-arc. (Tech. 5; Shop 5; W) Kemp

46. Electric Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, stainless steel, and non-ferrous metals with the electric-arc. Attention is also given pipe welding and hard surfacing. (Tech. 5; Shop 5; S) Kemp

91. Acetylene Welding. Principles and practice in the fundamentals of oxy-acetylene welding and cutting. A general course open to all college students. Two lectures, two 2-hr. labs. (3F, W or S) Child

92. Aero Welding. Principles and practice in welding steel and alloy steel tubing as practiced in aircraft construction and repair. Attention will be given to resistance welding. Two lectures, two 2-hr. labs. (3F) Staff

93. Advanced Aero Welding. Open only to advanced students in aircraft welding and provides instruction pertinent to qualifying for CAA Aircraft Mechanic License. Prerequisite: 92. Two lectures, two 2-hr. labs. (3W) Staff

94. Electric Welding. Principles and practice in the use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc-welding of steels. Two lectures, two 2-hr. labs. (3F, W or S) Child

96. Engineers Welding Laboratory. Exploration in modern welding. Students receive basic instruction and practice in the use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. Two 3-hr. labs. (2F, W or S) Child

190. Advanced Acetylene Welding. Principles and practice in welding metallurgy pertaining to acetylene welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hard-surfacing and flame hardening. Laboratory welding in vertical and overhead positions, and testing welds by means of the tensile hardness, etching, and microscope. Two lectures, two 2-hr. labs. (3F) Kemp

191. Advanced Electric Welding. Principles and practice in welding metallurgy pertaining to electric welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hard-surfacing, and flame hardening. Laboratory welding in vertical and overhead positions and testing welds by means of the tensile hardness, etching, and microscope. Two lectures, two 2-hr. labs. (3W) Kemp

193. Welding Seminar. Current topics in production methods, cost, design, and manufacture of welded products as used in modern industry. (2S) Kemp

Radio and Electronics

Larry S. Cole, Clayton Clark, Associate Professors; William L. Jones, Assistant Professor.

This department offers a standard four year curriculum leading to the Bachelor of Science Degree in Radio and Electronics. The objective of this course is to provide students with sufficient theoretical and practical background to enable them, as graduates, to occupy responsible technical positions in the various branches of the radio industry, including broadcasting, manufacturing and general electronics; communications generally and the various civil service positions in the field.

*For students majoring in welding only.
The unusual growth and development in these fields has created an increasing demand for men who are adequately prepared. Past graduates of this department have found excellent employment opportunities and positions. The department maintains contacts with broadcast stations, radio manufacturers, laboratories and civil service agencies to give valuable employment assistance to graduates.

Complete laboratory facilities and modern testing and measuring equipment are available to carry out an extensive laboratory program and give the student ample practice and experience during his training. Special items include broadcast studio facilities with control, monitor and recording equipment; radio transmitters to 1000 watts, commercial and composite types; communication receivers; complete radar sets and other UHF equipment; an adequate stock of parts, tubes and supplies for instructional and experimental work.

**CURRICULUM**

Degree: Bachelor of Science in Radio and Electronics

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**Description of Courses**

21. **Fundamentals of Electricity.** A course especially designed for students majoring in Industrial Arts, Automotive, Refrigeration, Welding, etc., covering basic principles of practical and applied electricity. Principles of Electricity; D.C. and A.C. circuits; power; wire and wiring; motor, generator, and transformer principles; batteries; electrical measurement. Four lectures. (4F, W or S)  

**Staff**  

23. **Basic Electricity.** (For Communications.) Introduction to the fundamentals of electricity; direct and alternating current circuits and circuit components; magnetism; motors, generators, and batteries; elements of electron tubes. Five lectures. (SS)  

**Jones**  

24. **Radio Mechanics.** A laboratory course including soldering, wiring and use of schematic diagrams; construction of basic type units; measurements in electric circuits. Two labs. (2S)  

**Staff**

1—Students deficient in high school algebra (b) and solid geometry will also be required to take Math. 33 and 34.  
2—Shop includes metalwork, welding, woodwork.  
3—Students not planning graduate study may substitute other approved courses for C.E. 196, 101, 102, 103.
31. 32. 33. Code Practice. These courses will train the beginner to send and receive correctly 15 to 20 words per minute. The actual speed attained will depend on individual ability. Optional, but recommended for all radio majors. (1F, W, S) Staff

80. Direct Current Circuits. Applications of Ohm's Law, Kirchhoff's laws and network theorems to the solution of simple and complex resistive circuits; L-R and C-R circuit analysis; resistive matching networks; magnetic and electric fields and circuits. Five lectures. (5F) Staff

81. Alternating Current Circuits. Fundamentals of alternating currents; application of vector algebra to the solution of AC circuits; application of network theorems to AC circuit problems; resonant circuits; introduction to reactive matching networks; elements of complex wave analysis. Prerequisite: RA 80. Five lectures. (5F) Jones

82. Electron Tubes. Fundamentals of thermionic emission and operation of vacuum and gas filled tubes; basic principles of electron tube circuits and methods of analysis; applications of electron tubes in radio equipment; measurements and testing in electronic circuits; power supplies. Prerequisite: RA 80. Three lectures, two labs. (5S) Staff

110. Communication Circuits. Principles and characteristics of transmission lines, networks, matching sections and filters used in communication systems. Prerequisite: RA 81. Four lectures, one lab. (5S) Cole

120. Antennas. Fundamentals of radio antennas, radiation and wave propagation: adjustment and construction of all types of antennas; directional arrays; feeder lines and matching networks; antenna and field strength measurements. Prerequisite: RA 110. Three lectures, two labs. (5F) Clark

125. Audio Frequency Amplification. Principles, characteristics, and construction of resistance, impedance, and transformer coupled audio amplifiers; audio circuit constants and measurements; Class A, AB and B power amplifiers. Prerequisite: RA 82. Three lectures, two labs. (5F) Cole

126. Radio Frequency Amplification. Principles, characteristics, and construction of R.F. voltage and power amplifiers; neutralization and adjustments; modulation; R.F. circuit constants; oscillators and detectors. Prerequisite: RA 82. Three lectures, two labs. (5F) Clark


140. UHF Circuits. Complex wave analysis; wide band amplifiers; square wave testing; voltage regulation; special transmission networks for UHF modulating signals; measurements with cathode ray oscilloscopes; application of transmission line theory in the UHF spectrum. Prerequisites: RA 120, 126. Three lectures, two labs. (5F) Clark

141. UHF Techniques. UHF generators: cavity resonators; wave guides; parabolic and horn radiators; applications of UHF to radar and other complete systems. Laboratory facilities include a new and complete Mark 16 navy radar in the 10 cm region. Prerequisite: RA 140. Three lectures, two labs. (5W) Clark

142. Television and F.M. Systems. A resume of the elements of present television and F.M. transmitter and receiver systems; facsimile and teletype systems. Three lectures. (3S) Clark

150. Instruments and Measurements. A laboratory course covering the principles, application and use of electrical and electronic instruments: methods and techniques of measurements. Prerequisite: RA 82. Two labs. (2F, W or S) Cole, Clark

151, 152, 153. Advanced Laboratory. Advanced radio laboratory work in construction of communication units and special equipment; measurements, testing and laboratory techniques. Prerequisite: RA 125, 126, 150. Two labs. (2F, W, S) Staff
160. Industrial Electronics. The application of electronic methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms; R. F. heating. Prerequisites: RA 125, 126. Two lectures, one lab. (3S)

175, 178, 177. Radio Seminar. A weekly meeting of staff and senior Radio majors. Reports and discussions on recent developments in the fields of communications and electronics. (1F, W, S)

Woodwork and Building Construction

D. A. Swenson, Professor Emeritus; Joseph Coulam, William E. Mortimer, Professors; Charles N. Merkley, Associate Professor; Ross A. Nyman, Dan H. Swenson, Instructors.

This department offers work in joinery and millwork, building construction, estimating and contracting, pattern making, wood turning, wood finishing, home mechanics, and cabinet work. It offers a curriculum leading to the degree of Bachelor of Science in Industrial Technology with a major in Building Construction; and general service courses that may be used toward satisfying the curriculum in Industrial Arts.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Building Construction

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<td>Woodwork 61, 62, 63</td>
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<td>Radio 21</td>
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<td>Woodwork 68</td>
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<td>18 19 18</td>
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Two-Year Vocational Technical Program

Technical Certificate in Carpentry

<table>
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<th>First Year</th>
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<th>Final Year</th>
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<td>M. D. 91, 92, 93</td>
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</table>
Description of Courses

Courses W.W. 61, 62, 63, 74, 160, 171, 172, 173 may be completed by taking part of the course during one quarter and the other part during a later quarter. The letters a, b, c, d are used to designate the subdivision of these courses. Thus, a represents the first two credits of the course; b, the first three credits; c, the last three credits, and d, the last two credits. The three courses are offered 9-12 M. W. F. each quarter, and the two-hour courses are offered 8-11 T.Th. each quarter.

6. Shop Problems. Use is made of simple mathematical formula 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, W or S) Coulam and Nyman

60. Elements of Plumbing. Includes plumbing specifications, codes, layouts, inspections, cutting and fitting pipe, and repairs. One lecture, one lab. (2W) Swenson and Nyman

61. 62. 63. Joinery and Millwork. Basic training for students preparing to enter the woodworking trades, and those who wish a general knowledge of woodwork. Includes a study of the proper use, care and sharpening of hand tools, machine processes, safety measures, machine operation, care and repair of machines, and sharpening of machine cutters. Assigned reading and application of mathematics to woodworking problems. Projects in bench work and wood turning to give practice in the fundamentals of wood construction. Five labs. (2, 3 or 5F; 2, 3 or 5W; 2, 3 or 5S) Swenson and Nyman

64. 65. 66. Building Construction. Laying out and construction of 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: W.W. 63. (5F, W or S) Merkle

67. Woodwork for Engineers. Fundamental operations of woodworking. Includes the use, care and sharpening of hand tools and power woodworking equipment, shop safety, lumber grading and its use, reading and use of the steel square. Also wood construction engineering, two or three labs. (2F, W or S) Swenson and Nyman

68. House Wiring. For students in building construction courses. Covers the national electrical code and the local codes in Utah communities. Includes the 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) Staff

72. Concrete and Clay Products. Composition of concrete for various purposes, the use and placement of reinforcing agents; waterproofing, coloring, and stone imitation, etc. Composition of bricks, tile, etc., and their strength and thermal conductivity are also studied. Projects are built in the laboratory during the course. One lecture, one lab. (2W) Merkle

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 the building trades. Three lectures. (3S) Merkle and Mortimer

4. Home Service Course. Upkeep and general repairs in the home, such as frequently are needed on electrical, plumbing, and other home equipment. Woodwork repairs and furniture refinishing as well as fitting of window blinds and screens, calking and wallpaper cleaning will receive attention. Minor repairs to heating, ventilating and refrigeration equipment will also be considered. Open to men and women students. Prerequisite: High school physics or equivalent. Five labs. (2-5 F, W or S) Swenson

160. Pattern Making. Essentials of pattern making. Simple patterns illustrating construction and choice of materials, principles of shrinkage, etc. Prerequisite: W.W. 61. Five labs. (5F, W or S) Swenson

161, 162, 163. 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, specifica-
tion 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. Prerequisite: W.W. 66, Mech. Dwg. 94. Three lectures, two labs. (5F, W, S)*

70 or 170. Wood Finishing and House Decorating. Fine wood finishing such as natural finishes, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, stucco paints, etc. Students are required to do practice work in each type of finishing. One lecture, one lab. (2F, W or S)

171, 172, 173. Cabinet Work. The design and construction of furniture and cabinets, including a study of the woods suitable for furniture and cabinet making, wood turning, inlaying, and types of wood finishings. Projects are built which include inlaying and overlaying. Prerequisite: W.W. 63. All lab. (5F, W, S)

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: W.W. 63. Two 3-hour labs. (3F)

*Where requirements for the lab. are met under another course, 3 credits for lecture only.
SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT
LEWIS M. TURNER, Dean

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General Information

The favorable geographical location of this School of Forest, Range, and Wildlife Management, the opportunity for self help for qualified men and great need for better management of the forest, range and game, provide an excellent combination of circumstances and opportunities for proper training in the management of wild lands and their resources.

Naturally-vegetated lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range, and soil conservation problems; all offer study projects and opportunities for demonstration. Herds of elk and deer come within a short distance of the campus during the winter.

The Wildlife Management department is greatly enhanced through the establishment of a research agency of the U. S. Fish and Wildlife Service on the campus, which is housed in the forestry building. One of the Federal Wildlife Research Units, a cooperative project with the college, the Utah Fish and Game Department, the U. S. Fish and Wildlife Service, and the American Wildlife Institute is located here under the leadership of Dr. J. B. Lew. Representatives of this agency assist in class and laboratory instruction, and aid in directing research of graduate students. Graduate fellowships in Wildlife Management have been made available through the Wildlife Research Unit.

The comparative newness of the fields of forestry, range, wildlife, soil conservation, watershed management, and forest recreation, and the unquestioned need for their correlation in permanent wild land management, present excellent opportunities for those desiring to participate in these fields of public service. The purpose stressed is the handling of wild lands so that they may be of continuing benefit for the present and future generations of citizens.

RECOMMENDED ENTRANCE QUALIFICATIONS

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. If the student, for example, has not had high school algebra, he will be required to make up that deficiency in college. It is, therefore, recommended that these basic mathematics and science courses be taken in high school.

COURSES OF STUDY

The curricula of this school are designed to train men for private, federal government or state work in (1) Forest Management, (2) Range Management, and (3) Wildlife Management. Forest management majors may choose between two options; one designed to train for general forestry work in the West, and one for strict timber management. The range majors may choose, in the junior year, to specialize in soil conservation and watershed management. Wildlife management majors may select a course to train for general administrative work with big game and related problems, or a course in general wildlife management with considerable emphasis on small game or a course in fishery management.

FIVE-YEAR COURSE RECOMMENDED

The efficient management of wild land resources in all its phases requires a broad fundamental knowledge of many of the sciences and arts. For this reason, many of the forest schools throughout the nation have recognized that the usual four-year program of study is inadequate to give the student sufficient training in both the basic sciences and in the technical subjects of the chosen field. It is therefore recommended that a five-year course of study be pursued.

1—For more detailed information request a copy of the School of Forest, Range, and Wildlife Management bulletin from the Dean of that school.
The first two years of the regular four-year course of study are practically the same in all departments, with specialization in a major field beginning in the third or junior year. This program gives the student only a minimum of basic training and cultural foundation. The five-year program provides for an additional year devoted principally to general training in supporting arts and sciences. This furnishes a better foundation for the technical studies of the last two years and a superior cultural background which is so necessary for advancement in public service.

SUMMER CAMP

The School of Forest, Range, and Wildlife Management has purchased and leased 3,000 acres of forest and range land approximately 22 miles from the campus within the Cache National Forest, where summer camp 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 field experience with a recognized conservation agency is expected of all students.

Attendance at the camp is required between the sophomore and junior years. The summer camp opens soon after the close of the spring quarter and continues for a period of 11 weeks. Fifteen credits are allowed for the complete course. In addition to the regular summer school fees, a $5.00 fee is charged for each of the five courses, and board is provided on a cost basis. Students attending camp must be inoculated for Rocky Mountain spotted fever. All junior college students planning on entering this school at the beginning of their junior year, should make arrangements to attend the camp during the summer following their graduation from the junior college. To be eligible to attend camp however, the requirements of the freshman and sophomore year as outlined on page 220 essentially must be fulfilled. Successful completion of the summer camp courses will be prerequisite to the professional course work of the junior year.

FIELD TRIPS

A schedule of field trips is planned each year as a part of the regular class instruction. In addition to short trips, scheduled for the individual courses, each department conducts an extensive field problems trip in the spring quarter, covering all branches of the major field. This trip is required of all seniors prior to graduation. The trip for wildlife majors is usually scheduled over the first week of May, and range majors over the second or third week. The trip for forestry majors is more extensive and covers a period of ten days or two weeks just prior to the end of the spring quarter. Each student pays his share of the cost of the trip. A fee of about $35.00 is charged each student to defray the general expenses of the trip.

SCHOLARSHIP

A high standard of scholarship must be maintained by the student enrolled in forestry or the associated fields because of the technical nature of the work, and the high professional standards, and the character of the Civil Service examinations that are required for federal service. A student is required to maintain a C or better average to remain in the school.

GENERAL REQUIREMENTS

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management:

A. At least 207 credits (quarter hours) exclusive of basic Military Science and Physical Education.
B. Fifteen of the 207 credits must be earned at Summer Camp.
C. All courses prescribed under the study program of the chosen major.
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—8 quarters.
BASIC COURSES

Required of all students majoring in the School of Forest, Range, and Wildlife Management.

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<thead>
<tr>
<th>Course</th>
<th>Freshman</th>
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<td>Speech 5</td>
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<td>Animal Husbandry 1</td>
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<td>Animal Husbandry 2</td>
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<td>Civil Engineering 60</td>
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SUMMER CAMPS

Required courses at summer camp:

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<td>Forestry Surveying</td>
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<td>Range Management 98</td>
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<td>Wildlife Practice</td>
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</tbody>
</table>

Forest Management

J. W. Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; C. M. Bowen, Associate Professor; R. R. Moore, Assistant Professor.

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 forestry, including growing, protecting, harvesting and utilization of timber crops. Two courses are offered by this department. It is desirable that the student know by the end of the his sophomore year which course he will follow. The option in general forestry provides adequate training in timber management, and in addition some training is provided in range management, wildlife management, and recreation and watershed management. This type of curriculum is better adapted to the needs of the personnel of the public land managing agencies in the Intermountain region and, in fact, throughout most of the western states. The second option is timber management. This course provides major emphasis on the growing, harvesting, and utilizing of timber crops.

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 secure employment with such agencies as the Forest Service, Park Service, or comparable state agency, or in private forest industries. The school maintains an employment service to aid students in securing such summer work.

Electives: Electives necessary to fill out the program of the Junior College years should be chosen with the object of improving the students' 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 major professor.

1—Not required of ex-military personnel.
2—Students presenting 1½ units of high school algebra or otherwise qualified to take Math. 34 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.
The degree of Master of Science in Forest Management will be given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. Normally the student will be required to take all of the forestry courses in the two hundred series (See Description of Courses.) One to two years may be required depending on the ability of the student, the adequacy of his background, and his thesis problem. Students will be considered for candidacy for the M.S. degree in forest management if they have the Bachelors degree. Applicants should submit an official transcript of their college courses.

Two teaching assistantships are available to graduate students in Forest management.

**FOREST MANAGEMENT**

**Freshman and Sophomore Years — See Basic Courses**

**A. General Forestry**

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<td>Dendrology I, II</td>
<td>F 112</td>
<td>W 113</td>
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<tr>
<td>Silviculture I, II</td>
<td>F 114</td>
<td>W 115</td>
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<tr>
<td>Forest Protection I</td>
<td>F 118</td>
<td>W 119</td>
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<td>S 3</td>
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<tr>
<td>Forest Protection II</td>
<td>F 132</td>
<td>W 119</td>
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<tr>
<td>Public Land Administration</td>
<td>F 126</td>
<td>W 122</td>
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<tr>
<td>Range Management</td>
<td>F 162</td>
<td>W 112</td>
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<tr>
<td>General Wildlife Management</td>
<td>F 150</td>
<td>W 112</td>
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**Senior Year**

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<tr>
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<td>F 121</td>
<td>W 122</td>
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<tr>
<td>Forest Finance</td>
<td>F 126</td>
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<tr>
<td>Wood Technology</td>
<td>F 133</td>
<td>W 122</td>
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<tr>
<td>Forest Policy and Economics</td>
<td>F 137</td>
<td>W 122</td>
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<tr>
<td>Improvements and Recreation</td>
<td>F 142</td>
<td>W 122</td>
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<tr>
<td>Forest Seminar</td>
<td>F 176</td>
<td>W 122</td>
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<tr>
<td>Range Forage</td>
<td>F 180</td>
<td>W 122</td>
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<tr>
<td>*Range Forage Plants</td>
<td>F 112</td>
<td>W 122</td>
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<tr>
<td>Senior Field Problems</td>
<td>F 146</td>
<td>W 122</td>
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**B. Timber Management**

Students who choose the timber management option will substitute the following courses for those marked (*) above:

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<tbody>
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<tr>
<td>Logging</td>
<td>F 125</td>
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<td>S 3</td>
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<tr>
<td>Mechanical Properties</td>
<td>F 129</td>
<td>W 122</td>
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<td></td>
<td>S 3</td>
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<tr>
<td>Milling and Products</td>
<td>F 130</td>
<td>W 122</td>
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<tr>
<td>Forest Entomology</td>
<td>F 105</td>
<td>W 122</td>
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<tr>
<td>Forest Pathology</td>
<td>F 140</td>
<td>W 122</td>
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</table>

Recommended electives for the general forestry option are Forestry 130, and for the timber management option, Forestry 117, Accounting 133, and Woodwork and Construction 67.

**Description of Courses**

1. **General Forestry.** A general survey of the profession of forest management, range management, soil conservation, recreation and wildlife management;  

---English 111 may be substituted for English 112.
character of the work; and relation of multiple uses of wild land to the welfare of the state and the nation. (3F and 5)  

10. Forest and Range Conservation. An 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. Not open to School of Forestry majors. (2W)  

11. Winter Woodcraft. Lectures and field trips are designed to train the student in the proper way of living in the wilderness. Prerequisite: ability to ski. The student must furnish ski boots and suitable outdoor clothing. Lecture, field trips. (3W)  

90. Forest Improvements. Practical field problems in trail and telephone construction, the use of field radios, methods of fire prevention, detection and suppression. Care and use of woods, tools and horses in forest, range, and wildlife work. Problems in construction, planning recreational areas and water development. Interpretation of forest and range soils. Lab. fee $5.00. Summer Camp. (3)  

96. Forest Surveying. Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Type mapping. Lab. fee $5.00. Summer Camp. (3)  

97. Forest Practice. Study of timber types and successional stages. Timber cruising, log scaling, inventories and growth of immature stands, stem analysis, taper measurements, sample plots, milling and utilization studies. Lab. fee $5.00. Summer Camp. (3)  

101. Forest Survey I. Identification and range of the major commercial species of the United States. Elementary principles of silviculture and forest management. Not open to students in Forest Management. (3F)  

102. Forest Survey II. Forest improvement and recreation; log scaling, timber cruising, study of growth and yield; logging, milling, and seasoning of lumber. Some attention will also be given to identification, properties and uses of the major commercial woods of the United States and to the major wood products. Not open to students in Forest Management. (3W)  

106. Forest Measurements I. Measurements of timber in the log, the tree, and the stand. Log rules and volume tables. Timber cruising practices. Prerequisite, summer camp. (4W)  

107. Forest Measurement 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. (4S)  

112. Dendrology I. Hardwoods. Identification, distribution, and silvics of the more important forest trees in the U. S. (3F)  

113. Dendrology II. Conifers. Identification, distribution and silvics of the more important forest trees in the U. S. (2W)  

114. Silviculture I. Characteristics of the tree species which influence the silviculture practice in the United States. Prerequisites: Range 125 and Botany 120. (3W)  

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)  

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. (2S)  

117. Advanced Silvics and Silviculture. Growth, transpiration. Intensive study of a few major forest types. Prerequisite: For. 115. (3S)  

118. Forest Protection I. Prevention, presuppression and suppression of forest and range fires. Economics and physical effects. (3F)  

119. Forest Protection II. Problems of administration and economics in protecting forests from biological enemies. (3S)  

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: For 106, 107, 115. (4F)
122. **Forest Finance.** Financial aspects of forest management, such as land, growing stock and stumpage valuation, forest taxation and damage appraisal. Prerequisite: For. 121. (4W) Moore

125. **Logging.** Methods of handling timber from tree to mill in the various forest region. (3F) Moore

126. **Wood Technology.** Structure and identification of the economic woods of the United States. (3F) Bowen

129. **Mechanical Properties.** A study of the factors affecting the strength of wood. (2W) Bowen

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

132. **Public Land Administration.** History, organization and functions of conservation agencies affecting range, forest and wildlife administration. (3W) Floyd

133. **Forest Policy and Economics.** Development of Federal State and private forest policy. Economic problems in the production, distribution and consumption of forest products. (3W) Floyd

137. **Improvements and Recreation.** Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and development of areas suitable for this purpose. (3S) Floyd

138. **Recreational Planning.** Mapping and designing plans for the various forms of forest recreational use. (3S) Floyd

142. **Forestry Seminar.** Review and discussion of current forestry problems and practices. (2W) Moore

145. **Forest Problems.** Individual study and research upon a selected forestry problem approved by the instructor. (1-3 F, W or S) Staff

146. **Senior Field Problems.** Study of forest operations. (1S) Senior year. Fee, $35.00. Staff

201, 202, 203. **Advanced Forestry Seminar.** Review and discussion of more advanced current literature. For students in the graduate school. (1F 1W 1S) Turner

204. **Forest Ecology.** Study of the historical and present distribution of forest species and forest types and the physical-biological basis of distribution. (3W) Turner

205. **Silviculture.** Advanced treatment of silvics and silviculture with emphasis on the physiological aspects of the subjects. (3W) Daniel

206. **Forest Management.** Application of forest management principles; forest organization and development; forest regulation and sustained yield; management principles and control of operations. (2F) Moore

207. **Forest Finance.** Economic principles which control forestry enterprises; capital value of forest properties; cost of production in forest enterprises; determination of rate of profit; principles of appraising damages; stumpage valuation and forest taxation and insurance. (2W) Moore

208. **Forest Measurements.** Application of statistical measurements to forest problems. (3F) Bowen

209. **Forest Economics.** Study of economics of a private forest enterprise, including the economics of production, manufacture and marketing. (3F) Floyd

210. **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

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**Range Management**

L. A. Stoddart, Professor and Head of Department; Arthur D. Smith, Associate Professor; C. Wayne Cook, Max E. Robinson, Assistant Professors.

The course in range management acquaints the student with methods of maintaining the production of native lands and methods of managing range
livestock. An opportunity is given to take special instruction in soil conservation and watershed management.

The degree of Master of Science in Range Management will be granted upon completion of an arranged course of study. Students desiring this advanced work should obtain permission from the major professor at least twelve months before the degree is to be granted, at which time a program of research and study will be outlined. Adequate facilities are available to allow emphasis upon soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in range management or a related subject is prerequisite.

Several assistantships are available annually for students doing graduate work in range management. For information concerning these, prospective students should consult the department head.

COURSE OF STUDY

Freshman and Sophomore

Students majoring in range management will take the freshman and sophomore study program as outlined for the School of Forestry (page 220).

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<td>Forbs and Browse</td>
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<td>Poisonous Plants</td>
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<td>Senior Field Problems</td>
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Suggested Electives

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<td>W. L. 155</td>
<td>Economic Wildlife</td>
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<td>Forest Protection</td>
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<td>Forage Crops</td>
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<td>Vet. Sci. 120</td>
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<td>Bot. 121</td>
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<td>Adv. Physical Geology</td>
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MAJOR—SOIL CONSERVATION AND WATERSHED MANAGEMENT

A major in soil conservation and watershed management is allowed with substitution of the following courses for those marked (*) above and for A.H. 10 in the Sophomore year.

1—English 111 may be substituted for English 112.
<table>
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<tr>
<th>Course Code</th>
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<td>Agronomy 125</td>
<td>Soil Conservation</td>
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<td>Geology 115</td>
<td>Advanced Physical Geology</td>
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<tr>
<td>C. Eng. 171</td>
<td>Hydrology</td>
<td>-</td>
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<tr>
<td>Range 176</td>
<td>Range Forage Plants</td>
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<td>Botany 121</td>
<td>Water Relations of Native Plants</td>
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<tr>
<td>Agronomy 114</td>
<td>Soil Survey and Land Classification</td>
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<tr>
<td>Agronomy 155</td>
<td>Soil and Plant Relations</td>
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</table>

**MINOR—RANGE MANAGEMENT**

The following courses are suggested for students wishing to minor in Range Management. The requirements are subject to change upon approval of the department head.

- **Range Practice.** Field work in range management involving training in making range reconnaissance, estimating utilization, conducting technical range research, range improvement and management planning. Lab fee $5.00. Summer camp. (3) Smith and Robinson
- **Plant Ecology.** An analysis of habitat factors as they influence plant growth and distribution. Attention will be given to plant succession and competition and to detailed methods of studying and mapping vegetation. Prerequisite: Botany 30; Agronomy 55 or 58. (SF or S) Stoddart
- **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. Prerequisite: Botany 25 or Botany 12. Four lectures, one lab. (5S) Cook
- **Range Management.** A technical course dealing with problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisites: Botany 30 and Range 98. (SF or S) Cook and Robinson
- **Advanced Range.** Technical problems in range management. Prerequisites: Range 126 and 162. (3W) Stoddart
- **Range Forage Plants.** Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Prerequisite: Botany 30. (4W) Cook
- **Forbs and Browse.** A study of forbs and browse including identification, region of growth, habitat, and forage value. Prerequisite: Botany 30. (2F) Cook
- **Poisonous Plants.** A study of important poisonous plants, including general methods of livestock handling and range management practices, identification, region of growth, habitat, poisoning symptoms, remedies and control measures. Prerequisite: Botany 30. One lecture, one lab. (2S) Cook
- **Watershed Management.** The study of floods, soil erosion and runoff on range and forest lands, the effects of vegetation in equalizing runoff and preventing erosion and methods of rehabilitating damaged watersheds. Prerequisite: Range 129. (4F) Smith
- **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 162. (3W) Smith
- **Range Seminar.** A systematic review of the field of range management and related fields. Prerequisite: Range 162. (1F, 1W, 1S) Staff
Wildlife Management

G. H. Kelker, Professor and Head of Department; I. B. Low, Professor and Biologist, U. S. Fish and Wildlife Service; W. F. Sigler, Assistant Professor.

Upon completion of the basic courses and the upper division requirements as outlined in the study program, students are granted the degree of Bachelor of Science, major in Wildlife Management. The basic courses of the freshman and sophomore years are tabulated on page 220. Prospective wildlife management majors should elect Zoology 3, 4, and 13 in the sophomore year.

The course work of the junior year provides comprehensive basic training in general wildlife management. Those having an interest in a particular field may 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 furbearers, considers representative areas of the United States for illustrative purposes in the management of each game bird or mammal. Attention is given to game farm procedures. The fisheries option considers the production of both cold water and warm water fishes in relation to local land uses. Land utilization often affects seriously the water habitant. Thus training is given in survey work of the water and the land from which it drains. In addition to the general training, the student participates in creel censuses, measuring the growth rate and productivity of fish in inland waters, and in various forms of habitat improvement.

Any one of these 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 as listed by the Graduate School, a Master of Science degree in Wildlife Management is given. A period of one to two years, depending upon the thesis problem and the amount of time which the student can devote to his studies, is necessary to complete all requirements for the degree. Subjects for thesis work are largely confined to problems dealing with economic status of those species closely related to the management of forests, ranges, or farmlands. Prerequisite to graduate work is a bachelor's degree in Wildlife Management, Forestry, Range Management or a related field.

The cooperation of the Fish and Wildlife Service of the U. S. Department of Interior, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the cooperatively sponsored Wildlife Research Units was established at Utah State Agricultural College in 1935.

Wildlife Research Unit funds are available for four or more graduate research fellowships for students working toward a master's degree in this field.
Candidates for fellowships will be chosen from applicants who have a bachelor’s degree in Biology, Forestry, or Agriculture from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before April 1.

**COURSE OF STUDY**

Freshman and Sophomore — see Basic Courses for Forest, Range, and Wildlife Management, page 220.

**Wildlife Management**

List of courses required for graduation of all Wildlife Majors.

<table>
<thead>
<tr>
<th>Course</th>
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<td>Wildlife 160</td>
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<td>English 112</td>
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The student must complete all course work in any one of the three options to meet the requirements for graduation. He may choose suitable electives from the other two groups to broaden his training. Wildlife 171 is again taken by all seniors.

**A. Big Game Management:**

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<th>Course</th>
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<td>Wildlife 146</td>
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<td>Range 180</td>
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**B. Small Game and Furbearer Management:**

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**C. Fishery Management:**

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---English 111 may be substituted for English 112.
Description of Courses

99. Wildlife Practice. Lake and stream surveys and mapping for improvement purposes and for restocking; the use of census methods for big game, game birds, and rodents; cover mapping; preparation of animal skins, and study of deer and elk ranges. Summer camp. (3) Kelker and Sigler

145. Principles of Wildlife Management. A study of the properties of animal populations, including food cycles, niches, pyramids of numbers, fluctuation, tolerance, movements, and reproduction. (3F) Kelker

146. 246. Management of Upland Game. Taxonomy, life histories, distribution, environmental needs, enemies, and plans for management of game birds and small mammals. Prerequisite for W. 146; Wildlife 99 and 145. Additional work required of graduate students. (3S) Kelker

147. 247. Management of Waterfowl and Furbearers. Taxonomy, life histories, habitat requirements, economic importance, and plans for management of waterfowl and fur-bearers, especially the muskrat and beaver. Prerequisite for W. 147; Wildlife 99 and 145. Additional work required of graduate students. (5S) Kelker

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. (5F or S) Kelker

153. 253. Management of Big Game. Life histories, distribution, numerical variation, enemies, and plans for management of native big game animals. Prerequisite for Wildlife 153, 99 and 145. A term paper required of those doing graduate work. (5W) Kelker

155. Economic Wildlife. General importance of the wildlife resource; natural history, economic values and control methods for rodents and predators; identification of skulls and skins; a brief evaluation of hawks and reptiles. Particularly adapted for students in forestry, range, and agriculture. (3W) Not offered 1949-50. Kelker

157, 158, 159. Wildlife Seminar. Discussion of current developments in Wildlife management. (1F, 1W, 1S) Kelker


161. Limnology. Physical, chemical, and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisite: Bot. 30 and Zool. 13. (3F) Kelker


170. Wildlife Problems. Individual study and research upon a selected wildlife problem approved by the instructor. Prerequisite: Wildlife 172. (1-3 F, W, or S) Kelker

171. Field Problems. Study of wildlife management operations by various agencies of the Intermountain country. Fee, $30.00. (1S) Kelker

172. Problem Orientation. A discussion of needs and approach to wildlife investigations; analyzing the problem, presenting data, and drawing conclusions relative to research in wildlife management. (2W) Kelker


257. Graduate Seminar. Study of logic and the scientific method with special reference to wildlife investigations. (2F) Kelker

258. Graduate Seminar. Discussion of current investigations by class members and by representatives of state and federal agencies. (2W) Kelker
259. Graduate Seminar. Review of current literature pertaining to the completion and publication of technical papers. (2S) Sigler

263. Marsh Management. Marshland restoration and maintenance for waterfowl and aquatic furbearers; economic returns from marshlands; ecological plant succession and methods of restoration and maintenance of plant food and cover; management of public and private waterfowl shooting grounds; evaluation and control of predation and sickness; water level manipulation and controls for year-round operations of marshlands. (3S) Low

270. Advanced Wildlife Problems. Research problem chosen, the project outlined and planned, and data collected by the student qualified for investigations in Wildlife Management. (5-10 F, W or S) Staff

272. Wildlife Thesis. Analysis, presentation, and interpretation of field data for the graduate thesis. Prerequisite: Wildlife 270. (5-10 F, W or S) Staff
SCHOOL OF HOME ECONOMICS
ETHELYN O. GREAVES, Dean

General Information ........................................................................................................ 231
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Clothing, Textiles and Related Arts .......................................................................... 239
Foods and Nutrition ...................................................................................................... 241
Household Administration ......................................................................................... 243
Home Economics Education ....................................................................................... 243
General Information

All Home Economics courses are intended primarily to prepare young women for homemaking. Admission to the School of Home Economics requires completion of 15 high school units of work including the following: English, three units; algebra, one unit; social science, one unit; natural science (requiring laboratory work), one unit; elected (from the above groups and modern languages), three units.

The function of homemaking takes in all areas in Home Economics. For this reason courses are planned to prepare young women to carry the knowledge and skills of expert homemaking into various institutions of complex modern society. Accordingly, students may elect majors leading to a Bachelor Degree in the following divisions of Home Economics:

CHILD DEVELOPMENT AND PARENT EDUCATION
CLOTHING, TEXTILES AND RELATED ARTS
FOODS AND NUTRITION
HOUSEHOLD ADMINISTRATION
HOME ECONOMICS EDUCATION

The chief professional opportunities open to majors in the School of Home Economics are (1) Child Development and Parent Education: Elementary Education; Nursery Education; Education for Parenthood. (2) Foods and Nutrition: Dietetics; Research; Institutional Management; Teaching. (3) Clothing, Textiles and Related Arts; Merchandising; Management; Teaching; Costume Design; Textile Research. (4) Household Administration: Homemaking. (5) Home Economics Education: Teaching; Homemaking Extension Service.

A two-year terminal course in Home Economics subjects is offered for persons who are unable to complete a four-year course but who would profit from the pursuit of practical homemaking study.

In the first two years, students of Home Economics register for courses that will satisfy college requirements for graduation.

For the convenience of students these requirements are here summarized:

Lower Division Requirements

1. Biological Science ............................. 8-12 credits
2. Physical Science .................................. 8-12
3. Language and Arts ................................ 8-12
4. Social Science ................................... 8-12

Total ................................................. 40 credits

5. Six quarters of Physical Education.
6. Sophomore Composition (English 10 or 11).

All freshmen registering in the School of Home Economics and students transferring from junior college who do not have credit for a similar course are required to register for Home Economics Survey 10. This course deals with the orientation of the student into Home Economics and her guidance in the choice of a vocation related to this field. Open to all College women. One credit. Fall, Th. 11.

TWO-YEAR TERMINAL COURSE IN HOME ECONOMICS

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 will prepare the student for employment in specific fields.

REQUIREMENTS FOR TWO-YEAR TERMINAL COURSE

1. Complete a major of 30 credits in one or more closely related departments of the School of Home Economics.
2. Complete a minor of 15 credits related to or basic to the major field—not necessarily in the School of Home Economics.
3. Twenty-four credits in basic groups:
   a. Language ........................................ 9 credits
   b. Exact Science .................................. 5
   c. Biological Science .............................. 5
   d. Social Science ................................ 5
4. Electives—21 credits.
5. Physical Education—6 credits.

**CURRICULA IN HOME ECONOMICS**

**CHILD DEVELOPMENT AND PARENT EDUCATION**

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(1) Suggested for the required 15 credits of General Home Economics.
(2) Prerequisites: Art 1, 2; Music 4, 5; Psychology 53.
(3) Group requirement recommendation: Physiology 4; Bacteriology 1; Physics 1; Sociology 10 or 70; Geology 1; Economics 51, 52.
(4) Elective recommendations: Speech 18; Child Development 175; Woodwork 74.

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<th>Junior Year</th>
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**SCHOOL OF HOME ECONOMICS**

## Senior Year

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48 credits

(1) Suggested for 18 credits of general Home Economics.


(5) Recommended to fill required 45 credits for Certification.

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## CLOTHING, TEXTILES AND RELATED ARTS

### Freshman Year

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51 credits

### Sophomore Year

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50 credits

(1) Suggested for the required 15 credits of Home Economics in addition to the major.

(2) Group requirement recommendations: Botany 1 or Zoology 1; Physiology 4; Bacteriology 1, 2; Psychology 53, Economics 51; Chemistry 10, 11, 12; Sociology 10, 70; Speech 1; History 4; World Literature 40.

(3) Elective recommendations: Clothing, Textiles and Related Art 33; Consumer Education 50; Housing Problems 65; Landscape Architecture 3; Radio Speech 81; Music 90, 81; French; Foods and Nutrition 25.
**Junior Year**

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**Senior Year**

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(3) Elective recommendations: C. T. & R. A. 200; H. Ad. 49, 150; Physics 1; Political Science 101, 102, 110; Journalism; Literature; Art 104.

**Foods and Nutrition**

**Freshman Year**

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**Sophomore Year**

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*Alternate years given next in 1950.*
(1) Recommended for the Home Economics requirements of 18 hours in the various departments within the School.

(2) Recommended for group requirements: Physiology 4 and 5; Bacteriology and Public Health 1 and 2; Economics 5; Sociology 70; Speech 1; English 2. Note: (The first four courses listed are required of majors in Institutional Management.)

(3) Recommended for Electives: Psychology 3; Mathematics 34 or 35; Clothing, Textiles and Related Arts 25 and/or 27; Agricultural Economics and Marketing 62; Household Administration 49, 65; Art 1 and 2; Speech 81; Physics 1 Typewriting; Physiology 11; Vegetable Crops 1; Sociology 60.

### Junior Year

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**Total Credit:** 48

### Senior Year

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**Total Credit:** 44

(3) Elective Recommendations: Journalism 112, 113, 114; Education 121, 121b; Bacteriology and Public Health 120; Foods and Nutrition 144; Household Administration 149; Business Administration 55; Economics 28.

### HOUSEHOLD ADMINISTRATION

#### Freshman Year

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**Total Credit:** 48
**Sophomore Year**

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<td>Electives (2)</td>
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48

(1) Group requirement recommendations: Physiology 4; Psychology 53; Sociology 70; Speech 1; History 4; Political Science 1; Art 1, 2; Misc. 1, 80, 81.

(2) Elective recommendations: Landscape Architecture 3; Sociology 60; Foods and Nutrition 35; English 24; Music 38; Journalism 15; Household Administration 50.

**Junior Year**

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48

**Senior Year**

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48

(2) Elective recommendations: Zoology 111; Art 114.

**HOME ECONOMICS EDUCATION CURRICULA**

The following professional program prepares graduates for teaching in the field of home and family living. It certifies graduates to teach any and all phases of home economics in the schools of Utah, including high schools having George-Barden (vocational homemaking).

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 cooperation of schools to provide enough teaching assignments for those registering in these courses.

**Freshman Year**

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48
SCHOOL OF HOME ECONOMICS

(1) Prerequisites: Art I, 2; Chemistry 10, 11, 12; Psychology 53.
(2) Group requirement recommendations: Bacteriology 1 and 2; Economics 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
(3) Elective recommendations: Students are advised to consider:
   a. Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.
   b. Developing understanding of cultural, social, and economic problems through Art; Economics; Music; History; Political Science; Sociology.

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(1) Prerequisites: Art I, 2; Chemistry 10, 11, 12; Psychology 53.
(2) Group requirement recommendations: Bacteriology 1 and 2; Economics 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
(3) Elective recommendations: Students are advised to consider:
   a. Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.
   b. Developing understanding of cultural, social, and economic problems through Art; Economics; Music; History; Political Science; Sociology.
Senior Year

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Education

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<td>Ed. 122</td>
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Courses to complete requirements for professional education may be elected. (Check with major professor in order to be sure requirements for certification are being met.)

Electives (3) 14

(3) Elective recommendations: Students are advised to consider:

- Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.

EXTENSION SERVICE CURRICULA

Requirements for students entering the field of Agricultural Extension Service as County Home Demonstration Agents:

Complete the Home Economic Education Curricula as outlined and in addition:

- Journalism 4 or 12
- Public Speaking 4 or 5
- Sociology 141
- Foods and Nutrition 146
- Extension Methods 151

A three-month training period in a county under supervision is required of prospective Home Demonstration Agents. Plans for the training are made with Director of Extension Service.

Child Development and Parent Education

Helen L. Porter, Assistant Professor; Oral Pugmire, Marion Aikin, Instructors; Lawrence S. Bee, Professor.

Students majoring in Child Development and Parent Education must complete 36 hours including the following required courses: Child Development 60, 70, 174, and 175; Foods 25; Clothing Textiles and Related Arts 55; Speech 18 or English 24; Psychology 105; Zoology 111. The remaining hours may be selected by the student from the approved courses listed below, in conference with the major advisor: Child Development 138, 190; Household Administration 49, 50, 149 and 150; Woodwork 74; Foods 146; Sociology 60; Psychology 123 and 145.

All students graduating from any department of the School of Home Economics are required to have 18 hours of Home Economics in addition to those required in the major. These should be selected as representative subjects in Foods and Nutrition, Clothing, Textiles and Related Arts and Household Administration.

A minor in Child Development should include Child Development 60, 70, 175 A and B and Foods 25.

Students expecting to teach in nursery school, kindergarten or the elementary grades must meet the state requirements for certification. It is recommended that they adopt a major in Child Development and a major in Elementary Education. These majors relieve the students of all requirements for a minor. Heads
of both Education and Child Development Departments should be consulted if this plan is followed.

60. Child Development and Guidance. To acquaint teachers, homemakers, social workers, and any others interested in working with children with some of the fundamentals of child growth and development, and to help them to develop a philosophy of guidance. Each of the following hours: 9, 10, 11, 12, 1, 2, 3, should be free once during the week to allow for scheduling three laboratory hours for observation in the nursery school. Students who can free all but one of these hours should consult the instructor before registering. Open to students of sophomore standing or above. Prerequisite: C.D. 70. Fall and Winter each year, also alternate Spring quarters (5F, W or S)  

60A. Child Guidance. Required of all home economics transfer students who have had only two or three credits in child study. One credit is earned by three hours of observation weekly in the nursery school. (See Child Development 60.) (2F or W)  

70. The Health of the Family. The anatomy and physiology of the reproductive system, preparation for motherhood, and the physical care of mother and child from the prenatal period to the end of the first year of the child’s life. (3F, W or S)  

138. Survey in Child Development. The history of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration. Open to Child Development majors only. (5S)  

140. Special Problems in Child Development. For qualified students majoring in Child Development, upon consultation with instructor. Any quarter. Time and credit arranged. (Staff)  

174. Nursery School Methods. This 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. (2F, W or S)  

175. Practice Teaching in the Nursery School. An opportunity to apply the principles of child guidance in the nursery school. Open only to Child Development majors and minors. Prerequisites: C.D. 60 and 70. (5S)  

176. Advanced Practice Teaching in the Nursery School. A continuation of Child Development 175; an additional opportunity to work with young children. One conference weekly with instructor. Open only to Child Development majors. Prerequisite: C.D. 175. (4-6F, W or S)  

190. Seminar in Child Development. Discussions and reports of current readings in Child Development. Open only to Child Development majors. (15S)  

Sociology 60. Courtship, Marriage and the Family. Designed to help unmarried students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. (4F, W or S)  

Clothing, Textiles, and Related Arts  

Effie Barrows, Professor Emeritus; Bertha F. Johnson, Professor; Florence Gilmore, Assistant Professor; Rhea Hurst, Assistant Professor, Extension Home Furnishings Specialist; Mignon Perry, Jean Dance, Instructors.  

Students who elect Clothing, Textiles and Related Arts as their major are required to complete the following courses: Clothing 9, 24, 25, 27, 105, 115, 125, 133, 140, 165, 170, 175, 185, 191; 18 credit hours in the art department to include Art 1, 2, 3, 32 with the additional hours in 111, 123, 128 croft or studio classes Clothing, Textiles and Related Arts majors may elect to minor in Art, Education, Merchandising, Business, Foods and Nutrition, Child Development, Social Science, Physical Education, English, etc.  

Clothing, Textiles, and Related Arts majors to be graduated from the School of Home Economics must have 15 hours of Home Economics besides the major,
Development and Household Administration.

The following courses are required for a minor in Clothing, Textiles, and Related Arts: 9, 24, 25, and 115. Other courses may be elected to complete the minimum of 18 credits required for a minor.

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. 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.

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.

5. Dress and Personality. Open to all college girls desiring assistance in planning and selecting campus clothes to suit personality and income. No construction. Girls who expect to major in Home Economics should take 9 instead of this course. (2F, W or S)

Perry

6. Construction Problems. Open to non-Home Economics students having had clothing 5 who wish to develop skill in construction techniques. (3F, W or S)

Dance

9. Clothing for the College Girl. Designed to assist the college girl in selecting and adapting her clothes in terms of campus activities and personal expressiveness. Construction of a blouse speed project and a dress. Open to all college girls. (3F, W, or S)

Perry, Gilmore

15. Clothing Selection and Appreciation for Men. Men's apparel as related to the wearer. Consideration is given fundamentals of fabric selection. Organized to meet the needs of men from all schools of the college. (3W)

Gilmore

24. Textiles. Fibers, yarns, fabrics and finishes in relation to problems of the consumer. Prerequisite: Chemistry recommended. (3F, W or S)

Gilmore

25. Clothing, Selection and Construction. Consideration is given 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, good procedures and finishes. Prerequisites: Clothing, Textiles, and Related Arts 9, 24, and prerequisite or parallel Art 2. (3F or W)

Gilmore

27. Household Textiles. Consideration is given fabrics for household and personal use, stressing selection, utilization, care and cost. Prerequisite: Textiles 24. Consumer Education 50 recommended. (3S)

Gilmore

33. Home Furnishings. Planned to develop skill in selecting and techniques in making, remodeling, and caring for home furnishings. The laboratory includes instruction on making of draperies, curtains, lamp shades, use of sewing machine attachments, refinishing and upholstering furniture. Open to college girls. Outside work required. (3F, W or S)

Dance

55. Fundamentals of Family Clothing. Family clothing problems with special study and construction of children's garments from the standpoint of the aesthetic, physiological, and psychological development of children of different age levels. Prerequisite: Clothing Textiles, and Related Arts 9 and 25. (3S)

Johnson

105. History of Costume. Development of costume from ancient to modern times. Shows social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. Prerequisite: History 4 recommended. Recommended for students in Home Economics, Costume Art, Physical Education, History, Speech and Dramatics. (3F)

Perry

115. Costume Design. Comprehensive study of art elements and principles of design as related to dress for the individual. Application and ability to achieve beauty and art, quality in dress, in the home, and daily life are aims. Prerequisites for Home Economics Education and Clothing, Textiles, and Related
Arts majors: Art 1 and 2: Clothing, Textiles and Related Arts 9, 24, and 25. Art and Clothing to satisfy the instructor for others. Outside work required. (3F or W)

125. **Applied Costume Design.** Creative experience in dress designing by draping on the dress form. Emphasis is placed on fitting and understanding the effect of pattern, grain, and texture on design in dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles and Related Arts 9, 25 and 115. Outside work required. (3W)

133. **Home Decoration.** The homemaker's practical approach to problems of decorating and furnishing the home. (3F or W)

140. **Decorative Textiles.** Historic textiles, including printed and hand woven textiles, tapestries, damasks, oriental rugs, and laces. Laboratory work consists of weaving, needlecraft, and various means of developing decoration for garments, accessories, and household furnishings. Prerequisites: Art 1, 2, 3. Clothing, Textiles and Related Arts 105 and 115 prerequisite or parallel. (3W)

165. **Tailoring.** Application of techniques used in tailoring suits and coats. Prerequisites: Clothing, Textiles and Related Arts 9, 24, 25, 115. Outside work required. (3F or W)

170. **Flat Pattern Designing.** Principles underlying design and construction of patterns for various figures includes drafting a basic pattern and provides opportunity for further study in designing, fitting and alteration of patterns. Prerequisites: Clothing, Textiles and Related Arts 9, 25, 115 and 125. Outside work required. (3S)

175. **Textile Testing.** Physical and chemical properties of textiles, fibers, laboratory and household tests used in their identification, and application of these factors to choice and care of the fabrics. Consideration to use of microscopic study, physical testing and quantitative analysis. Prerequisites: Clothing, Textiles and Related Arts 24 and 27. Chem. 10, 11 and 12 recommended. Outside work required. Alternate years only; offered next in 1950. (3S)

185. **Family Clothing Problems.** Family clothing problems with emphasis on economic, sociological and psychological aspects. Practical problems may include: clothing budgets, selection of children's clothing, and care and renovation of clothing. (3F and S)

190 or 290. **Special Problems.** Independent study under direction of professor of a problem in clothing, textiles, or related arts in which upper division or graduate student has special interest or need. Consult department head before enrolling. Any quarter. Time and credit arranged. (3S or W)

191. **Readings.** Reports and discussion on current literature in clothing, textiles and related arts. (2S)

200. **Commercial Clothing.** Experience in constructing garments for adult figures on a commercial basis with emphasis on speed, efficiency, and fitting. Field trips to commercial custom tailoring and dress-making shop and alteration departments to study shop management. Prerequisites: Clothing, Textiles and Related Arts 125, 165 and 170. (3W)

210. **Research for Master's Thesis.** Credit arranged. (F, W or S)

**Foods and Nutrition**

Ethelyn O. Greaves, Una Vermillion, Ethelwyn Wilcox, Professors; Edna Page, Priscilla Rowland, Elna Miller, Extension Nutritionist, Assistant Professors;...Instructor.

(For Curriculum see pages 234, 235.)

Students majoring in Foods and Nutrition are required to complete the following courses: Foods and Nutrition 24, 25, 107, 140, 141, 145, 146, 180, 191; Chemistry 10, 11, 12; Biochemistry 90 or 190. Minors may be elected within any department of any other school in the College.

Those who expect to graduate from the School of Home Economics must have 18 credits of Home Economics besides the major. These subjects should include representative courses in other departments within the school, i.e., Clothing, Textiles and Related Arts, Child Development, and Household Administration.
In addition there are definite course requirements for the specialized fields within the Foods and Nutrition Department.

**Institutional Management.** The majors in this field will find all the requirements for this specialized subject listed in the 4 year outline in Foods and Nutrition on pages 234 and 235.

Research: Foods and Nutrition 144.
Journalism: Journalism 12, 112.
Certification for Teaching: (See School of Education).
A Master of Science degree is offered in Foods and Nutrition.

5. **Principles of Nutrition.** The relation of food to the health of the individual; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. (3F, W or S) Rowland

10. **Nutrition and Food Preparation.** (For men) Nutritive value of foods; present day problems in nutrition; selection of an optimal diet for health. Principles of food preparation and meal service. Open to men in all schools. Two lectures, one lab. Rowland

24. **Food Preparation and Serving.** Principles of food selection preparation, and serving. Open to all women students. Two lectures, one demonstration and two three-hour labs. (5)

25. **Meal Preparation for the Family.** Planning, preparation and serving of meals for the family and their guests with consideration of nutritional adequacy of meals at different income levels and for special occasions. Prerequisite: Foods 24. Three lectures, one three-hour lab. (3)

100. **Quantity Food Preparation for School Lunch and Special Occasions.** Designed to meet needs of the Vocational Home Economics student. Emphasis on planning balanced school lunches and on organization, preparation, and service of foods in large quantities for special events. Pre-requisites: Foods 24. (3S) Vermillion and Zollinger

107. **Experimental Cookery.** Development of experimental methods; their application to investigation in cookery and food preservation; acquaintance with the literature in the field; preparation of the student for independent investigations in foods. Prerequisites: Chem. 5 or 11; Foods 24 and 25. (3S) Wilcox

140 and 141. **Advanced Nutrition.** Application of fundamentals of biochemistry to nutrition of man with practice in calculation of dietaries in health. Consideration is given to nutrition of the child at all ages. Prerequisites: Biochem 90, 190 or equivalent. (3F or W) Wilcox

142. **Nutrition and Dietetics.** A review of fundamentals of chemistry and biology as applied to human nutrition with practice in calculation of dietaries. Required of all Home Economics Education students. Prerequisite: Organic Chem. (4F or S) Greaves

144. **Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations. Prerequisites: Biochem. 190 or permission of instructor (2W) Greaves

145. **Diet Therapy.** Application of dietetic principles to problems of disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. (4W) Greaves

146. **Food Technology.** A study of manufacture and preservation of food products and the influence of these processes on the physical, chemical and nutritive values of foods. Prerequisites: Bact. 1 and Foods 24. (3F) Greaves

160. **Special Problems.** Open to qualified students majoring in Foods and Nutrition upon consultation with the instructor. Any quarter. Time and credit arranged. Wilcox

180. **Quantity Food Preparation.** Principles of cooking applied to large quantity preparation, standardization of food quality and production cost. College cafeteria kitchen used as laboratory. Open only to juniors majoring in Institutional Economics. Prerequisites: F & N 5, 24 and 25. (5W) Vermillion

182. **Institutional Organization and Management.** Principles of scientific management applied to Food Service Units. Emphasis on forms of business organization, employer-employee relations, record keeping and other management problems. (3F) Vermillion
183. **Food Selection and Purchase for Institutions.** Consideration of sources, grading, standardization, basis of selection, methods of purchasing and storage of foods. A three day field trip to Ogden and Salt Lake markets and institutions. Approximate cost $12.00. Prerequisites: 180 and 182 (4S) **Vermillion**

191. **Seminar in Foods and Nutrition.** Reports, discussions, and review of recent scientific literature in Nutrition. Prerequisite: Foods and Nutrition 141 or 142. (2S) **Greaves**

201. **Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral and vitamin determination. Prerequisite: Chem. 190 or 191 or equivalent. (3) **Wilcox**

202. **Biological Assay of Foods.** Problems in the biological assay of vitamins in foods. (3) **Wilcox**

103 or 203. **Nutrition Laboratory.** Micro-chemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chem. 190 or 191 or equivalent. (3) **Wilcox**

210. **Research for Master's Thesis.** Credit arranged. **Wilcox**

242. **Recent Developments in Nutrition.** Study of problems in nutrition selected according to the needs of the students. Prerequisite: Nutrition 141. (3F or W) **Wilcox**

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**Household Administration**

**Ethelyn O. Greaves, Professor; Oretta M. Carlson, Elizabeth Colbert, Instructors.** For Curriculum see page 233.

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying effects of social and economic forces on the home and its management.

10. **Home Economics Survey.** Introduction to Home Economics. Required of all home economics majors. (1F) **Staff**

49 or 149. **Home Management.** Principles of household management and efficiency. Two recitation periods and one two-hour laboratory period each week (3F, W or S) **Carlson**

50. **Consumer Education.** Consumer's problems as they relate to food, clothing and household management. Emphasis on money management in the home. (3F, W or S) **Staff**

65. **Housing Problems.** Consideration of present housing needs and practices affecting housing construction and home ownership. (3F, W or S) **Carlson**

100. **Fundamentals of Household Equipment.** Selection, methods of operation and care of equipment used in the home with emphasis on kitchen and laundry equipment. Consideration of home lighting, plumbing, heating and ventilating. (2W) **Carlson**

150. **Home Management House.** Residence students are directed in practical management of home problems. Prerequisites: H Ad 49, FN 25. Required of Home Economics Education and Household Administration majors. Elective for other upper division students upon consultation with the Dean of Home Economics and the Advisor of the Home Management House. (3F, W or S). Time arranged. **Carlson**

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**Home Economics Education**

**Helen L. Cawley, Associate Professor.**

A Master of Science degree may be earned in Home Economics Education.

120. **Education 120. Methods in Teaching Home Economics.** Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; development of a method which will lead the teacher to understand better the nature of learning. Prerequisite or parallel: Psych. 102 (3F or S) **Staff**
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.) It is suggested that this course be blocked with Education 122a and with one other three-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)

Education 122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave 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 Ed. 121 and 122a, preferably at beginning of her junior year, to make other arrangements for student teaching. In the latter case, the student teacher will teach at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W)

Education 123. Student Teaching in Home Economics for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student nurses, student dietitians, and patients. For other non-vocational homemaking majors interested in securing practical teaching experience. In Spring the student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120 with Ed. 121 taken the same quarter as Ed. 122b. (4S) (This course does not fulfill requirements for Vocational Homemaking Certificate.)

Field Trip. For senior girls and graduate students enrolled in homemaking education. Planned cooperatively by students and Homemaking Education teachers leave 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 Ed. 121 and 122a, preferably at beginning of her junior year, to make other arrangements for student teaching. In the latter case, the student teacher will teach at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W)

Home Economics 199. Special Problems in Home Economics Education. Developed around individual needs of students not otherwise provided for in curriculum. (1-2 F, W or S)


Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools

Follow the Home Economics Education Curricula. 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 will assist in the understanding of young people of school age.
*Psychology 102 ................................................ 5
*Public Health 155 ........................................ 3
Psychology 112 ........................................ 2
Education 113 ........................................ 3
Child Development 60 ........................................ 5

Group II Six credits in understanding the school.
*Education 114 ........................................ 3
Education 111 or 112 ........................................ 3
(Educ. 112 is usually blocked with Educ. 121.)

Group III Fifteen credits in Student Teaching, including methods.
*Education 120 ........................................ 3
*Education 121 ........................................ 4
*Education 122 ........................................ 8

*It is necessary to make arrangements for specific Education course with major professor at time when plans are made for Ed. 121 and 122a.
A total of thirty-three credits in professional education, including Bacteriology 155, must be presented to meet the requirements. The 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 the requirements for renewing certificates.
2. Opportunity to meet certification requirements is offered teachers or other persons.
3. Advanced study leading to Master of Science in Home Economics Education is offered.
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General Information


UTAH STATE AGRICULTURAL COLLEGE, having accepted the provisions of the Act Congress approved July 2, 1862, is classified as a Land-Grant College and is therefore obliged to offer a course in Military Science and Tactics as a part of the College curricula. The obligations to provide military instruction on Land-Grant institutions by the Act of July 2, 1862, are not altered by the National Defense Act of 1920 as amended.

Recognizing that preparation for national defense is an important duty of citizenship, and that qualities of patriotism, loyalty, discipline, leadership, and respect for constituted authority inculcated by proper military training are valuable in the formation of character, it has been the consistent policy of the College to cooperate with the Federal Government in making the Department of Military Science and Tactics as effective as practicable.

At the request of the College authorities a senior unit of the Reserve Officers’ Training Corps was authorized at this Institution by the President of the United States by the provisions of Section 33 of the Army reorganization Act of June 4, 1920. Accordingly, the Board of Trustees has agreed to maintain a two-year basic course in Military Science and Tactics as a required subject for all qualified male students.

The primary object of establishing units of the Reserve Officers’ Training Corps is to qualify students for appointment in the Officers’ Reserve Corps of the United States Army and Air Force, and also for commissions in the Regular Army and Air Force as “Distinguished Military Graduates.” This training will also be as valuable to the student in his industrial or professional career as it would be should the nation call upon him to act as a leader in its defensive forces.

Enrollment in the Reserve Officers’ Training Corps is not in any sense “conscription,” nor does it convey liability to service in any component or branch of the United States Army except as required for selective service deferment. As its name implies, the R. O. T. C. is an instrument of training and instruction only.

Military Science Regulations

The student, by registration at the Institution, obligates himself to conform to such requirements as are or may be prescribed by the College under regulations of the Reserve Officers Training Corps. These requirements follow: Two years of military training (six credits) are required of all qualified male students. By regulations of the College, the basic course is normally required during the first and second years at the Institution.

To receive instruction at the College or to graduate from the College, the student must attend military classes and do satisfactory work in them. It is the duty of every student of whom military training is required, to see that he is properly registered for the course and to report for instruction. Students who are required to take military training but fail to register or to report for classes will, with the approval of the President, be excluded from all classes in the College. The responsibility of complying with the regulations regarding Military Science rests entirely with the student.
The 11 a.m. hour on Thursdays is reserved exclusively for Military Drills. No other classes will be allowed to conflict with this hour.

A student claiming exemption from Military Science must present a petition for such excuse at the time of registration. Pending the action of the petition, the student will register for the course prescribed and will enter upon the work of such course.

Any student who may be excused from attendance in Military Science for any valid reason must make up the deficiency in other departments of study.

Every student registered for Military Science is required to make a uniform deposit of $5.00. A laboratory fee of $2 is deducted from this deposit. The balance, less the cost of any property lost or damaged, is refunded upon the completion of the year or upon withdrawal from the course.

Reserve Officers' Training Corps

The four years' course in the Reserve Officers' Training Corps is divided into the Basic Course and the Advanced Course.

The Basic Course consists of the first two years in Military Science and normally corresponds to the freshman and sophomore years. When entered upon by any student it shall be a prerequisite for his graduation unless he is relieved from this obligation by proper authority. Students transferring from institutions not having R.O.T.C. Units must enroll.

The Advanced Course consists of the third and fourth year of Military Science. Entrance upon the Advanced Course is elective, but once entered upon, it becomes a prerequisite for graduation, unless the student shall be honorably discharged in accordance with provisions of Army Regulation 145-10.

Student electing Military Science as a major subject should do so at the beginning of the freshman year in order that sufficient time may be available to complete the Advanced Course. The School of Arts and Sciences offer a major* in Military Science.

Uniforms and Equipment

An officer type uniform and overcoat of standard army pattern is furnished by the War Department to each student taking military training. Shoes are not furnished. Each student should provide himself with a pair of brown shoes before entering the College, as they will be required immediately upon his admission.

The uniform and equipment issued for the use of a student, remains the property of the United States. At the end of each year, or at such other times as students may terminate their military training, all clothing and other supplies will be returned in a serviceable condition, not later than one week following the termination of such training. Articles which have been lost, damaged, or destroyed are charged against the student concerned.

Any student not returning the previously mentioned uniforms and equipment or not paying for articles lost shall have suspended all college credit earned at this institution until the debt to the college is liquidated.

BASIC COURSE

Students in the Basic Course are required to pursue their courses diligently until satisfactorily completed, and to meet such requirements for care of equipment as may be prescribed. In case of failure in any quarter, the student is required to repeat the work.

General conditions for enrollment in the ROTC. All students formally enrolled in the Basic and Advanced Course of the Senior Division ROTC must be—

* A Department Major in the School of Arts and Sciences is offered in Military Science and Tactics. Prescribed requirements are: M. S. and T. 36 credits. Mathematics 34, 35, 46, 97, min. 18 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits. History 17 and 21, 10 credits.
2. Physically qualified, under standards prescribed by the Departments of the Army and Air force. (See AR 40-105). Due allowance will be made for those defects which are correctible before the student, who is otherwise qualified, becomes eligible for appointment as a commissioned officer.
3. Accepted by the institution as a regularly enrolled student.

In addition to the general conditions for enrollment in the ROTC enumerated above all students formally enrolled in the Basic Course must comply with the specific conditions listed below:

1. Be not less than 14 years of age and must not have reached 23 years of age at the time of initial enrollment in the Basic Course.
2. Successfully complete such general survey of screening tests as may be prescribed.

ADVANCED COURSE

In addition to the general conditions for enrollment in the ROTC enumerated in the Basic Course above, all students formally enrolled in the Advanced Course ROTC must comply with these conditions:

1. Not have reached 27 years of age at the time of initial enrollment in the Advanced Course. Formally enrolled members of the Advanced Course are exempt from induction, training, or service under the Selective Training and Service Act of 1948 as amended.
2. Successfully complete such survey and general screening tests as prescribed.
3. Be selected by the PMS and T and the head of the institution.
4. Execute a written agreement with the Government.
5. Have completed the Basic Course or equivalent thereof.
6. Be enrolled in an academic field prescribed by the chief of a technical service if admission to the Advanced Course in a unit of a technical service is desired.

Credit for Previous High School, Junior Division, ROTC Training

7. One quarter's credit is allowed for each year's work completed in the Junior Division ROTC. This does not obviate the college requirements of six quarters of Military Science or Physical Education, so it may be used in lieu of three quarters thereof.

Credit for active military or naval service in lieu of the Basic Course, R.O.T.C.

Veterans who have been honorably discharged, or transferred to the Enlisted Reserve Corps and relieved from active duty, are given credit under the provisions of Public Law 81—79th Congress, in lieu of completion of all or part of the basic course, R.O.T.C., on the following basis:

a. For not less than six months' active service in the Army, Navy, Marine Corps, or Coast Guard, credit in lieu of first year Basic Course.

b. For not less than one year of such active service, credit in lieu of the entire Basic Course.

Contracts. Separate contracts are executed between the Government and students enrolled in the Advanced Course. Such a contract requires a student to complete the Advanced Course of training and to attend the Advanced Camp at the time specified unless he is sooner discharged for the convenience of the Government. The contract does not specify that the Advanced Course must be pursued without interruption. However, the contract is cancelled if the Advanced Course is interrupted for two calendar years. During their period of participation in the Advanced Course, duly enrolled students are paid monthly a monetary allowance in lieu of subsistence at a daily rate equal to the value of the commuted ration. Upon obtaining the necessary legislation, such students are paid an additional allowance in lieu of quarters and uniform at the rate of $1.00 per day.
Summer Camp. Students attending ROTC summer camp are quartered, and are paid at the rate prescribed for soldiers of the 7th grade. The Department of the Army will seek legislation authorizing the payment to students attending the ROTC summer camp at the rate prescribed for soldiers of the 6th grade. A travel allowance from the institution to camp and return to the institution at the rate of 5 cents a mile is authorized students eligible to attend the advanced summer ROTC camp.

R. O. T. C. Band

A military band is an element of the Reserve Officers’ Training Corps, under the direction of the Band Instructor, and is governed by the rules of the Department of Military Science and Tactics. Uniforms and instruments are furnished by the Department of the Army.

Members of the band will be selected from among those students who are registered in Military Science and who have demonstrated their ability for such selection. Tryouts for the band will be conducted under the supervision of the Band Instructor and will be held preferably during the first two weeks of each quarter. Members of the band receiving credit in Military Science will be limited to not more than sixty students.

Students selected for the band are required to take all theoretical work in Military Science and sufficient practical drill to insure making a creditable appearance in ranks. They play with the band only at regular drill formations.

Basic

Students satisfactorily completing the Basic Course receive one credit per quarter, which may be included in the 186 credits required for graduation.

Students satisfactorily completing the Advanced Course receive three credits per quarter, which count toward the 186 credits required for graduation. In addition, students enrolled in the Advanced Course will receive six credits for satisfactory completion of the six weeks’ course at the Advanced Camp, conducted annually and normally attended after completion of the first year of Advanced Course. If the length of the summer camp is increased the credits allowed for summer camp will be increased accordingly, on the basis of one credit for each additional week, up to a total of nine weeks.

For students desiring a major in Military Science, at least 6 credits of Military Science Seminar are required. Other members of the Advanced Course may take seminar with the approval of the PMS&T. Research work to be done in military history, tactics, strategy, logistics, development of weapons, evolution of warfare, and related fields. Practical work to be done in motors, supply, administration, etc. with the members of the staff.

Students majoring in the Schools of Arts and Sciences, and Engineering may submit Advanced Military Science as a minor for graduation.

Members of the band who successfully complete the work in the various quarters receive credits as follows: First and second years, one credit per quarter in Military Science.

Courses of Instruction

Classes in Military Science will not be held at times other than as scheduled, but any student desiring extra instruction may make the necessary arrangements with the Professor of Military Science and Tactics.

BASIC COURSES

1. 2. 3. Military Science. First year. Staff

These courses follow the Program of Instruction for Military and Civilian Colleges, laid down in Department of the Army Training Program ATP 145-1, dated 10 February 1949. They cover the following subjects:
Introduction to military science
a. Military organization
b. Military policy of United States, National Defense Act and ROTC
c. Evolution of Warfare
d. Maps and aerial photographs
e. Military psychology and personnel management
f. First aid and hygiene

Elements of national power
a. Geographical foundations of national power
b. Military problems of the United States
c. Military mobilization and demobilization

Leadership, drill, and exercise of command
(1F. 1W. IS)

4. 5. 6. Military Science, Artillery.
These courses follow the Program of Instruction for Military Science II as laid down in the Army Training Program 145-1, dated 10 February 1949. They cover the following subjects:
Introduction to antiaircraft artillery automatic weapons
Characteristics, capabilities and limitations of antiaircraft artillery automatic weapons
Service of the piece—automatic weapons fire unit
Introduction to antiaircraft artillery guns
Characteristics, capabilities and limitations of 90-mm antiaircraft artillery guns. Service of the piece. 90-mm guns. (1F. 1W. IS.)

14. 15. 16. Military Science Quartermaster. Staff
These courses follow the program of Instruction for Military Science II as laid down in the Army Training program 145-1, dated 10 February 1949. They cover the following subjects:
1. Organization to Supply in the Army
2. Organization and Functions of the Quartermaster Corps
3. Classification of Supplies, Use of Stock Catalogs and Basis of Allowances
4. Property Accountability and Responsibility
5. Research and Development in the Quartermaster Corps
6. Organization, Functions and Operations of Quartermaster Units
7. Unit and Organization Supply (1F. 1W. IS)

24. 25. 26. Military Science USAF. Staff
For the first time the Basic ROTC course will offer the student information of a specialized nature. This information will enable the student to specialize in one of the branches of the service as well as a particular field within the USAF. The following subjects will be offered: aerodynamics and propulsion; weather and navigation; applied air power, which includes a study of rockets and guided missiles; plus specialized study in one of the three branches, Armament, Administration, or Communications. This course of study is designed to give the student a better overall knowledge of the USAF, plus a specialized knowledge of one of the fields which it encompasses. By pursuing this course to completion, students who are otherwise qualified may go through pilot training at Randolph Air Force Base as commissioned officers. (1F. 1W. IS.)

R.O.T.C. BAND COURSES

1B, 2B, 3B. R.O.T.C. Band. First year. (1F. 1W. IS) Christiansen
4B, 5B, 6B. R.O.T.C. Band. Second year. (1F. 1W. IS) Christiansen

ADVANCED COURSES

101, 102, 103. Military Science, Artillery. The newly instituted ROTC program of instruction. Training is provided in branch material subjects for first
year advanced (Artillery) ROTC students. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of artillery units of all echelons. The latest material and training aids available are used to supplement instruction. The ultimate goal of the course is a commission as a Second Lieutenant in the Officers Reserve Corps, or a commission in Regular Army for "Distinguished Military Graduates." (3F. 3W. 3S)

104. 105. 106. Military Science. Artillery. The newly instituted ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Artillery) ROTC students. In staff and administrative subjects time is devoted to study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of artillery units of all echelons. The latest material and training aids available are used to supplement the instruction. Completion of this course satisfies military academic requirement for a commission as Second Lieutenant in Officers Reserve Corps or a commission in Regular Army for "Distinguished Military Graduates." (3F. 3W. 3S)

111. 112. 13. Military Science. Quartermaster. The newly instituted post-war ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for first year advanced (Quartermaster Corps) ROTC students. In staff and administrative subjects emphasis is on psychology of leadership and military problems of the United States. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of Quartermaster Corps units of all echelons. The latest material and training aids available are used to supplement instruction. The ultimate goal of the course is a commission as Second Lieutenant in Officers Reserve Corps or commission in Regular Army for "Distinguished Military Graduates." (3F. 3W. 3S)

114. 115. 116 Military Science. Quartermaster. The newly instituted post-war ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Quartermaster Corps) ROTC students. In staff and administrative subjects time is devoted to study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned with the latest developments and trends in Tactics and Technique of Quartermaster Corps units of all echelons. The latest material and training aids available are used to supplement instruction. The completion of this course satisfies military academic requirement for a commission as Second Lieutenant in Officers Reserve Corps or a commission in Regular Army for "Distinguished Military Graduates." (3F. 3W. 3S)

121. 122. 123. Military Science Air—Administration. Staff

121A, 122A, 123A. Military Science Air—Armament.

121B, 122B, 123B. Military Science Air—Communications.

These courses are composed of the subjects as outlined in the new Air-curriculum of 1949. This curriculum is designed to make available to the student the specialized information which will best fit him for a career in the USAF, whether he chooses to be an active or inactive duty status. This curriculum emphasizes specialized studies in Administration, Armament, or Communications, plus work of such a nature that the overall picture of the functioning of the Air Force and the part that each member plays in it is brought out. The most up-to-date training aids, movies, plus newly written text books, all combine to make the course interesting as well as educational. (3F. 3W. 3S)

124, 125, 126. Administration and Military Management, Military Science Air.

124A, 125A, 126A. Armament, Military Science Air.

124B, 125B, 126B. Communications, Military Science Air.

The student will continue specialization during his second year of Advanced Military. Upon completion of the course, the student will be potentially qualified for a particular job in the Air Force according to his specialized subject. The latest material and training aids available are used to supplement the military instruction in all of the specialized courses. The final goal of the ROTC Training
for the cadet is a commission as a Second Lieutenant in the Officers Reserve Corps or a regular Air Force Commission for "Distinguished Military Graduates." The staff and administrative subjects will include such studies as those of Psychological Warfare, Command and Staff Duties, Geographical Foundation of National Power and Military Teaching Methods. (3F, 3W, 3S)

**SPONSOR DRILL COURSES**

51, 52, 53. Military Science, Sponsor Drill. Freshman year. A drill course for girls elected to Corps of Sponsors. (1F, 1W, 1S) Staff
54, 55, 56. Military Science, Sponsor Drill. Sophomore year. (1F, 1W, 1S) Staff
157, 158, 159. Military Science, Sponsor Drill. Junior Year. (1F, 1W, 1S) Staff
160, 161, 162. Military Science, Sponsor Drill. Senior Year. (1F, 1W, 1S) Staff

**GIRLS' RIFLE COURSES**

71. Military Science, Girls' Rifle Course. A basic course in marksmanship. (F, W or S) Staff
72. Military Science, Girls' Rifle Course. An advanced course in marksmanship. (F, W or S) Staff

**ADVANCED CAMP**

110. Military Science, Artillery.
120. Military Science, Quartermaster.
130. Military Science, Air.

The advanced camp consists of practical and theoretical military instruction of a specialized type and is of six weeks' duration. The War Department will seek legislation to extend the period of the advanced camp to eight weeks. Students normally attend the advanced camp between the two academic years of the advanced course. Credits for advanced summer camp are on the basis of one credit for each week of attendance.

151, 152, 153. Military Science Seminar. Prerequisite: First year advanced ROTC course (Artillery, Quartermaster, or Air Force) and approval of PMS&T. May be taken concurrently with first year advanced course. Credits arranged. Staff
154, 155, 156. Advanced Military Science Seminar. Prerequisite: Military 151, 152, or 153, second year advanced ROTC (Artillery, Quartermaster, or Air Force) and approval of PMS&T. May be taken concurrently with second year advanced course. Credits arranged. Staff
# RESEARCH AND EXTENSION

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The Agricultural Experiment Station, established in 1889, is a major division of the College. It is responsible for conducting research in Utah under provisions of the Hatch, Adams, Furnell, Bankhead-Jones and Agricultural Research and Marketing Acts of Congress, and of various acts of the Utah State Legislature. 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. The research results are prepared for dissemination in the form of 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 120, many of whom 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 various bureaus of the U. S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

The main offices of the Agricultural Experiment Station, including the office of the Director, the Division of Publications, and the Statistical Laboratory, are on the College campus, on the first floor, south wing of the Main Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed as necessary among the various College buildings.

Greenhouses are maintained for investigations in horticulture, vegetable crops, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the Branch Agricultural College, at the U. S. Forest Service Desert Range Station, and on the ranges in different parts of the state.

The Station also maintains a number of experimental farms:

- At the Dairy Experimental Farm, composed of about 130 acres of land, barns and a house, the Station maintains an experimental Holstein dairy herd of about 60 pure-bred animals. Pasture investigations are also conducted here.
- The Greenville Farm, a 45-acre tract, is used for experimental work in plant breeding and other phases of crop production.
- The Farmington Substation at North Farmington is a 57-acre tract used for experimental work in horticulture and vegetable crops.
- At the Nephi Farm experimental work in dry farming and range seeding is conducted. This farm is composed of 103 acres.
- The Forage Experimental Farm, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering for study of the improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.
- The Ogden Substation located in Weber County north of Ogden is a 71-acre tract used for investigations in fruit production.
- The Poultry Experimental Farm, a new farm in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.
- The Turkey Experimental Farm is a new 33 acre farm east of the Campus used for turkey breeding, nutrition, and disease control studies.
- The Station also owns farm plots near the College and in Washington County, and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these may be mentioned the soil survey work; plant disease surveys, problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of the social problems
connected with rural living: the 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.

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 stimulate and elevate engineering education by developing the research spirit in faculty and students.

(11) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results 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.
Farm income is expressed in terms of cash; fresh food, comfortable homes, and pleasant surroundings. The stabilizing effect of farm ownership and close contact with nature develop virtues in farm families which result in the highest type of citizens.

The main objective of the Extension Service is to aid rural people in developing useful and satisfactory lives. Its programs are designed to help people help themselves, rather than doing things for them. It gets the people's view point of their problems and needs through program planning meetings. 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.

Extension programs conducted with and for the people usually result in increased production per acre and per animal unit, more efficient marketing, conservation of the soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work which give boys and girls more appreciation for the farm and home and better understanding of national and world affairs.

The Extension Service is a part of the College, and a part of the Federal Extension Service. It has agricultural and home demonstration agents in practically 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, dairying, dairy manufacturing, entomology, home furnishings, home management, horticulture, irrigation, marketing, nutrition, poultry, recreation, rural sociology, and soil conservation.

To help train rural leaders, the Extension Service conducts free, non-credit short courses in various agricultural and home economic subjects. These courses are given at the College.

EXTENSION CLASSES, HOME STUDY, BUREAU OF VISUAL AIDS IN EDUCATION

L. G. Noble, Supervisor

The department of Extension class work, Home Study courses programs and the Bureau of Visual Aids in education is fully accredited by the National University Extension Association.

Through its Extension Service the College also offers extension classes, home study (correspondence) courses, and visual aids in education. People interested in these services should contact their local county extension agent.

EXTENSION CLASSES. Extension Classes are offered in practically all subjects. In-service helps to teachers are available in every department including classes for the renewal of teaching certificates. Classes will also be provided in vocational fields and for special-study groups.

HOME STUDY. Utah State Agricultural College was one of the first educational institutions of the Intermountain Region to establish a Home Study Department. Correspondence 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 must be at least nineteen years of age, or must submit fifteen units of high school work, or must be graduates of a high school for admission to Correspondence study courses of college grade. One-fifth of the credits (37) necessary for a degree may be earned through this department.
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, Forestry, Geography, 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.

A special catalog of Home Study Courses will be mailed on request.

REGULATIONS GOVERNING EXTENSION WORK

I. GENERAL

All instructors in extension 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.

Extension 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.

II. RESIDENCE COURSES SUPERVISED BY EXTENSION DIVISION

Residence credit shall not be given for off-campus work without special approval of the Deans Council.

Courses carrying extension credit should not exceed 120 minute periods.

Extension classes for graduate students will not be given without special permission of the Graduate School.

III. HOME STUDY COURSES

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 of 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 Extension credits, see section on "Graduation" in introduction of this catalog.)

VISUAL AIDS IN EDUCATION. The service of the Bureau of Visual Education is being made available to all schools, clubs and community groups. At present the Bureau is especially prepared to give service in the fields of Agriculture, Home-making and Recreational Activities. New films on timely topics and subjects are being added to the Library constantly. Individuals and school and community groups are invited to contact the Bureau with their visual education problems.

Catalog information and instructions on how to obtain department films from the various depositories in the United States is available in this office.
Summer School

M. R. Merrill, Dean

For more than 30 years the College has conducted Summer School as an important part of its educational program. Since 1924, the offering has been materially enlarged and enriched. The purpose of this large educational undertaking is to bring to Logan, with its delightful summer climate and many recreational features, a number of the leading educators of the nation, and build, in the Intermountain West, a Summer School of wide influence.

During the Summer School all departments of the College offer courses, the program being arranged to meet the particular needs of summer students. The courses offered in Education, Psychology, and related departments make it possible for the students to meet all of the requirements for Utah certification. The curriculum will also meet most of the requirements for certification in surrounding states.

In past years the majority of summer students have been teachers in secondary and elementary schools. At present an increasing number of regular students are continuing through the summer. High school graduates are also entering the college immediately rather than postponing entrance to the Fall Quarter. Returning service men and women are particularly 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 being arranged to meet this trend. Consequently, practically all of the departments are offering much of their regular program during the Summer Quarter.

Graduate Credit

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to secure 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 at the time of registration.

EVENING SCHOOL


The Division of Technology, with the cooperation of other departments, operates Evening School Classes in Related Instruction and Trade Extension for veterans training on-the-job as apprentices and trainees, and for other persons employed in trades, industries and business in a variety of occupational fields.

Related Instruction for Apprentices and Trainees

The Evening School Classes in Related Instruction for apprentices are designed to meet the standard requirements of apprenticeship programs for apprentices training on-the-job in the trades. The courses consist of units of study in organized programs extending up to four years in a number of the leading trades. Apprentices, both veterans and civilians, attend the classes in the evening and progress through the succeeding units of study covering the entire program for the trade in which they are training. The Evening School Classes in Related Instruction for trainees are designed to meet the needs of veterans and others training on-the-job in industrial and business occupations. The courses consist of units of study in organized programs extending up to two years in a variety of occupational fields in industry and business that are not included among the apprenticeable occupations.

The subject material in Related Instruction is functionally related to the
work in the occupation. Terminal or vocational credit is given on a clock hour basis.

The Journeyman's Certificate is granted to apprentices upon the satisfactory completion of the prescribed program of On-the-Job and Related Training. This is provided through the cooperative effort of the Federal Apprentice Training Service, the Local Joint Apprenticeship Committee or Individual Trainer, and the College, working together in the total program of Apprentice Training.

A Certificate of Completion is granted to trainees in non-apprenticeable occupations upon the satisfactory completion of their prescribed program of On-the-Job and Related Training. This is provided through the cooperative effort of the State Department of Vocational Education, the Employer-Trainer, and the College, working together in the total training program.

Related Trade Extension

Evening School Classes are offered on a unit basis to journeymen and other workers in the trades and industries. These consist of short intensive unit courses designed to meet the needs of workers in the field.

Registration for Evening School Classes in Trade Extension is on a clock hour basis and is open to adult workers who can profit by them.

Fields Covered by the Evening School Program

Courses will be organized and offered in any occupation in which ten or more students enroll for them.

The Evening School program at present includes courses varying from short units of two to six weeks to comprehensive courses covering up to four years in the following occupational fields: Accounting, Air Conditioning and Refrigeration, Auto Body Repairing, Auto Mechanics, Blacksmithing, Carpentry, Clerical Work, Electricity, Machine Work, Office Management, Store Management, Meat Cutting, Millwork and Cabinet Making, Plumbing and Steamfitting, Radio, and Selling.

For further information see the Evening School Catalogue.
THE Branch Agricultural College of Utah marks the date 1897 as the year of its founding. Its first service to the state was listed under the title of 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. Occasion for additional training for the youth of Southern Utah was thus opened. Through new college 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 Branch Agricultural College courses parallel those of the lower division of the parent institution.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Senior 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 Extension Service and the Agricultural Experiment Station are closely connected with the B. A. C., and certain members of the resident staff at Cedar City are also members of the staff of these two divisions. The deans of the parent institution supervise closely the work of the corresponding divisions here.
### Fifty-fifth ANNUAL COMMENCEMENT

**Graduate School**

#### CERTIFICATES OF COMPLETION

##### Two-Year Vocational Course in Agriculture

- **Carver, Royal Thair**

<table>
<thead>
<tr>
<th>Course in Air Conditioning and Refrigeration</th>
<th>Names</th>
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<tbody>
<tr>
<td>Two-Year Vocational Course in Air Conditioning and Refrigeration</td>
<td>Campbell, Lyle P.</td>
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<td>Cook, William R.</td>
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<td>Cowley, Donald L.</td>
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<td>Davis, George Taylor</td>
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<td>Tripp, Richard D.</td>
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##### Two-Year Vocational Course in Automotive Repair

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<tr>
<th>Cox, Jay Taylor</th>
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<tr>
<td>Griffin, Seth Dee</td>
<td>Ransom, Reese</td>
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<td>Hoffmann, Merrill V.</td>
<td>Romero, Arnold H.</td>
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<td>Larson, Don C.</td>
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##### Two-Year Vocational Course in Carpentry

<table>
<thead>
<tr>
<th>Davis, Robert H.</th>
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<tr>
<td>Fletcher, Harvey R.</td>
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<td>Foreberg, Sylvan</td>
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<td>Nichols, Marel Bud</td>
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##### Two-Year Vocational Course in Commercial Photography

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##### Two-Year Vocational Course in Diesel and Heavy Duty Mechanics

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<tr>
<th>Wilkins, Russell Mack</th>
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### BACHELOR OF SCIENCE DEGREES

#### Agriculture

<table>
<thead>
<tr>
<th>Archibald, Delos Boyd</th>
<th>Edwards, William Homer</th>
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<tr>
<td>Bagley, David Cyrene</td>
<td>Fieldsted, Dewilton E.</td>
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<td>Baker, Laurence O.</td>
<td>Gibson, William I.</td>
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<td>Bateman, Kenneth George</td>
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<td>Bickmore, William D.</td>
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<td>Bishop, Shirley E.</td>
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<td>Bodell, Joseph J.</td>
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<td>Lambert, Maurice R.</td>
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<td>Law, Jay Basil</td>
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<td>Matthews, Darrell Hymas</td>
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<td>McCullough, Rex M.</td>
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<td>Michelsen, Myles A.</td>
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<td>Milam, Leslie E.</td>
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<td>Mockli, Leo</td>
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<td>Morrill, Horace LeRoy Jr.</td>
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Buck, Rulon Wendell
Bussio, Mario B.
Butters, Lee W.
Butters, VerNon
Christensen, Seymour Kent
Church, Warren Harvey
Clark, Clark R.
Clark, Ward R.
Cook, Douglas Merlin
Crane, Leonard Heber
Crowther, Edward Neal
Daniels, Paul R.
Drake, J. Raman
Duce, LaVon F.

Havens, W. Winston
Hedrick, Clarence F.
Hellstrom, Carl Fredrick
Herring, Jack W.
Heslop, J. Malan
Hunsaker, Richard Charles
Hurst, Elden Grant
Hurst, Rex LeRoy
Jackson, Ned Roy
Jackson, Ross D.
Jarrett, Von Howell
Jensen, Loy Maughan
Johnson, Howard M.
Johnson, Lin Holmes
Johnson, Walden Weaver

Mortenson, Roy K.
Ogden, Lloyd Warren
Oldham, Albert E.
Rasmussen, Garth B.
Rasmussen, Warren Willard
Sleight, Lynn G.
Stephenson, Robert L.
Stocking, John A.
Taylor, Herbert Guy
Thornley, George R.
Told, Morris Bill
Waddoups, Horace Marr
Whitmer, Lyle Edward
Winger, Leland J.
Zohner, Daniel R.

Aland, Hazel E.
Alder, Zane G.
Anderson, William W. Jr.
Atkinson, Chester J.
Bagley, Royal Anderson
Barraclough, Edmund Lee
Baxter, Jay Darwin
Beck, Frank Preston
Bergeson, Glenn B.

Bickmore, Ilene
Bird, Minnie Lou
Brough, Franklin Keith
Brough, Kathryn Joan
Bowine, John "D"
Cannell, Glen Horace
Canning, Benjamin C.
Carden, Lulu West
Chandler, J. Wilbur
Choate, Robert Calvin
Christensen, Janice Pixton
Christianensen, Bernice Ann
Condie, Wilmar Wilson
Crosbie, Ervin Robert Jr.
Denning, Helen C.
Donavan, Jack H.
Engberg, Charles Munroe
Eschenberg, Christina M.

Everton, Dorothy
Fife, Wynn B.
Francisco, Jack L.
Gardner, Paul Leon
Green, Winifred B.
Gardner, Willard Hale
Groves, Lucille Kemp
Hale, Lyle A.
Hammond, Robert Grenfell
Haws, Byron Austin
Hayward, Alton Mae
Henderson, Ruth Arlene
Hodges, Ethel Jones
Hulse, LuDean Griffin
Jackson, H. Beverly
James, Garth A.
Jenson, John Monroe
Johnson, John Darold
Jolley, Lorna
Knutson, Barbara A.
Larsen, Jordan L.
Linton, Denton C.

Lockhart, Oliver Eldon
Loosle, Beth
Lucherini, VeLoy
McBride, Lee B.
McDonald, Doris B.
McDonald, John William
Merrill, Margaret
Miller, William S.
Myers, Elizabeth MacKinnon
Nelson, George Julius
Nelson, K. LeRoi
Nielson, Christian P.
O’Donnell, Edward Hays
Olsen, Donald Ray
Olsen, Evelyn J.
Olson, John E. Jr.
Parker, Cleone Pixton
Petersen, Ramona
Pilgrim, Arthur J.
Pitcher, Seletta Morris
Popov, Boris H.
Reader, John Nelson
Redford, H. E. D.
Reese, Lois Palmer
Rich, Wayne R.
Rigby, Mark Dale
Rohde, Ralph R.
Salisbury, Kathryn Jean
Shaw, Richard Joshua
Shupe, James LeGrande
Smith, Dona Claire
Sperry, George William
Stringham, Betty
Taylor, Burton L.
Taylor, Earl John
Thornock, Lillian Patterson
Veigel, Eldene
Welch, Julia Mae
Welitt, Robert Daniel
White, Florence Henderson
Whitlock, Beth Ann
Will, Drake Webster
WOolley, Coleen
Wright, Elved C.
Wrigley, John Thomas
LIST OF GRADUATES

Commerce

Abrams, Milton Charles  
Anderson, Desmond L.  
Anderson, Kenneth A.  
Anderson, Richard Dale  
Angus, Edwin H.  
Antonietti, Domenick  
Barber, Charles R.  
Barron, June S.  
Bateson, Elaine Nelson  
Bateson, Russell B.  
Bennion, Stanley  
Benton, Lloyd Jay  
Berry, Robert Lee  
Bertagnole, M. Ruth  
Bird, Leora Callaway  
Bialsdell, Ray  
Bohon, Dennis B.  
Boylston, William E.  
Brothers, Ella Haynie  
Buckley, Emel Joseph  
Bullen, John Dale  
Caldwell, Karl Walter  
Caldwell, Mae Bigler  
Cardon, Sidney B.  
Carter, Royden V.  
Champlin, Zachary T.  
Christensen, Wilford Boyd  
Christensens, Melba  
Clark, Grace  
Coomber, Melburn M.  
Crowther, William Gordon  
Curits, Warren G.  
Dance, Harold Wintle  
Davis, Roy Bigler  
DeWitt, Donald F.  
Dibble, Harold Kent  
Earl, Barbara  
Emmet, Roland Dudley  
Ericksen, Virginia  
Farr, Marilyn  
Flamm, Lowell Stufter  
Freeman, Alf Don  
Frischknecht, Reed Lund  
Fuhriman, Rex Tibbits  
Gardiner, June H.  
Hardy, Charles Harold  
Harmon, Mont Judd  
Hatch, Barbara Moss  
Hendricks, Carol Dawn  
Higbee, Arthur L.  
Horrock, Charles Ray  
Hulme, Melvin J.  
James, Raymond  
Jenkins, Thomas Sparks  
Jacobs, Faye Sessions  
Jenson, Robert W.  
Johns, Evadene  
Johnson, Joseph Junior  
Kunz, Elva Huff  
Kunz, Thelma  
Lowe, Richard Holling  
Lund, Maxfield F.  
Madsen, Gordon Keith  
Mathews, Ellen LaRae  
Matney, Thomas W.  
Maughan, Richard J.  
Merrill, D. Gordon  
Metcalfe, Donald J.  
Miller, James Homer  
Miller, John Calvin  
Murdock, Pauline Clemens  
Nelson, Ina Shepherd  
Nelson, Newell A.  
Nielson, LaRue  
O'Brien, Timothy E.  
Odekirk, W. L.  
Pickett, Nola Agricola  
Plowman, Rex G.  
Picker, Ronald Villis  
Rigby, Alma Bartlett  
Richards, Ralph John  
Roberts, David B.  
Sanddal, Charlotte Jean  
Sanddal, James Wesley  
Sargent, Elma Rose  
Schott, Mary Jean  
Schulz, Edwin E.  
Schvaneyldt, Gordon Lee  
Sonne, Norman Lee  
Stephens, Lucille E.  
Thomas, Dorothy Rae  
Thomas, Owen Robert  
Tibbitts, Floyd Farel  
Tingey, Joan Darlene  
Turner, Byron L.  
Warr, Mal E.  
Watkins, Norman B.  
Wubb, Roy G.  
West, Quentin Mecham  
Whiting, Glen Austin  
Wilson, Helen

Education

Adams, Ardes  
Ainsworth, Keith H.  
Allred, Dale Leroy  
Baker, Alfred M.  
Barker, Donna  
Barlow, Wanda  
Barnes, Charles Edward  
Barney, Vernon S.  
Beck, Amy Lazenby  
Belnap, Garth R.  
Birch, Gray Adair  
Blaylock, Marian Alton  
Bonitsak, Willis Leon  
Boox, Clifton D.  
Brimhall, Betty Ellen  
Brockbank, Nord "O"  
Bult, Douglas Keith  
Bunderson, Alton K.  
Burton, Alma P.  
Butler, Karl N.  
Carter, Marilyn  
Checketts, Arleta  
Christensen, A. Lavon  
Christopherson, Lawrence C.  
Clayson, Keith Edward  
Conroy, Mary Carmen  
Crane, Ella  
Dalley, Winell  
Daniels, John Stives  
Dunn, John W. Jr.  
Dunn, Simeon A.  
Eckenbrecht, Theresa K.  
Englestead, Ray G.  
Eppich, Irel M.  
Eyre, Vern Bingham  
Facer, James Paul  
Freeman, Glen Ralph  
Fulmer, Thomas H.  
Funk, Lilla Rae  
Goodwin, Lois Sorensen  
Gordon, Vaughn W.  
Hall, Rda Mae  
Hammond, Claire L.  
Hansen, Dona Burgoyne  
Hansen, Rulan S.  
Hawkes, Glenn Rogers  
Heath, Ted  
Henderson, Ralph D.  
Hill, Wesley S.  
Hughes, Gladys  
Hunsacker, Marybelle  
Jaussi, Junior L.  
Jepps, Dean Robert  
Jenkins, Grant B.  
Jenkins, Louise Irene  
Jensen, Edmond C.  
Jensen, Ronald F.  
Jeppson, Marie Thorne  
Johnson, Jane  
Johnson, Ruby Pearl  
Jones, William Emrys  
Kobe, Jack E.  
Kunzler, Norma  
Lagos, Florence  
Laursen, Douglas O.  
Lindsey, Kenneth P.
Luke, Utahna
Madsen, Joseph Dale
Martin, Barbara Louise
Mays, Barbara
McCaryy, Laura Louise
McCloy, Paul D.
McCoy, Joseph A.
McCullough, Allan H.
McMullin, Laurel
Miles, Ora
Morrill, Anna Olsen
Nielsen, Robert A.
Nutting, Barton Glenn
Olney, Cless L.
Packer, Allen H.
Paice, Erma

Parker, Clarence P.
Pavalunas, Matt W.
Pavillon, Melene H.
Polson, Frances Pearl
Quayle, John W.
Rhees, Leland W.
Richards, Parker E.
Rist, Alpha Lee
Roberts, LeRoy M.
Russell, Mary Ellen
Sanders, Melvin George
Slack, Paul Holt
Smith, Elaine
Sorensen, Mary Jean
Stevenson, Shirley Mae
Stock, Kathryin Virginia
Tankersley, Thelma Laddell

Taylor, Roger E.
Thomas, Luella Martha
Tschanz, Patricia Ann
Walker, Reed L.
Watters, Ray
West, Josephine
West, LeRoy L.
Whatcott, Leola
Whitby, Jennie
Williams, Frank Ralph
Willie, Dorothy Louise
Wilson, Wilma Ellis
Wood, Audrey, P.
Woodbury, Jack W.
Zimmerman, Glenn R.

Agricultural Engineering
Bassett, Day LaMar
Christiansen, J. Y.

Civil Engineering
Baxter, John Alden
Bench, Sterling E.
Berbert, Henry Jarvis
Bergstrom, Airus E.
Bigler, Kenneth D.
Blanthorn, Chester Robert
Blaser, Harold D.
Carter, Lee Wallace
Dunn, Irving S.

Pack, Philip Walter
Palmer, Byron C.
Pehrson, Paul J.
Searl, Gilbert P.
Shelton, V. Douglas
Smart, Eugene Ren
Smith, Carl L.
Stalwick, Roy William
Woodward, Kenneth L.

Industrial Education
Beecher, Vern R.
Bird, Arus William
Carlson, Fredisck John
Griffin, Earl H.
Griffiths, Weldon J.
Hailes, Charles William

Kuhni, Paul J.

Robins, Richard W.
Skidmore, William A.
Stanley, Daryl H.
Wallis, Donald E.

Industrial Technology
Burns, Robert Ensign
Floyd, Fernando
Hansen, Robert Eugene

Orton, Clarence Max
Silver, Ralph Taylor
Thompson, Jack Boyd

Somers, Willford Karl

Radio Technology
Larson, Lavon Freeman
McKell, William E.
Memmott, Bryce W.
Nielsen, Jay Leland
Parker, E. Moyle
Petersen, Wendell Jay

Wolfinden, Duard S.

Forest Management
Ballenger, Cecil
Evans, Samuel S., Jr.
Hoffman, Reuben

Large, Jackson D.
Miller, Warren S.
Pirsko, Arthur Russell

Ray, Hurlon Conwell
Safran, Robert Louis
Woolley, Joseph Tarbet

Range Management
Benson, Matthew C.
Brownstein, Alexander G.
Cox, Edward Dyreng
Heaton, Gordon L.

Johnson, Joe Chilton
Jolley, Sidney William
Klassen, William Carl
Later, Wendell C.

McClure, Gilbert D.
Sharp, Lee A.
Simpson, Albert L.
Sveinsson, Pall
LIST OF GRADUATES

Wildlife Management

Duncan, Gerald Edward  Rawls, Charles Keslo Jr.  Tripp, George William
Elgan, Grover F.  Stoddard, Carl Ray  Walker, Vance DeMont, Jr.
Nelson, Wilford O., Jr.  Sutch, Tony

Home Economics

Bagley, Marian M.  Fischer, Helen Jean  Pugmire, Dorothy Jean
Ball, Barbara Donnell B.  Gardner, Elizabeth Louise  Ralphs, Fae C.
Bateman, Carol  Gnehm, Lillie  Redd, Jessie Mae
Berrey, Vivian  Hall, Colleen  Rich, Gene Munns
Bishop, Doris Ann J.  Hickman, Marian Vee  Roberts, Elayne R.
Brown, Joyce  Hill, Beth Elaine Powell  Russell, Athleen Renae
Burnham, Beverly  Hillyard, Marva Lu  Shepherd, Edith Alice
Carter, Alta  Holt, Josephine  Snell, Jacqueline
Christiansen, Betty Mae H.  Johnson, Ann Wheelwright  Sorensen, Florence S.
Crowther, Helen Norma  Lamprecht, Helen  Speierman, Helen Leona
Daines, Norinne  Larsen, Marie  Spencer, Sarah M.
Ebgrt, Joyce  Later, Vera Mae N.  Stimpson, Sue Hansen
Erickson, Elizabeth  Lopez, Naomi Pearson  Swainston, Beth
Feulner, June  Miller, Onda  Thomas, Irene Olsen
Fielding, Mildred E.  Murphy, Ruth Gilbert  Walters, Jayne Ruth
Fife, Norca Agnes  Paxton, Merlene  Whitby, Louise

GRADUATE CERTIFICATE IN SOCIAL WORK

Anderson, Nathan Hale

MASTER OF SCIENCE DEGREES

GEORGE H. ABEL, JR., Agronomy—“The Relation of Growth to Rubber Production in Guayule (Parthenium argentatum Gray).”

LAVERNA HEATON ALLEN, Education — “A Study of the Reading Habits of Parents in a Utah College Community.”

CHALL ALLRED, Agricultural Economics — “The Cost of Producing Eggs in Utah, 1946.”


JOHN O’DEEN ANDERSON, Speech — “A Study of a Remedial Speech Program in Operation in Four Rural Schools in Utah.”

WILLIAM HUNTER BENNETT, Agronomy — “A Study of Variability in Alfalfa Varieties with Respect to the Nitrogen Content.”

FREDERICK BISAL, Soil Physics — “Siphon Drainage.”

VERNAL REID BISHOP, Zoology — “Fluctuations in numbers of Trichomonas Foetus Occurring in the Preputial Cavity of Bulls.”

ROBERT B. BRADSHAW, Education — “The Maturation of Vision as Determined by Measurements of Refractive Errors with the Ophthalmic Telebinocular.”


H. JESS BROWN, Education — “The Construction of a Scale to Measure Attitudes toward a Twelve-Month School and Work Program in the Secondary Schools of Utah.”

CASEEL DELORE BURKE, Education — “A Study of the Need for Supervision of Instruction in the High Schools of Utah.”

LAUREN M. BURCH, Soil Science — “The Effect of Light, Soil temperature and Soil moisture on High-lime chlorosis.”

AUSTIN BERT CASEMAN, Civil Engineering — “Analysis of a Three-span Rigid-frame Bridge.”

BEATRICE JESSOP CARROLL, Sociology — “Public Recreation in Logan, Utah.”
PEARL J. CARTER, Education—"An Analysis of Library Services in Nine selected Elementary Schools in Northern Utah."

JACK CHATELAIN, Physics—"Thermodynamics of Soil Moisture."

PAUL DRIGGS CHRISTENSEN, Soil Science—"Crop Response to Applications of Copper Sulfate on Salty Soils."

DEAN CHRISTIAN CHRISTENSEN, Education—"Effectiveness of Music Teaching at the Sixth Grade Level under the Platoon System, the Supervised System, and the Non-supervised System."

STERLING DAVIS, Civil Engineering—"The Drainage Problem in the Lewiston Area, Utah."

WILLIAM R. DOBSON, Psychology—"Elements of Personality Maladjustment Among Freshmen Students Entering Utah State Agricultural College, 1947."

ERVIN REES EDMUNDS, Poultry Breeding—"Some effects of record of Performance Standards of Selection as Applied to Four Utah Breeding Flocks (1936-1946)."

ROBERT LINDSAY EGBERT, Psychology—"An Evaluation of the Guidance Tests Given at the Utah State Agricultural College for the Year 1946-1947."

NORMAN A. EVANS, Agricultural Engineering—"Resistance of Compacted Earth Materials When Used as Canal Lining."

DEAN CHARLES FLETCHER, Physiology—"Factors Affecting Hatchability in Turkey Eggs."

ARTHUR JAMES GODFREY, Agricultural Education—"A Study of the Problems of Beginning Teachers of Vocational Agriculture."

LISLE ROYAL GREEN, Range Management—"Study of Utilization of Southern Utah Winter Range Plants by Sheep."

MELVIN LESTER GRUWELL, Education—"An Evaluation of School Budgetary Procedure in Minidoka and Power Counties, Idaho."

ELDON G. HANSON, Civil Engineering—"Design and Maintenance Problems of Utah Drainage Districts."

LUCY VALERIA HEATON, Education—"A Study of Adult Reading in a Selected Rural County of Utah."

GORDON ANDREW HOBBS, Entomology—"Insect Pests and Predators in Relation to Alfalfa Seed Setting in Southern Alberta and the effects on these Insects of Three Hydrocarbons."

DONNA M. HOGGE, Physical Education—"A Study of the Dance in the Church of Jesus Christ of Latter-day Saints."

WILLIAM AUBREY HUBBARD, Range Management—"Some Soil-Plant Relationships in Southern Alberta Grasslands."

MARIAN F. LARSEN, Agricultural Economics—"An Analysis of Consumer's Preferences for Peaches in Salt Lake City, Utah, 1947."

AUBREY MILFORD LAWRENCE, Chemistry—"The Reaction of Potassium Persulphide with Copper and Zinc."

DALE A. LEWIS, Physical Education—"A Study of Intercollegiate Tennis within the Senior Colleges and Universities of the Mountain States Intercollegiate Athletic Conference."

GLEN L. MAUGHAN, Physical Education—"An Evaluation of the Health and Physical Education Programs in Southern Idaho."

RALPH B. MAUGHAN, Physical Education—"A Study of the Utah State Agricultural College Male Physical Education Graduates from 1926 to 1947."

DEVERE RICHARD McALLISTER, Agronomy—"The Tolerance of Certain Pasture Plants to Salty Soil Conditions."

BETSEY ROGERS McCULLOUGH, Psychology—"The Effects of Serial Testing Upon the Results of the Standard-Binet Tests of Intelligence."

DEAN MERRILL MCDONALD, Sociology—"Family Problems in Brigham City, Utah, 1946."

ERNEST H. McLIVAIN, JR., Range Management—"Differential Germination and Growth Response of Some Important Grass and Forb Seeds After Treatment with 2.4-dichlorophenoxyacetic acid and diesel oil."
LLOYD EUGENE MELDRUM, Animal Nutrition—"The Effect of Feeding Various Supplements to Sheep on the Winter Range."

THAN MYINT, Animal Nutrition—"The Effects of D.D.T. on the Composition and Digestibility of Alfalfa Hay."

DALE O. NELSON, Physical Education — "A Study of High School Physical Education Accident Insurance Programs."

GLEN T. NELSON, Agricultural Economics—"Membership Relations of the Utah Poultry and Farmers' Cooperative."

KEITH RONALD OAKES, Education—"Student and Teacher Judgment of the Effectiveness of College Teaching."

ELLAF ARNI OLAFSON, Civil Engineering—"A Study of Land Drainage by an Experimental Drainage Well in the Delta Area, Utah."

NaRAY H. ORMOND, Dairy Manufacturing—"Relative Position of Moisture in Cheddar Cheese."

MELVIN M. PETERSON, Agricultural Economics—"A Farm Management Study of Dairy Farms in Duchesne County, Utah, 1945."

CLAIR HAYDEN PORTER, Animal Production—"A Record of Performance and a Study of the Relationship of Various Body Measurements to Rate and Efficiency of Gain in Beef Cattle."

FRED V. PORTER, Education—"A Study of Factors which Determine the Effect of Unit Size on the Efficiency and Value of Offering in High Schools."

PARKER F. PRATT, Soil Science—"Solubility and Physiological Availability of Phosphates in Sodium and Calcium Systems."

WENDELL O'NEAL RICH, Education—"A Proposed Audio-Visual Aids Program for the Small-City School System."

REED STEWART ROBERTS, Entomology—"Lygus Bug Infestations as a Factor Affecting Flowering and Pollination in Alfalfa."

DARYL B. SIMONS, Civil Engineering — "The Design of a Symmetrical Open Spandrel Reinforced Concrete Arch."


ALLEN SUTHERLAND, Nutrition — "Dietetics in Puppetry Land; Teaching of Nutrition Through a Correlated Program."

GEORGE F. SWENSON, Speech Pathology—"A Comparison of Speech Defects Found Among Pupils of the Third to Sixth Grades Inclusive of an Urban With a Rural Area in Cache County, Utah."

ARNOLD TAYLOR, Agricultural Economics — "The Cost of Producing Peaches in Utah County, 1947."

WAYNE GIBSON TAYLOR, Physical Education—"A Survey of the Requirements for Boys in Physical Education in Region One High Schools of the Utah State Athletic Association."

TED TIBBETTS, Entomology—"Life History and Control of the Sheep Tick, Melophagus ovisculus Linn, in Northern Utah."

GORDON ALMON VAN EPPS, Agronomy—"The Influence of Fertilizers on Yield of Tomatoes and on the Concentration of Nitrogen and Soluble Phosphorus in the Petiole Tissue."

WILLIAM CHARLES WINDER, Dairy Manufacturing—"A Study of Some Variable Factors in the Analysis of Cheddar Cheese."

STEPHEN LANE WOOD, Entomology — "A Taxonomic Study of the Scolytidae (Coleoptera) of the Logan Canyon Area of Utah."

HONORARY DEGREE OF DOCTOR OF LAWS

Cardon, Philip Vincent        Howell, James Albert
## SUMMARY OF ATTENDANCE

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