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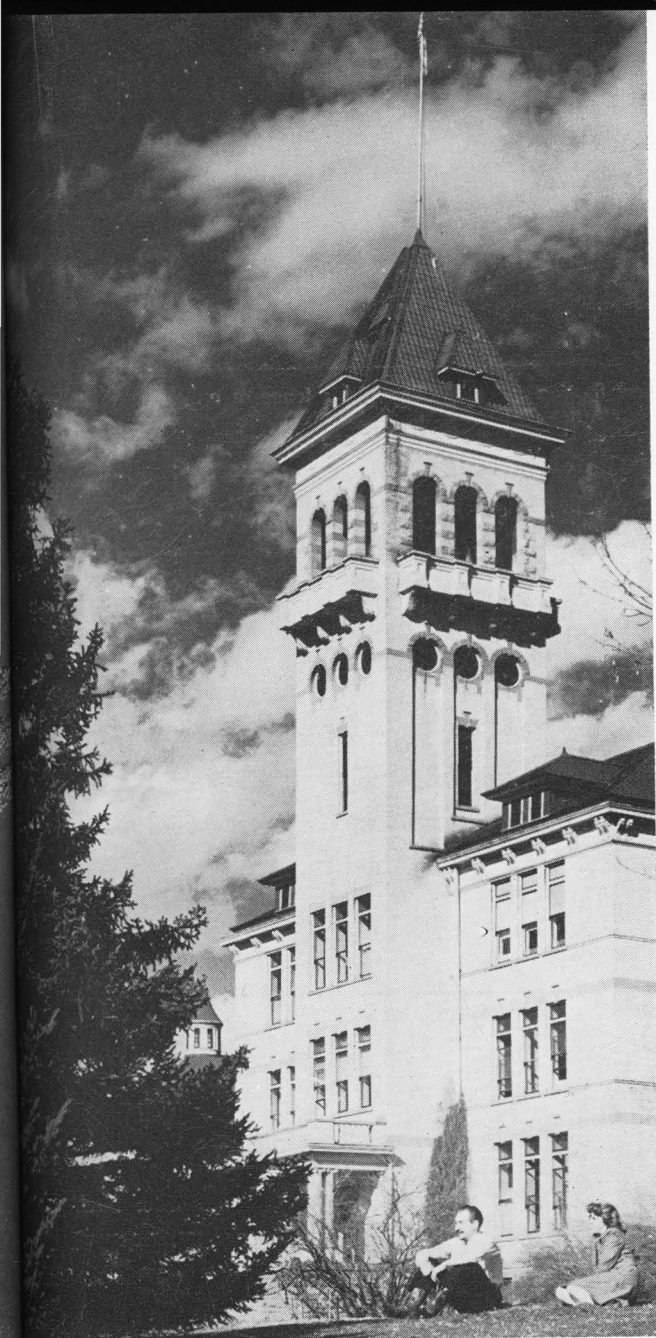
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# UTAH STATE Catalog 1954 • 55

Utah State Agricultural College

BULLETIN

Vol. 54

May, 1954

No. 5





With Utah Agricultural Experiment Station located at USAC, School of Agriculture students may work with many of the country's top scientists.



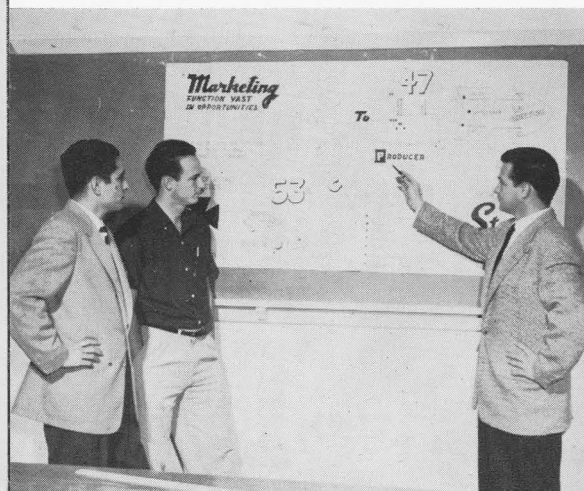
Physical science is only one of a variety of fascinating subjects and occupations which are studied in the School of Arts and Sciences.

## The Goal of Utah's Land-grant College:

*"... to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."*

From the Morrill Act which Abraham Lincoln signed in 1862 to found the Land-grant Colleges of America.

The School of Commerce trains students for leadership in many fields of endeavor in business and industry.



Recreational leadership is taught in the School of Education, as are music, art, psychology and teacher training.



**UTAH STATE  
AGRICULTURAL COLLEGE  
BULLETIN**

**Catalog Issue  
1954-55**

**When You Come to Register  
Please Bring This Bulletin With You**

COLLEGE BULLETINS, Published by Utah State Agricultural College, at Logan, Utah. Issued Monthly. Vol 54, No. 5, May 1954. Entered as second class matter September 10, 1918, at the post office at Logan, Utah, under the act of August 14, 1912. Acceptance for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917. Authorized August 22, 1918.

Published by the College  
1954

**LOGAN, UTAH**

Printed in the United States of America

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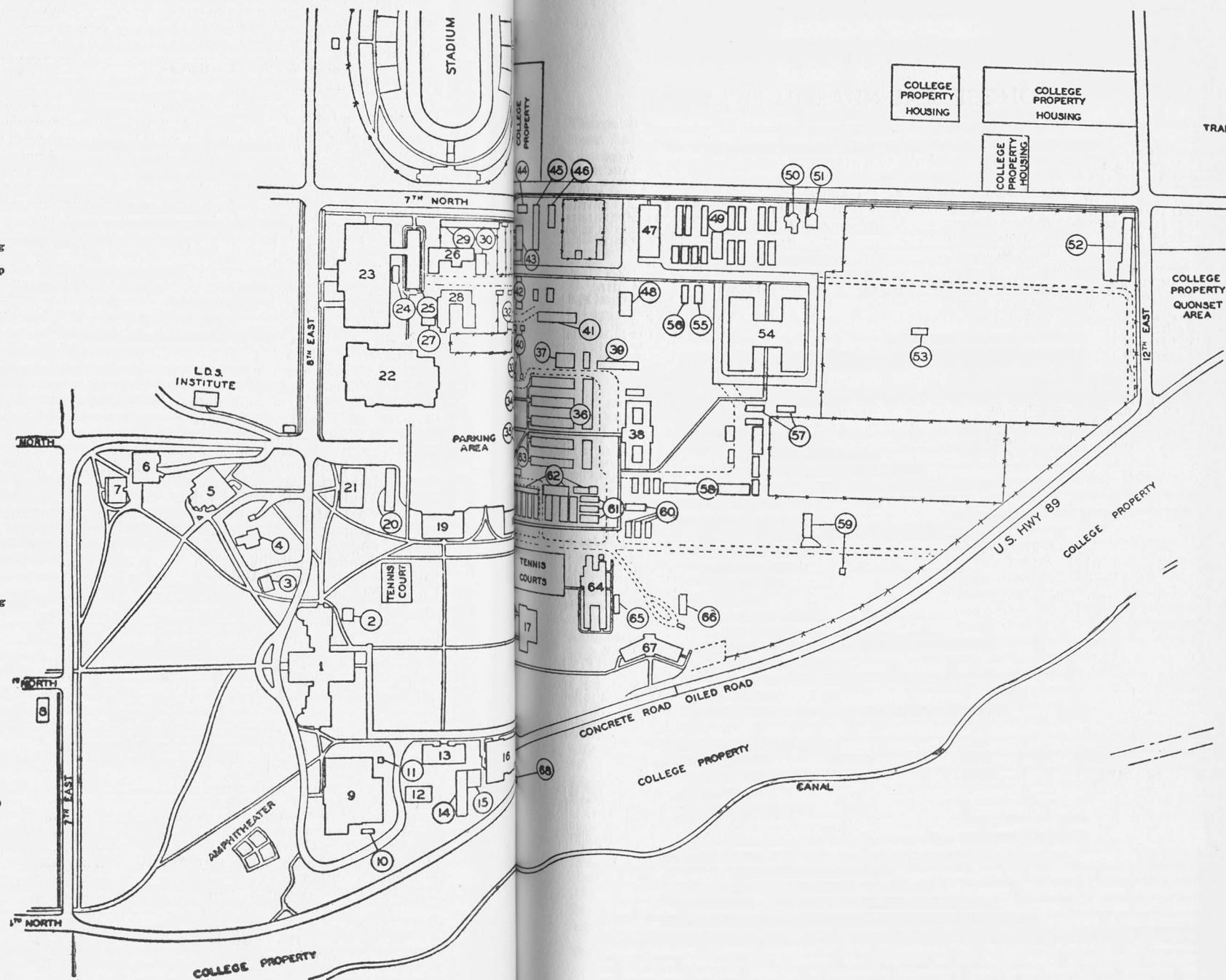
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# LOCATION OF BUILDINGS

- 1 Main Building
- 2 Art Barn
- 3 Extension Service
- 5 Smart Gymnasium
- 6 Boiler House
- 7 Forestry Building
- 8 Practice Cottage
- 9 Mechanic Arts
- 10 Chemical Storage Building
- 11 S. C. S.
- 12 Research & S. C. S. Shop
- 13 Engineering Building
- 14 Farm Mechanics Shop
- 15 Hydraulics Tank
- 16 Home Economics Building
- 17 Library
- 18 Plant Industry Building
- 19 Animal Industry Building
- 20 Chemistry Building
- 21 Widtsoe Hall
- 22 Union Building
- 23 Field House
- 24 Military Storage
- 25 Military Science Building
- 26 Sheep Barn
- 27 Cow Shed
- 28 Cow Barn
- 29 Sheep Sheds
- 30 Sheep Shed
- 31 Horse Barn
- 32 Shed
- 33 Storage
- 34 Garages
- 35 Horticulture
- 36 Temporary Buildings
- 37 Boiler House (T-Bldg.)
- 38 Rural Arts
- 42 Poultry Building
- 43 Veterinary Science Building
- 44 Veterinary Science Lab.
- 45 Veterinary Science Lab.
- 46 Veterinary Science Lab.
- 47 Maintenance Building
- 48 Stock Judging Pavilion
- 49 Equipment Storage
- 50 Co-op Building
- 51 Nursing
- 52 U.S.F.S. Equipment Shed
- 53 Radio Lab.
- 54 Technology Building
- 55 Book Bindery
- 56 Equipment Storage
- 57 Automotive Storage
- 58 Storage (Exper. Sta.)
- 59 Nursery (Forestry)
- 60 Storage (Forestry & Ext.)
- 61 Storage
- 62 Greenhouse
- 63 Storage (Greenhouse)
- 66 Storage (Lund Hall)
- 67 Lund Hall
- 68 Concrete Water Tank





# COLLEGE CALENDAR 1954-55

## 1954 SEPTEMBER

S	M	T	W	T	F	S
—	—	—	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	—	—

## 1954 OCTOBER

S	M	T	W	T	F	S
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	—	—	—	—	—	—

## 1954 NOVEMBER

S	M	T	W	T	F	S
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	—	—	—	—

## 1954 DECEMBER

S	M	T	W	T	F	S
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
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## 1955 JANUARY

S	M	T	W	T	F	S
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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	—	—	—	—	—

## 1955 FEBRUARY

S	M	T	W	T	F	S
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	—	—	—	—	—

## Fall Quarter

Sept. 20, Mon.	First faculty meeting.
Sept. 23, Thurs.	Guidance tests for new students.
Sept. 24, Fri.	Registration, former students.
Sept. 25, Sat.	Registration, new students.
Sept. 27, Mon.	Instruction begins.
Oct. 30, Sat.	Homecoming.
Nov. 24, Wed.	Thanksgiving Recess, begins 12 noon.
Dec. 14, Tues.	Examination period begins.
Dec. 17, Fri.	Fall Quarter ends.

## 1955 MARCH

S	M	T	W	T	F	S
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	—

## 1955 APRIL

S	M	T	W	T	F	S
—	—	—	—	—	—	1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	—	—	—	—	—	—

## Winter Quarter

Jan. 3, Mon.	Instruction begins.
Jan. 4, Tues.	Examination period begins.
Mar. 15, Tues.	Winter Quarter ends.
Mar. 18, Fri.	Registration.

## 1955 MAY

S	M	T	W	T	F	S
—	—	—	—	—	—	1
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	—	—	—	—	—

## Spring Quarter

Mar. 21, Mon.	Spring Registration.
May 30, Mon.	Memorial Day (holiday).
May 31, Tues.	Examination period begins.
June 3, Fri.	Examination period ends.
June 3, Fri. eve.	Baccalaureate Service.
June 4, Sat.	62nd Commencement.

## 1955 JUNE

S	M	T	W	T	F	S
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	—	—	—	—	—

## 1955 JULY

S	M	T	W	T	F	S
—	—	—	—	—	—	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	—	—	—	—	—

## Summer Quarter, 1955

June 13, Mon.	Registration for first or both sessions.
June 14, Tues.	Instruction begins.
July 4, Mon.	Independence Day (holiday).
July 22, Fri.	First session ends.
July 25, Mon.	Pioneer Day (holiday).
July 26, Tues.	Second session begins.
	(Registration for second session at any available hour during first week.)
Aug. 26, Fri.	Second session ends.

## 1955 AUGUST

S	M	T	W	T	F	S
—	—	—	—	—	—	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	—	—	—	—	—

## ADMINISTRATION

## Board of Trustees

Thorpe B. Isaacson, Chairman .....	Salt Lake City
Reed Bullen, Vice-Chairman .....	Logan
Charles R. Hunter .....	Cedar City
Carl W. Petersen .....	Kenilworth
Fern B. Ercanbrack .....	Provo
George D. Preston .....	Logan
Newell V. Sanders .....	Kaysville
Roger Armstrong .....	Ephraim
George M. Fister .....	Ogden
J. V. McLea .....	Roosevelt
R. J. Potter .....	Garland
LeGrand Richards .....	Salt Lake City
Lamont F. Toronto, Secretary of State (ex officio) .....	Salt Lake City
R. O. Porter, President Alumni Association (ex officio) .....	Logan
L. Mark Neuberger, Secretary to the Board .....	Logan

## Officers of Administration

Henry Aldous Dixon .....	President
L. Mark Neuberger .....	Executive Assistant to the President
Dee A. Broadbent .....	Business Manager
R. H. Walker .....	Director, Agricultural Experiment Station, and Dean, School of Agriculture
Carl Frischknecht .....	Director, Extension Service
Daryl Chase .....	Director, College of Southern Utah
Lester B. Whetten .....	Director, Snow Branch College
Ernest A. Jacobsen .....	Dean, School of Education
Lewis M. Turner .....	Dean, School of Forest, Range, and Wildlife Management
Carlton Culmsee .....	Dean, School of Arts and Sciences
Ethelyn O. Greaves .....	Dean, School of Home Economics
Milton R. Merrill .....	Dean, School of Commerce
J. E. Christiansen .....	Dean, School of Engineering and Technology
J. Stewart Williams .....	Dean, Graduate School
John C. Carlisle .....	Dean, Summer School
C. Jay Skidmore .....	Acting Dean of Students
Mae Welling .....	Dean of Women
John Roning .....	Director of Athletics
W. H. Bell .....	Registrar
King Hendricks .....	Director of Libraries
LeRoy Blaser .....	Chairman, Public Information and College Development; Executive Secretary, Alumni Association
Lee Grande Noble .....	Director, Extension Classwork and Home Study
Sylvan Erickson .....	Controller
Dean Eyre .....	Purchasing Agent
Harold M. Wadsworth .....	Superintendent of Buildings and Grounds
Glenn Blaser .....	Manager, Student Union Building
Ben Van Shaar .....	Manager, College Housing
Asa Beecher .....	Veterans Coordinator

The Administrative Council consists of the President, his Executive Assistant, all Deans, the Business Manager, the Registrar, the Directors of the Agricultural Experiment Station, the Extension Service, Division of Extension Classwork and Home Study, the Director of Public Information and College Development, the Director of the Libraries, Director of Athletics, President of the Faculty Association.



## Faculty Committees

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

**Agenda**—Blanch, Vickers, Murray, Oakes, Stoddart.

**Assemblies**—Dean of Students and Student Representatives.

**Athletic Council**—H. A. Dixon; Hendricks, Chairman; Neuberger; D. A. Broadbent; Roning; H. B. Hunsaker; Col. Partin; Skidmore; R. Bullen; L. Blaser; G. Caine; J. E. Christiansen; Pres. "A" Men's Association; Studentbody president and vice president; Chairman Booster Club.

**Attendance and Scholarship**—Brite, V. Israelsen, Edwards, Richardson, Major Howard, C. J. Skidmore, Moore, P. Roland, Loveless.

**Awards and Honors**—Ricks, Thomas, Blanch, Kelker, Burke, Page, Hayward, Watkins, Olsen.

**Credits and Admissions**—Sharp, N. S. Cannon, Boyle, Hayward, Jones, Registrar—ex officio member.

**Curriculum**—E. A. Jacobsen, Academic Deans, Carlisle, Williams, Skidmore, Dir. Chase of C.S.U., Dir. Whetten of Snow, and student representatives.

**Debating**—Robinson, Vickers, Hayward, Murray, W. Anderson.

**Foreign Students Advisory Committee**—Black, Drake, Greenwood, Merrill, Meyer, M. L. Nielsen, Thorne, Martin.

**Graduate Council**—Williams, E. Gardner, Murray, Frandsen, M. J. Greaves, Wilcox, Hendricks, Stoddart, Pollard.

**Graduation**—Meyer, Bell, Mortimer, Kelker, J. A. Bennett, Stone, Carter, Vermillion.

**Housing**—....., W. W. Skidmore, Welling, Litz.

**Library**—Hendricks, Academic Deans, Frischknecht.

**Lyceum, Lectures and Concerts**—Holmgren, N. W. Christiansen, D. A. Broadbent, student representatives, Cache Valley Civic Music Association representative.

**Personnel and Guidance**—Skidmore, Welling, Bell, Stone, Burns, Lewis, B. Gardner.

**Pre-medical, Pre-dental, Pre-veterinary Work**—Hammond, Culmsee, Gunnell, Bahler, Binns, Shupe.

**Professional Relations and Faculty Welfare**—M. C. Cannon, H. B. Hunsaker, Gilmore, Stock, Hayward, Cook, W. H. Bennett, Baird, Carter, Burton, Greenwood, Draper.

**Publications Council**—Culmsee, LeRoy Blaser, Vickers, S. P. Andersen, Reynolds, M. L. Nielsen, J. Stewart, Capt. Giel, G. Harrison, Shaffer and student representatives.

**Registration**—Jacobsen, Academic Deans, Registrar, Skidmore, Hayward, H. B. Hunsaker.

**Schedule**—Kelker, Elich, Capt. Long, Fuhrman, D. Nelson, J. O. Anderson, Neuberger, Arrington.

**Student Affairs**—Welling, Skidmore, D. Carter, H. B. Hunsaker, Partin, Student Body President, AWS President, Student Socials Chairman, two students appointed by student council.

**Teacher Placement**—Oakes, Richardson, Mortimer, Cawley, Burke.

**Emeritus Faculty**

**Peterson, Elmer George**, B.S., A.M., Ph.D., LL.D.  
President Emeritus, Director of Special Research (part time)

**Harris, Franklin Stewart**, B.S., Ph.D., LL.D., D.Sc.  
President Emeritus

---

**Agren, Ellen**, B.S., M.A.  
Professor Emeritus, Home Demonstration Agent

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

**Bowen, Edith**, B.S., M.S.  
Professor Emeritus of Education

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

**Christensen, A. L.**, B.S., M.S.  
Professor Emeritus, County Agricultural Agent

**Dalley, Parley**, B.S., M.S.  
Professor Emeritus of Physical Science

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

**Esplin, Alma E.**, B.S., M.S.  
Professor Emeritus, Extension Sheep and Wool Specialist

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

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

**Gardner, Willard**, B.S., M.S., Ph.D.  
Professor Emeritus of Physics

**Geddes, Joseph A.**, A.B., A.M., Ph.D.  
Professor Emeritus of Sociology

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

**Hansen, Reuben**, B.S.  
Professor Emeritus, Extension Service

**Humpherys, L. R.**, B.S.  
Professor Emeritus of Agricultural Education

**Israelsen, Orson W.**, B.S., M.S., Ph.D.  
Professor Emeritus of Irrigation and Drainage Engineering

**Jennings, D. S.**, B.S., Ph.D.  
Professor Emeritus of Agronomy

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

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

- Lund, Nettie B., B.S.  
Professor Emeritus, Extension Service
- Manning, Wm. H., A.B.  
Professor Emeritus of Music
- Martineau, V. L., B.S.  
Professor Emeritus Extension Service
- McClellan, Charles E., A.B., M.A.  
Professor Emeritus of Education
- Newey, Aaron, B.S.  
Professor Emeritus of Metal Work
- Pedersen, N. Alvin, A.B., M.A., Ph.D.  
Dean Emeritus, School of Arts and Science
- Peterson, Henry, A.B., M.A.  
Professor Emeritus of Psychology
- Peterson, William, B.S., D.Sc.  
Director Emeritus, Extension Service
- Preston, William B. III, M.D.  
Professor Emeritus of Physiology
- Richards, B. L., B.S., M.S., Ph.D.  
Professor Emeritus, Botany and Plant Pathology
- Sharp, David, Jr., B.S.  
Professor Emeritus, Extension Service
- Sorensen, Alma Nicholas, A.B., A.M.  
Professor Emeritus of English
- Sorenson, C. J., B.S., M.S.  
Professor Emeritus of Entomology
- Smith, Albert E., B.S.  
Professor Emeritus, County Agricultural Agent
- Stewart, R. H., B.S.  
Professor Emeritus, County Agricultural Agent
- Swenson, D. A., B.S.  
Professor Emeritus of Woodwork and Building Construction
- Thomas, W. P., B.S., M.S., Ph.D.  
Professor Emeritus, Agricultural Economics and Marketing
- Wanlass, W. L., A.B., A.M., Ph.D.  
Dean Emeritus, School of Commerce
- Wrigley, R. L., B.S.  
Professor Emeritus, Extension Service

**Faculty**

**Dixon, Henry Aldous**, B.A., M.A., Ed.D.  
President

**Abrams, Milton**, B.S.  
Extension Librarian, Assistant Professor

**Acord, Clair Reid**, B.S.  
Associate Professor, Uintah County Extension Agent

**Allen, Bert V.**  
Instructor in Photography  
Director of Photographic Service

**Allen, Ira R.**, T/Sgt.  
Instructor in Military Science and Tactics

**Allred, A. Fullmer**, B.S.  
Assistant Professor, Sanpete County Extension Agent

**Allred, Wells M.**, B.S., M.S., Ph.D.  
Assistant Professor of Agricultural Economics and Marketing

**Ames, Ralph W.**, B.S., Ph.D.  
Associate Professor of Botany and Plant Pathology

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

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

**Anderson, Jay O.**, B.S., M.S., Ph.D.  
Associate Professor of Poultry Husbandry

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

**Anderson, Wendell B.**, B.S., M.S., LL.B.  
Assistant Professor of Political Science

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

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

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

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

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

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

**Balding, Lawrence M.**, T/Sgt.  
Instructor in Air Science and Tactics

**Ballard, J. Clark**, B.S., Ph.D.  
Assistant Professor of Horticulture

- Bardwell, Flora H., B.S.**  
Assistant Professor, Home Demonstration Agent, Garfield County
- Barker, James R., B.S.**  
Associate Professor, Extension Irrigation Specialist
- Barlow, Joel C., B.S.**  
Assistant Professor, Assistant County Extension Agent, Utah County
- Bateman, George Q., B.S.**  
Research Associate Professor of Dairy Husbandry
- Bates, George S., B.S., M.A.**  
Collaborator in Teacher Training
- Bauer, Norman, B.S., M.S., Ph.D.**  
Associate Professor of Chemistry
- Beckstrand, Gordon, B.S.**  
Assistant Professor, Emery County Extension Agent
- Beecher, Asa L.**  
Assistant Registrar, Veterans' Coordinator
- Beecher, Vern R., B.S., M.S.**  
Assistant Professor of Automotive Technology
- Bell, William H., B.S., M.S.**  
Registrar, Professor
- Bendixsen, Kay Reed, B.S., M.S.**  
Assistant Professor, County Agricultural Agent, Garfield County
- Bennett, James A., B.S., M.S.**  
Professor of Animal Husbandry  
Head, Animal Husbandry Department
- Bennett, William H., B.S., M.S.**  
Associate Professor of Agronomy
- Bennion, Marjorie P., B.S., M.S.**  
Instructor in Home Economics
- Bergstrom, Helen Evans, B.S., M.S.**  
Assistant Professor, Home Demonstration Agent, Morgan County
- Biddulph, Clyde, A.B., M.Ph., Ph.D.**  
Professor of Physiology
- Biggs, Ernest O., B.S.**  
Assistant Professor, Tooele County Extension Agent
- Binns, Wayne, D.V.M.**  
Professor of Veterinary Science  
Head, Veterinary Science Department
- Bishop, A. Alvin, B.S., M.S.**  
Professor of Irrigation and Drainage Engineering
- Black, Therel R., B.S., M.A., Ph.D.**  
Assistant Professor of Sociology
- Blanch, George T., B.S., M.S., Ph.D.**  
Head, Agricultural Economics and Marketing Department  
Professor of Agricultural Economics and Marketing
- Blaser, Glenn F., B.S.**  
Director, Student Union Building

- Blaser, LeRoy A., B.S., M.S.**  
Director, Public Information and College Development  
Executive Secretary, Alumni Association
- Booth, Thornton Y., A.B., Ph.D.**  
Assistant Professor of English
- Boswell, S. R., B.S.**  
Professor, Utah County Extension Agent
- Boyle, William S., B.S., M.S., Ph.D.**  
Associate Professor of Botany
- Bracklow, Paul E., M/Sgt.**  
Instructor in Military Science
- Brasher, Ruth, B.S.**  
Assistant Professor, Home Demonstration Agent, Carbon County
- Bremmer, Arthur H., Jr., SFC**  
Instructor in Military Science and Tactics
- \*Brite, J. Duncan, B.A., M.A., Ph.D.**  
Professor of History
- Broadbent, Dee A., B.S., M.S.**  
Business Manager, Professor of Agricultural Economics
- Broadbent, Marden, B.S., M.S.**  
Associate Professor, Extension County Agent Leader
- Broman, Harry F., Maj.**  
Assistant Professor of Air Science and Tactics
- Brower, Stephen L., B.S., M.S.**  
Assistant Professor, Iron County Extension Agent
- Bruce, Avery C., Maj.**  
Assistant Professor of Air Science and Tactics
- Buck, Rulon, B.S.**  
Assistant Professor, Piute County Extension Agent
- Budge, Pearl S., B.S.**  
Instructor in English and Education
- Bullen, Asa, B.S., LL.B.**  
Lecturer in Commercial Law
- Buntine, Hugh A., B.E.E.**  
Associate Professor of Aeronautics  
Head, Aeronautics Department
- Burgoyne, David A., B.S., M.S.**  
Assistant Director, Agricultural Experiment Station
- Burke, Caseel D., B.S., M.S., Ed.D.**  
Associate Professor of Education
- Burningham, Melvin S., B.S.**  
Associate Professor, Weber County Extension Agent
- Burns, Ann, R.N.**  
College Nurse

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\*On leave

**Burtenshaw, G. Ray, B.S.**

Assistant Professor, Juab County Extension Agent

**Burton, Theodore M., A.B., M.A., Ph.D.**

Professor of Chemistry

**Caine, Ann M., B.S.**

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**Caine, George B., B.S., M.A.**

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Head Dairy Industry Department

**Call, Anson B., Jr., B.S., M.S.**

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**Cannon, Melvin C., B.S., M.S., Ph.D.**

Professor of Chemistry

**Cannon, Norman S., B.S., M.S., C.P.A.**

Associate Professor of Accounting and Business Administration

**Carlisle, John C., B.S., M.S., Ed.D.**

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Dean, Summer School

Co-chairman, Art Department

**Carlquist, John H., M.D.**

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Professor, Agricultural Economics and Marketing

Assistant Extension Director

**Carson, J. David Jr., B.S., Ph.D.**

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Associate Professor of Sociology

Acting Director, Division of Social Work

**Carter, Pearl J., B.S., M.S.**

Instructor, Moore Librarian

**Cawley, Helen L., A.B., B.S., M.S.**

Associate Professor of Home Economics Education

Head, Home Economics Education Department

**Child, Rawson D., B.S., M.S.**

Assistant Professor of Tool Engineering

**Christensen, L. Clair**

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Professor of Civil Engineering  
Head, Civil Engineering Department  
Dean, School of Engineering and Technology  
Director, Engineering Experiment Station
- Christiansen, N. Woodruff, B.S., M.A., Ph.D.**  
Professor of Instrumental Music  
Co-chairman Music Department
- Clark, Charles Elmer, B.S.**  
Assistant Professor of Poultry Husbandry  
Assistant Extension Poultryman
- Clark, Clayton, B.S., E.E.**  
Associate Professor of Electrical Engineering
- Clark, Helen I., B.S.**  
Assistant Professor of Physical Education
- Clayton, Ruth V., B.A., M.S.**  
Instructor in Clothing, Textiles and Related Arts
- Coates, Ruth D., B.S.**  
Assistant Professor, Home Demonstration Agent, Piute County
- Cochran, George W., B.S., M.S., Ph.D.**  
Associate Professor of Botany and Plant Pathology
- Cole, Larry S., B.S., M.S., E.E.**  
Professor of Electrical Engineering  
Head, Electrical Engineering Department
- Cook, C. Wayne, B.S., M.S., Ph.D.**  
Associate Professor of Range Management
- \*Cornaby, Floyd V., B.S., M.A.**  
Professor of Art  
Co-Chairman, Art Department
- Coulam, Joseph, B.S.**  
Professor of Woodwork and Building Construction  
Head, Woodwork and Building Construction Department  
Extension Agricultural Engineer
- Cragun, Ezra, B.S., M.D.**  
Special Assistant Professor of Public Health
- Crandall, Bliss H., B.S., M.S.**  
Assistant Director, Agricultural Experiment Station  
Professor of Applied Statistics
- Culmsee, Carlton, B.S., M.A., Ph.D.**  
Professor of Journalism  
Dean, School of Arts and Sciences  
Civilian Coordinator, ROTC
- Daines, Spencer H., B.S., M.S.**  
Associate Professor of Agricultural Engineering  
Head, Agricultural Engineering Department  
Extension Agricultural Engineer

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- Dalby, John Philip, A.B., M.S.**  
Assistant Professor of Music
- Daniel, T. W., B.S., M.S., Ph.D.**  
Professor of Forest Management
- Daniels, Paul Rogers, B.S.**  
Instructor, County Extension Agent, Box Elder County
- Davis, Donald, B.S., Ph.D.**  
Associate Professor of Entomology
- Davis, Lynn H., B.S., M.S.**  
Instructor in Agricultural Economics
- Davis, Russell, B.S., M.S.**  
Assistant Professor of Library Science
- DeHart, William A., B.S., Ph.D.**  
Assistant Professor of Sociology and Extension Sociologist
- Doty, Ina, B.S., M.S.**  
Associate Professor of Business Administration and Accounting
- Downs, Lois, B.S., M.S.**  
Associate Professor of Physical Education
- Drake, Eldon M., B.S., M.S., Ph.D.**  
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- Draper, Carroll I., B.S., M.S., Ph.D.**  
Professor of Poultry Husbandry  
Head, Poultry Department
- Eastmond, Jefferson, B.S., M.S., E.D.**  
Associate Professor of Education
- Edwards, Maxwell D., A.B., A.M.**  
Assistant Professor of English
- Elich, Joe, B.S., M.A.**  
Associate Professor of Mathematics
- Ellsworth, S. George, B.S., M.A., Ph.D.**  
Associate Professor of History
- Embry, Bertis L., B.S., M.S.**  
Associate Professor of Agricultural Engineering
- Erickson, Sylvan, B.S.**  
Controller
- Eskelson, Ross W., B.S.**  
Instructor in Welding
- Esplin, Grant M., B.S.**  
Assistant Professor, Beaver County Extension Agent
- Everton, Joseph K., B.S., M.S.**  
Assistant Professor of Mathematics
- Eyre, Dean, B.S.**  
Purchasing Agent
- Faunce, Everette, B.S.**  
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Associate Professor of Modern Languages
- Foster, Russell V., Jr., Capt.**  
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Professor of Psychology  
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Special Assistant Professor of Public Health  
Director of Laboratories, Utah State Department of Health
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Assistant Professor, Rich County Extension Agent
- Fredrickson, Carmen D., B.S., M.S.**  
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- Frischknecht, Carl, B.S., M.S., Ph.D.**  
Professor of Agriculture  
Director of Extension Service
- Fuhriman, Dean K., B.S., M.S., Ph.D.**  
Associate Professor of Irrigation and Drainage Engineering
- Fuller, Pauline, B.S., M.S.**  
Assistant Professor of Physical Education
- Funk, Charles Dennis, B.S.**  
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- Garden, Henry J., Capt.**  
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- Gardner, Bruce, B.S., M.S., Ph.D.**  
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Head, Child Development and Parent Education Department
- Gardner, Eldon J., B.S., M.S., Ph.D.**  
Professor of Zoology
- Gardner, Rhea H., B.S., M.S.**  
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Extension Housing and Home Management Specialist
- Gardner, V. D., B.S., M.B.A.**  
Professor of Accounting and Business  
Head, Accounting and Business Administration Department
- Gates, L. K., B.S., M.D.**  
Special Assistant Professor of Public Health
- Gerber, Robert K., B.S., M.S.**  
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Associate Professor of Clothing, Textiles and Related Arts
- Gordon, Vaughn W., B.S., M.S.**  
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Extension Recreation Specialist
- Greaves, Ethelyn O., B.S., M.S., Ph.D.**  
Professor of Foods and Nutrition  
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Dean, School of Home Economics
- Greaves, Melvin J., B.S., M.C.E.**  
Professor of Civil Engineering
- Greenwood, Delbert A., B.S., M.S., Ph.D.**  
Professor of Biochemistry
- Grimshaw, Paul R., B.S., M.S.**  
Assistant Professor  
County Agent, Grand County
- Gunn, Richard C., Sgt.**  
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- Gunnell, Merrill H., B.S., M.S.**  
Assistant Professor of Zoology
- Guyman, E. Lee, B.S., M.S.**  
Associate Professor, Sevier County Extension Agent
- Hailes, Charles W., B.S., M.S.**  
Assistant Professor of Industrial Education
- Hammond, Datus M., B.S., M.A., Ph.D.**  
Professor of Zoology  
Head of Zoology Department
- Hansen, Bessie, B.S.**  
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- Hansen, Blair I., B.S., M.S.**  
Assistant Professor of English
- Hansen, Burrell F., B.S., M.A., Ph.D.**  
Assistant Professor of Speech
- \*Hansen, Vaughn E., B.S., M.S., Ph.D.**  
Associate Research Professor of Irrigation and Drainage Engineering
- Hardy, Clyde T., B.S., Ph.D.**  
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- Hardy, Leonard J., M/Sgt.**  
Instructor in Air Science and Tactics

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\*On leave

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- Harris, Grant**, B.S., M.S.  
Assistant Professor of Range Management
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Research Instructor in Animal Husbandry
- Harris, Leone**, B.S., B.L.S.  
Assistant Professor, Head of Serials in Library
- Harris, Lorin E.**, B.S., M.S., Ph.D.  
Professor of Animal Husbandry  
Chairman, Institute of Nutrition
- Harris, Ruth Malin**, B.S.  
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- Harrison, Gladys L.**, A.B.  
Assistant Professor  
Bulletin Editor, Agricultural Experiment Station
- Hart, Philip J.**, B.S., Ph.D.  
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Assistant Professor, Carbon County Extension Agent
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Instructor in Air Science and Tactics
- Hayward, J. Clair**, B.S., M.D.  
Special Assistant Professor of Public Health
- Hayward, Ira N.**, B.S., Ph.M.  
Professor of English
- Heaton, Israel C.**, B.S., M.S.  
Associate Professor of Physical Education
- Hendricks, King**, B.S., M.A., Ph.D.  
Professor of English  
Director of Libraries
- Henderson, George R.**, B.S., M.A.  
Professor, Extension Animal Husbandman
- Hensley, Gaston M.**, Lt. Col.  
Assistant Professor of Air Science and Tactics
- Hess, Alvin**, B.S., M.S.  
Collaborator in Teacher Training
- Hoard, Frank E. Jr.**, M/Sgt.  
Instructor in Air Science and Tactics
- Holman, Valera Guyman**, B.S.  
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Extension Dairyman

**Hunsaker, Neville C., B.A., M.A., Ph.D.**

Professor of Mathematics

**Hurst, Clyde,**

Instructor in Automotive Technology

**Hurst, Rex L., B.S., M.S., Ph.D.**

Supervisor Statistical Laboratory

Assistant Professor of Statistics

**Israelsen, Vernon L., B.S., M.A., Ph.D.**

Professor of Agricultural Economics and Marketing

**Jacobsen, Ernest A., A.B., M.A., Ed.D.**

Professor of Education

Dean, School of Education

**James, Garth A., B.S., M.S.**

Instructor in Bacteriology and Public Health

**James, Lynn F., B.S.**

Instructor, Assistant County Extension Agent, Utah County

**James, William E., M/Sgt.**

Instructor in Air Science and Tactics

**Jarrett, Von H., B.S.**

Instructor in Agricultural Engineering

**Jensen, J. O., B.S.**

Assistant Professor of Physics

**Jensen, Louis A., B.S.**

Assistant Professor, Extension Agronomist

**Jensen, Myrtle R., B.S.**

Instructor in Elementary Training School

**Jensen, Naomi, B.S.**

Assistant Professor, Home Demonstration Agent, Summit County

- Johnson, Leonard M., Lt. Col.**  
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Director, Quartermaster Corps
- Johnson, Stanford L., B.S., M.S.**  
Assistant Professor in Accounting and Business Administration
- Johnson, Theta, B.S., M.S.**  
Assistant Professor and Extension Clothing Specialist
- Jones, Clara Ramsay, B.S.**  
Assistant Professor, Home Demonstration Agent, Washington County
- Jones, Lewis W., B.S., M.S., Ph.D.**  
Associate Professor of Bacteriology
- Jones, Norman F., M/Sgt.**  
Instructor in Air Science and Tactics
- \*Jones, William L., B.S., M.S.**  
Assistant Professor of Electrical Engineering
- Kearsley, Amy R., B.S., M.A.**  
Associate Professor  
Assistant Supervisor of Youth Programs
- Keck, Wendell M., B.A., M.A., Ph.D.**  
Professor of English
- Keetch, Russell R., B.S., M.S.**  
Associate Professor  
Extension Sheep and Wool Specialist
- Kelker, George Hills, A.B., B.S.F., M.S.F., D.Sc.**  
Professor of Wildlife Management
- Kemp, Anton B.**  
Instructor in Welding  
Head, Welding Department
- Kennington, Sigrid S., B.S., M.S.**  
Instructor in Chemistry
- Kepner, Harold R., A.B., S.B., S.M.**  
Professor of Civil Engineering
- Kilburn, A. Golden, B.S.**  
Associate Professor  
Extension Soil Conservationist
- Kirk, Odeal C., B.S.**  
Superintendent, Howell Field Station for Horticultural Research
- Klein, Louis, Jr.**  
Instructor in Aeronautics
- Knowlton, George F., B.S., M.A., Ph.D.**  
Professor of Entomology  
Extension Entomologist
- Land, Robert A., Capt.**  
Assistant Professor of Military Science and Tactics
- Larsen, Jessie, B.S., M.F.A.**  
Associate Professor of Art

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\*On leave.



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Associate Professor of Dairying
- Lee, Ivan E., B.S.**  
Instructor in Automotive Technology
- Lemon, Bessie K., B.S.**  
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- Lewis, Dorothy B., B.S., M.S.**  
Assistant Professor in Child Development and Parent Education
- Lewis, Evelyn Hodges, B.S., A.M.**  
Assistant Professor of Sociology
- Linford, Gene H., B.S., M.S.**  
Assistant Professor of Zoology
- Litz, Owen E., Capt.**  
Assistant Professor of Military Science and Tactics
- Long, Wesley T., 1st Lt.**  
Assistant Professor of Military Science and Tactics
- Logan, Ida M., B.S.**  
Instructor, Reference Librarian
- Loll, Leo M., Jr., A.B., M.B.A.**  
Assistant Professor of Economics
- Loveless, Austin G., B.S., M.S.**  
Head, Engineering Drawing Department  
Associate Professor of Engineering Drawing
- Low, J. B., B.S., M.S., Ph.D.**  
Special Professor of Wildlife Management  
Leader, Utah Cooperative Wildlife Research Unit
- \*Ludlow, Daniel H., B.S.**  
Instructor in Library Science  
In charge of Visual Aids Department
- Lujan, Max, Sgt.**  
Instructor in Military Science
- Lund, Kirk, B.S.**  
Research Assistant in Poultry Husbandry
- Lundstrom, Helen, B.S.**  
Instructor in Business Administration and Secretarial Science
- MacKusick, Arthur L., Lt. Col.**  
Assistant Professor of Military Science and Tactics  
Director, Ordnance
- Madsen, Milton A., B.S., M.S.**  
Associate Professor of Animal Husbandry
- Maeser, Sherwin, A.B., Ph.D.**  
Professor of Chemistry  
Head of Chemistry Department
- Martin, Maude, B.S.**  
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- Mattes, George J., Capt.**  
Assistant Professor of Air Science and Tactics
- Matthews, Doyle J., B.S., M.S.**  
Assistant Professor of Animal Husbandry
- Maughan, Ralph, B.S., M.S.**  
Assistant Professor of Physical Education  
Freshman Coach
- McAllister, DeVere R., B.S., M.S., Ph.D.**  
Associate Professor of Agronomy
- McBride, C. D., B.S., M.S.**  
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- Miller, Elna, B.S., M.S.**  
Professor, Extension Nutritionist
- Milligan, Cleve H., B.S., M.S.**  
Professor of Irrigation and Drainage Engineering  
Head, Irrigation and Drainage Engineering Department
- Miner, Merthyr L., B.S., D.V.M.**  
Professor of Veterinary Science
- Moody, Howard A., Col.**  
Professor of Air Science and Tactics
- Moore, James Reed, B.S.**  
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- Moore, Oleta P., A.B., M.S.**  
Instructor in Clothing, Textiles and Related Arts
- Moore, Raymond R., B.S., M.S.F.**  
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- Morgan, Floyd T., B.S., M.A.**  
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Extension Dairy Manufacturing Specialist  
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Professor of Landscape Architecture and Planning  
Head, Landscape Architecture and Planning Department
- Morrison, Earnest M., B.S., M.S.**  
Associate Professor of Agricultural Economics and Marketing
- Mortensen, M. Lynn, B.S., M.S.**  
Assistant Professor of English
- Mortimer, William E., B.S., M.S.**  
Professor of Industrial Education  
Head, Industrial Education Department
- Moser, Faye, B.S., M.S.**  
Instructor in Chemistry
- Mulliner, Harriet Pearson, B.S.**  
Instructor, Home Demonstration Agent, Utah County
- Munk, Lorene, B.S., M.S.**  
Instructor, Assistant Documents Librarian
- Murdock, Robert Scott, B.S.**  
Assistant Professor, Duchesne County Extension Agent
- Murray, Evan B., B.S., M.S.**  
Professor of Economics  
Head, Economics Department
- Myers, Chester J., B.S., M.A., Ph.D.**  
Professor of Speech  
Head, Speech and Drama Department
- Nelson, Dale O., B.S., M.S.**  
Assistant Professor of Physical Education
- Nelson, George**  
Trainer, Wrestling Coach  
Instructor in Physical Education
- \*Nelson, Jesse G., A.B.**  
Assistant Professor of Languages
- Nelson, Mary, B.A., M.S.**  
Associate Professor of Mathematics
- Neuberger, L. Mark, B.S., M.S.**  
Executive Assistant to the President  
Professor of Accounting and Business Administration
- Newman, Parley, B.S., M.S.**  
Assistant Professor of Speech Correction
- Nichols, DeLore, B.S.**  
Professor, Davis County Extension Agent
- Nichols, Fern S., A.B.**  
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- Nielsen, Constance, B.S.**  
Instructor in Elementary Training School

- Nielsen, Harold M., B.S., M.S.  
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- Nielsen, Marion L., B.S., M.A., Ph.D.  
Professor of Modern Languages
- Nielsen, Sarah S., B.S.  
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Assistant Professor of Agronomy
- Noble, Lee Grande, B.S., M.S., Ed.D.  
Professor of Education  
Coordinator of Extension Class Work, Home Study, Evening School
- Norton, Robert A., B.S., M.S., Ph.D.  
Assistant Professor of Horticulture
- Nyman, Ross A., B.S.  
Instructor in Engineering Drawing
- Oakes, Keith R., B.S., M.S.  
Associate Professor of Education
- Oberly, Gene, B.S., M.S.  
Assistant Professor, Extension Horticulturist
- Oleson, Lamar, B.S.  
Instructor in Elementary Training School
- Olsen, Floris, B.S., M.S.  
Assistant Professor of Accounting and Business Administration
- Packman, Samuel L., M/Sgt.,  
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- Page, Edna, B.S., M.A., Ph.D.  
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- Pahtz, George  
Instructor in Instrumental Music
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Assistant Professor, Home Demonstration Agent, Sanpete County
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Instructor in Elementary Training School
- Parrish, Joseph F., B.S.  
Associate Professor, Salt Lake County Extension Agent
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Professor of Military Science and Tactics
- Perkins, Charles J., T/Sgt.  
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- Peterson, Howard B., B.A., M.A., Ph.D.**  
Professor of Agronomy
- Pittman, Don W., B.S., M.S.**  
Professor of Agronomy
- Plummer, Harry W., Maj.**  
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Professor of Vegetable Crops and Horticulture  
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- Poznanski, Mischa, B.S., M.S.**  
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- Preator, Frederick, B.S., M.Ed.**  
Professor of Tool Engineering  
Head, Tool Engineering Department
- Publicover, Robert G., CWO**  
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- Pugmire, Dorothy Jean, B.S., A.M.**  
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- Reichert, Mary Lois, B.S.**  
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- Reynolds, H. Reuben, Graduate, Chicago Art Institute**  
Professor of Art
- Rice, Moyle Q., B.S., M.A.**  
Associate Professor of English
- Rich, Lyman H., B.S., M.S.**  
Professor, Extension Dairyman
- Richardson, Charles A., SFC**  
Instructor in Military Science
- Richardson, Stanley S., B.S., M.S.**  
Professor and Chairman of Vocational Education  
Head, Agricultural Education Department
- Rickenbach, Rodney G., B.S.**  
Associate Professor, Millard County Extension Agent
- Ricks, Joel E., A.B., A.M., Ph.D.**  
Professor of History  
Head, History Department
- Riethmann, Otto**  
Instructor in Floriculture
- Robinson, Rex E., B.S., M.A., Ph.D.**  
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**Rogers, Jack A., Lt. Col.**  
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Director, Artillery

**Rogers, L. H. S., B.S.**  
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Chairman, Division of Education

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**McAfee, Ruth**  
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Veterans' Coordinator  
Dean of Students

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Cox, R. Reid—Superintendent of Buildings and Maintenance

Rigby, Eldro—Manager of Campus Farm

Roberts, Joseph—Watchman and Caretaker

Robb, Ward—Registrar

Farnsworth, Norma—Cashier

**Accredited Instructors Cooperating With C. S. U.**

Larson, Virginia—Special Instructor in Music

Jones, Bernella—Special Instructor in Music

Johnson, Mrs. Blaine—Special Instructor in Music

Thorley, Max J.—Special Instructor in Music

Larson, G. O.—Director of L. D. S. Institute of Religion

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Whetten, Lester B., B.S., M.S.  
Director

Thompson, Lee R., B.S.  
Treasurer

Stevenson, Elna, A.S.  
Registrar

Killian, George W., B.S.  
Dean of Men

Gassman, Alta, B.S.  
Dean of Women

Nuttall, Nada P.  
Manager of Bookstore

Jorgensen, Delphia P.  
Manager of Cafeteria

Jensen, J. Edwin  
Supervisor, Buildings and Grounds

Bailey, Fred  
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**FACULTY**

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- Dean, H. A., B.S., M.S.**  
Professor of Music
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Chairman, Division of Home Economics
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Instructor and Librarian
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Associate Professor of Modern Languages and English
- Groutage, Harrison**  
Instructor in Art and English
- Hanson, Afton, B.S., M.S.**  
Instructor in Biology  
Chairman, Division of Biology
- Killian, George W., B.S.**  
Assistant Professor of Education  
Chairman, Division of Education
- Mangelson, Farrin L., B.S., M.S.**  
Assistant Professor of Chemistry
- Marsden, Ralph D., B.S.**  
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- McQuarrie, Harlow B., B.S., M.S., M.D.**  
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Supervisor of College Farm
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**Van Epps, Gordon, B.S., M.S.**

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**Whetten, Lester B., A.B., M.A.**

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**Willardson, George, B.S., M.S.**

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**Williams, James J., B.S.**Associate Professor of Physical Education  
Chairman of Athletics**Special Instructors****Fitzgerald, H. Alva**

Director of L. D. S. Institute of Religion

**Groutage, Mrs. Iva Lou**

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**Jensen, Lavar**

Instructor in Piano

**Judkins, L. N.**

Instructor in L. D. S. Seminary

**Killian, Mrs. Ruth**

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**Peterson, Mrs. P. C.**

Instructor in Piano

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## GENERAL INFORMATION

### LOCATION

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

### POLICY

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

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

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

The Constitution of Utah establishes Utah State Agricultural College and the University of Utah as the two State institutions of higher learning. These institutions are independent in government, but each is part of the public school system. Each, under the Constitution and the Statutes of Utah and in harmony with the ruling of its governing board, offers undergraduate and graduate studies leading to 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 that created, stated the purposes, and set forth the fields of activity of these divisions. The Morrill Act (1862) provided for establishment of Land-Grant Colleges by the grant of Federal lands to provide a material basis for these institutions. Utah received 200,000 acres. The Second Morrill Act (1890) carried an annual appropriation to each college, the sum to be spent for instruction in designated subjects. Additional Federal legislation that increased financial aid to the institution includes the Hatch Act (1887), for experimental purposes; the Smith-Lever Act (1914), to aid in beginning and developing extension work; more recently, the Bankhead-Jones Act, which supports all three divisions in some degree. All these acts constituted the basis of Federal participation in the extension of college education and rural agricultural development to the masses of American people. Participation by the Territory of Utah in this Federal program came through passage of an act "to establish an Agricultural College and an Agricultural Experiment Station," introduced into the legislature by Representative Anthon H. Lund on February 27, 1888, and signed by Governor Caleb West, March 8, 1888.

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

The Federal Land Grant Act of 1862 explained that the colleges were, "without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to Agriculture and the Mechanic

arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." The Territorial Act of 1888 confirmed these purposes and defined the fields of instruction offered by the college to include "the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy, physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and mechanical arts to the practical agriculture in the field."

Since its beginning in 1890 eight presidents have guided the destinies of the college. Following President J. W. Sanborn came President J. H. Paul in 1894, President J. M. Tanner in 1896, President W. J. Kerr in 1900, President John A. Widtsoe in 1907, President E. G. Peterson in 1916, Dr. Franklin S. Harris in 1945, and Dr. Louis Linden Madsen in 1950. Dr. Henry Aldous Dixon was inaugurated as the ninth president on March 8, 1954. From one building in 1890, the number of buildings has reached thirty-eight, plus many temporary buildings of various sizes.

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

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

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

The College of Southern Utah is directed by Dr. Daryl Chase, formerly Dean of Students and Director of Student Personnel at Logan.

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

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

Lester B. Whetten has been director of Snow College since March 1953.

## PHYSICAL PLANT

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

## BUILDINGS AND FACILITIES

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

Main building, a three-story brick structure, is the prime landmark in the history of the institution. Its halls and classrooms have resounded to classes coming and going for more than 60 years. In it are located the administrative and the business offices of the College and Experiment Station, the departments of Agricul-



tural Economics, Art, Education, Geology, Landscape Architecture, Mathematics, Modern Languages, Music, Psychology, Sociology, Speech, Zoology, and the Schools of Arts and Sciences and Commerce. The Main Auditorium in the East wing of the building has been completely remodeled. New theatre seats of the best type obtainable have been installed, along with a completely new sound system. Provisions have been made for proper ventilation. Thus it affords excellent facilities for student gatherings, assemblies, and the presentation of College plays. A studio theatre, used by the Speech department, and the broadcasting studios of radio station KVSC are on the second floor, north wing.

The combination Home Economics and Commons building located at the southeast corner of the quadrangle provides facilities for social and cultural activities of both faculty and students. It also houses the Home Economics Library, with nutrition research laboratory in the basement. Additional Home Economic research laboratories, kitchen, and nursery school are planned for the area formerly occupied by the Cafeteria. Educationally, this structure functions as the quarters of the School of Home Economics and the department of Physiology. These departments both have modern, well-lighted classrooms and laboratories, all equipped with standard, scientific equipment.

The Thomas Smart gymnasium is the center of much athletic activity. It houses offices of the department of Physical Education for men and women, indoor and intramural sports, and a swimming pool.

The Field House, a spacious steel and brick structure, 356 feet long by 137 feet wide, completed in 1939, is used for many activities. It is the center of College competitive athletics, and is used for other large college and public gatherings, including commencement activities, numerous concerts, and military functions. It is equipped with an excellent basketball playing floor and a seating capacity of 6,500. For indoor tennis, track, softball and football practice, the building is ideal.

A companion building to the Field House is the Military Science building. This brick-concrete structure is provided with excellent offices, classrooms, rifle ranges, gun and equipment supply rooms. The gun shed now houses four modern classrooms, security room for arms and equipment, and additional supply rooms. The combination of this building and the Field House makes possible military training the year around.

The Extension Service building is now the headquarters of the statewide Utah Cooperative Extension Service, maintained by the College and Federal Government jointly.

Widtsoe Hall is wholly occupied by the departments of Chemistry, Physics and Experiment Station laboratories. Chemical and physical laboratories are furnished with ample facilities and scientific equipment for student training and research.

The Animal Industry building is occupied by the departments of Animal Husbandry, Poultry Husbandry, Dairy Industry, Horticulture. Besides laboratory and classroom facilities for the study and teaching of dairy manufacturing, animal and poultry nutrition, breeding and wool technology, this building houses a modern cheese, butter, and ice cream manufacturing plant, and a dairy bar, used for practical training in dairy products manufacturing.

The Plant Industry building houses the departments of Agronomy, Bacteriology and Public Health, Botany and Plant Pathology, and the large Intermountain Herbarium.

The Engineering building is headquarters for the School of Engineering and Technology. In this building, all the college courses in Civil Engineering including Surveying, Mechanical Drawing, Hydraulics, Irrigation and Drainage, Municipal and Agricultural Engineering, are taught. This building houses the Hydraulics, Irrigation, Soil Mechanics, Agricultural Engineering and drafting and design laboratories.

The Mechanic Arts building houses shops of the School of Engineering and Technology, laboratories for work in the technology of Forging, Industrial Education, Radio, Machine Practice, Electronics, Sheet metal, Welding, Woodwork and Building Construction. Much new equipment has been added to the shops during the past five years.

The Library building, academic and cultural center of the College, is located on the east side of the quadrangle. The departments of English and History use the top floor for their classes because of convenient access to library stacks. It



houses the Hatch Memorial library. Much of the furnishings of this Library are of old English origin which came directly from England with the original coat of arms. The material deposited in this Library is divided in four sections as follows: Hatch, Utahnalia, Art Books, and Rare Books. This makes a very fine contribution to our library offering.

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

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

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

A new Agricultural Science building is being erected on the campus to house the Administrative offices of the Experiment Station and Extension Service. It will also have classrooms and laboratories equipped with the finest of equipment. It is anticipated it will be ready for occupancy for the Winter Quarter of the school year 1954-55.

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

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

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

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

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

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

## HOUSING

The College operates several housing units for both single and married students. Lund Hall, on the campus, is a fire-proof, air-conditioned dormitory for 200 women students. All items are furnished except towels. Meals are provided at the nearby college cafeteria. The Co-operative House, a large residence on the campus, accommodates 11 women students. They pay a flat rate for rent and utilities, and share other living expenses and housework. College apartments are also available for single women.

Kerr Hall, on West Center Street, has facilities for 45 men. A local bus line gives direct service to the campus. All items except towels are furnished. Two meals a day are provided. For single men, some college apartments and quonset huts are also available.

Three types of family living units are available. Comfortable heated apartments in the college apt. buildings are especially desirable. They consist of a kitchen-dining room, bedroom, closets, and bathroom with shower. These apartments may be rented either furnished or unfurnished. The quonset apartments, located two blocks east of the campus, have similar facilities. Students owning trailers may rent space very reasonably in a modern trailer park which is being built. It will be available for the school year 1954-55.

Private housing is available in Logan with board and room, apartments, "batching" quarters, and other arrangements. The college housing office lists all such facilities currently available.

Requests for reservations or for further information should be addressed to: College Housing, Director, Utah State Agricultural College, Logan, Utah.

## LABORATORIES

The numerous College laboratories are provided with satisfactory working conditions. The equipment is generally complete, and extensive experimental research is carried on by both faculty and advanced students. Recent important acquisitions include an electron microscope, a spectograph, and an ultracentrifuge.

## THE LIBRARIES

The College Library system consists of the Main Library and ten branches: Home Economics, Engineering, Commerce, Forestry, Hatch Memorial Library, Claypool Map, Moore Children's Library (temporarily housed with the Home Economics), Whittier, Browsing, and Audio-Visual Aids Library. All are centrally administered and centrally cataloged; that is, all the material in all the branch libraries is recorded in the master catalog of the main library; thus all material, regardless of form, is readily accessible. Each branch is located in the same building as the school it serves.

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

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

Patrons interested in music find the Music Library, established by a Carnegie grant and maintained in the Browsing Library in the Union Building, a worthwhile feature. The collection of some 4,500 records has music for every taste, classic and popular. Speakers and headphone sets are maintained for library users.

The new picture collection is a special feature of library service. It has more than 12,000 pictures of plant and animal life, famous persons, pictorial histories, famous paintings, and many other interesting pictures, many of which are mounted and laminated for use in display and teaching.

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

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

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

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

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

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

## HERBARIUM

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

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

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

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

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

## STUDENT ORGANIZATIONS

### Activities and Traditions of the Student Body Organization

The Associated Student organization of Utah State Agricultural College includes all students of the Institution. Its prime objectives are to foster a spirit of college loyalty, and to give the students experience in managing student affairs. Students are encouraged to participate in the activities available to them on the campus. The new Student Union building, one of the finest in America, is the center of most student affairs. The Associated Students provide each member with athletic, theatrical, musical, cultural, and social recreation at low cost. Students may participate in the following activities:

1. Intercollegiate athletics.
2. Intramurals. This program includes all seasonal sports, for which awards are given.
3. Musicals. Performances are given by band, orchestra, choral groups, and music clubs. These organizations present several concerts during the year, and each group tours some part of the surrounding area.
4. Theatricals. Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.
5. Opera. Each year the Music Department produces an opera. Such operas as "Rigoletto," "Faust," "Aida," and "Il Trovatore," have been presented.
6. Debating and Public Speaking. The College is a member of the Rocky Mountain Forensic League, and each fall meets schools of this group in discussion. Participation in debate tournaments in the Intermountain and Pacific Coast Region provides opportunity for experience in tournament debating. Utah State is noted for its Mid-Winter Speech Meet.
7. Student Publications. Students publish a weekly paper, "Student Life";

a yearbook, "The Buzzer"; and a quarterly magazine, "Scribble"; "Blue Book" and Student Directory, which are distributed to all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's "Juniper."

8. USAC Lyceum and Cache Valley Civic Music. The Lyceum-Civic Music series presents numerous national and international artists.

9. Dances and Entertainments. In addition to the above, the Student Body Organizations furnish extensive entertainment in the form of dancing, parties, and athletic events.

10. Assemblies. These are planned and produced by students to provide entertaining, spiritual and cultural programs.

11. Committees. Students are members of virtually every college committee. This includes not only Student Body committees, but also committees set up by the administration, such as Curriculum-building, Resident Hall Planning, Activities, etc.

More than 100 student organizations operate on campus. These include honorary educational, cultural, and professional societies, interest clubs, twelve national Greek-letter social fraternities and sororities, and religious social groups such as Westminster Forum, Canterbury and Newman Clubs, and eleven chapters of Lambda Delta Sigma.

### Foreign Students

Since 1945 many students from foreign lands have been helped with their special needs in English, speech and academic activities. The Cosmopolitan Club for both foreign and American students is active. International Week is a major student body function to foster better human relationships.

The following countries are usually represented at USAC: Belgium, Bolivia, Canada, China, France, Guatemala, Hawaii, India, Iran, Iraq, Israel, Korea, Trans-Jordan, Lebanon, Mexico, Nigeria, Norway, Pakistan, Palestine, Philippines, Poland, Siam, Switzerland, Syria, Thailand, and Turkey.

## USAC ALUMNI ASSOCIATION

**R. O. Porter, President**

**LeRoy A. Blaser, Executive Secretary**

The Utah State Agricultural College Alumni Association now numbers more than 12,000 members. These alumni have achieved outstanding prominence in every walk of life. Many Aggie alumni have rendered military service and an especially large number of them held, or are now holding, high commissions in the various branches of the armed forces.

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

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

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

a joint membership, both payable in \$5.00 installments.

**Government.** The governing power of the Association is vested in the Alumni Council, composed of 15 elected members and ex-officio members. The current president of the Senior class and the president of the Associated Student organization are both ex-officio members of the Council. The Alumni Executive Secretary is the official representative of the Association on campus. The President of the Alumni Association is a member of the Utah State Agricultural College Board of Trustees, as provided by Chapter 5, Article 75-5-0, School Laws, State of Utah.

**Function.** The Alumni Association is the medium through which the former students of Utah State are kept in contact and are served after leaving the campus. Efforts are made to maintain a complete record of every alumnus throughout life, and his accomplishments and progress are recorded. Members receive the Utah State ALUMNUS, a magazine published nine months a year, full of Aggie news and reports on the College. The Association maintains Alumni Chapters in all major areas where Aggies are located. Through this local organization, Aggies are kept in contact with each other, and they meet and participate in business and social activities. They likewise assist the College with special projects in their areas. The Association endeavors to keep in contact with all Aggies and assists them in reference and contact problems. Membership in the Association is the best way for an Aggie to demonstrate his interest and support of the College and its program after leaving the campus.

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

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

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

**Cluff Snow, President**

**Glen Worthington, Secretary**

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

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

## **PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE**

The Professional Relations and Faculty Welfare committee, authorized by the Board of Trustees and the Administration and elected by the Faculty, represents the Faculty on matters pertaining to professional relationships and welfare.

## **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 College of Southern Utah at Cedar City; (7) the Snow College branch at Ephraim. The academic regulations apply to all instructional work at regular session, summer session, correspondence and extension study.



### Admission

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

Entrance with college standing is based upon (a) graduation from an accredited high school or (b) if applicant is over 18 years of age, and upon presentation of fifteen approved high school units of work or (c) by examination of those students 18 years of age or older who have had other training.

Students who have not been graduated from high school and who are presenting fifteen approved units for entrance may include one unit of credit for military science or one unit of physical education, but not more than one unit in combination.

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

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

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

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

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

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

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

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

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

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

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

Students who expect to become candidates for any degree or diploma from any of the schools of the College must include among the units presented those preparatory courses specified as prerequisite to beginning college courses in the various fields. Such students are urged to give serious thought to the selection of a major field of interest. Each student in cooperation with his parents, high school principal or other high school advisor should plan the high school program of 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 which do have, list them in their school and departmental section in this College catalog. This information should be used in planning the high school course.

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

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

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

The College has made special provision for entrance, vocational 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.

### Registration and Credits

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

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

**Registration Dates:** For the Fall Quarter students will register on Thursday, Friday and Saturday, September 23, 24 and 25. Classes will begin Monday, September 27.

For the Winter Quarter, all students will register on Monday, January 3. Classes will begin Tuesday, January 4.

Registration for the Spring Quarter will be on Monday, March 21. Classes will begin Tuesday, March 22.

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

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

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



### Academic Regulations with Respect to Registration

**Registration Defined:** Registration is not complete until the student has presented his fee card at the cashier's window, office of the Secretary and Treasurer, and has paid his fees and filed his registration cards with the Registrar's office.

**Penalties for Late Registration:** **Late Registration fee.** A fee of one dollar per day will be charged those who register late with a maximum fee of five dollars. The late fee will be assessed (a) for late registration resulting from late filing of application and credentials for admission or for readmission; or (b) for late registration resulting from failure to begin registration on scheduled registration dates; or (c) for delay in completion of registration, including payment of fees and filing of registration cards with the Registrar's office, beyond the first week of each quarter.

**Reduction in load.** The amount of work for which any student will be allowed to register will be reduced by one and one-half credits for each week, or fraction thereof, that he is late in registering.

**Final deadlines:** No student will receive credit for residence work unless he is officially registered for the specific courses involved. Registration must be completed not later than two weeks before the end of the quarter or session at which time final class lists will be prepared. No registration, either in the form of adding of classes to original registration, or original registration will be accepted for the quarter or session after that date.

**Changes in Registration:** The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's office, is considered to be the student's official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official change-of-registration form is filed with the Registrar's office before the deadline, "F" grades are recorded in case of failure to obtain passing grades in any course for which the student has registered, regardless of the reason for the failure.

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

After the beginning of the fourth week of any academic quarter, withdrawal from a class is not permitted except when circumstances beyond the control of the student exist. The dean of the school in which the student is registered considers each case on its merits. The signature of approval from the dean, in addition to the signatures of the instructor and the adviser, must appear on the change-of-registration form before it is accepted at the Registrar's office.

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

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

**Additions to Registration:** An addition to the original registration can be effected on the official change-of-registration form. The approval of the teacher concerned and the student's adviser must be obtained and indicated by signatures on the change-of-registration form before the card will be accepted in the Registrar's office. After the beginning of the fourth week of any academic quarter any additions to the original registration must be approved by the dean of the school in which the student is registered as well as by the instructor of the class and the student's adviser.

**Change-of-Registration Fee:** No charge is made if change cards are filed within the first week of each quarter. After the first week a fee of fifty cents is charged for each change card.

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

**Importance of Submitting Forms to the Registrar's Office:** The special change-of-registration form, properly executed, must be filed at the Registrar's office before any change becomes effective. **Withdrawal from a class without adhering to the regulations specified above makes it mandatory upon the instructor and the Registrar to record an "F" grade!** Attendance at classes without proper approval and without official registration as defined above, and before the deadline as specified above, will result in forfeiture of any credit for such attendance.

**Responsibility of Instructors:** Instructors are charged with the responsibility of denying students the privilege of attending classes if they have not complied with regulations herein prescribed for admission to classes.

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

**Maximum Registration** without approval for excess credit is set at 17 credits exclusive of one credit in basic Military Science or basic Physical Education. Only the dean of the school in which the student is registering has authority to approve registration in excess of this maximum. A student is not allowed to register for less credit than that listed for a course in order to bring the total registration within the maximum limit as herein defined. The registration is construed to include any extension, correspondence, institute, or other work carried by the student for credit, or for removal of high school deficiencies during the period of the school year.

**Minimum Registration.** The minimum registration for a full-time student load is usually considered to be twelve credit hours. To be eligible for student body offices a student is required to be registered for twelve quarter hours or more. Veterans are required to be registered for fourteen quarter hours or more to qualify for full subsistence. Students deferred by the Selective Service system under 1 SC status are required to maintain an average of 15 credits per quarter.

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

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

**Credit by Examination:** In special cases, students may be permitted to obtain college credit by passing examinations in subjects not taken in course. Credit for a subject taken in course for which a grade other than passing has been received cannot be acquired by means of special examination. This privilege does not permit the combination of "visiting" or "auditing" a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure information and

training gained from practical experience that may be considered the equivalent of the experience and training received by students in an organized course given in the college.

A maximum of 18 quarter hours' credit can be acquired by special examination. None of the last 30 credits presented for a B.S. degree may be obtained in this manner. Unless the examination is taken prior to the close of the second week of any quarter for which a student enrolls, the credits gained will be included as part of the student's load for the quarter.

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

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

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

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

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

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

## LOWER DIVISION

The Lower Division comprises the work of the Freshman and Sophomore years. The main purposes of this division are to provide a broad and integrated background in the principal fields of human knowledge, and to prepare students for the major work upon which they will concentrate in the Upper Division.

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

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

Students should satisfy the following requirements, in order to complete the work of the Lower Division:

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

### A. English Composition.

1. A placement examination in English is required of all freshmen.
2. 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.

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

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

2. **Exact Science.**

Chemistry—any course of Lower Division grade.

Geology—1 or 3, 4, 5; Geography 41.

Mathematics—any course of Lower Division grade.

Physics—any course of Lower Division grade.

(Physical Science 31 and 32 are recommended. These courses are built around principals central to all the physical sciences.)

3. **Language and Arts.**

Art 1, 2, 3, 4, 22, 26, 32, 33, 36.

English—any literature course of Lower Division grade.

Landscape Architecture 3.

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

Music 1, 80, 81, 90.

Speech—any course of Lower Division grade.

4. **Social Science.**

Agricultural Economics 53.

Economics 51, 52.

History—any course of Lower Division grade.

Psychology 53.

Political Science 1, 10, 70.

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 or Air Science.

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

**UPPER DIVISION**

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



Physical Education or Military Science required at the Institution from which they are transferring, may be registered in the Upper Division.

The completion of the group requirements in any accredited collegiate institution will substitute for the completion of the group requirements at this institution, as prescribed in the section "Lower Division" above. This does not apply to students who have been pursuing prescribed courses which do not include the group requirements. Students who change from a prescribed course to a major under the group elective system must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue on in a prescribed course will be held for the completion of the Lower Division courses as prescribed at this institution, except as equivalent courses may be accepted as substitutes for our own courses.

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

The Major Department has the authority to prescribe not less than 30, and not more than 50 credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). The Major Department and the Dean shall also prescribe such other related courses as may be considered desirable, provided always that the student's free electives may not be reduced below 36 credits.

Special consideration is granted students who pursue prescribed Pre-medical, Pre-dental, Pre-veterinary, Pre-osteopathy, Pre-legal, and Child Development programs for three years at this College. If they pursue further prescribed work in their field for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this College. They need not comply with general major-minor requirements as previously outlined.

**Minor Subjects:** The student is permitted to choose his own minor. The minor consists of 18 credits either in one department or in two departments closely related in subject matter, provided that minor in more than one department must have the approval of the Dean and the Major Professor.

Courses used to satisfy the English composition, the basic groups, military science or physical education, and 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 study in certain departments; the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy; and gives work to fulfill the requirements for all professional certificates issued by the State Board of Public Instruction.

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

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

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

## Terminal Certificate

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

In the Schools of Agriculture and Home Economics the courses are arranged so that the student may, at a later date, complete the four-year course with a minimum loss of time. While these short courses are designed to develop a broader understanding of the 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 Division.

To qualify for this Certificate, the student must:

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

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

In the School of Engineering and Technology, definite programs of study are prescribed leading to certificates of completion within definite fields of applied industrial work. These curricula may be found in the section entitled "School of Engineering and Technology."

### **Requirements for the Degree of Bachelor of Science**

The College confers the degree of Bachelor of Science in Agriculture; Forest, Range and Wildlife Management; Arts and Sciences; Agricultural Engineering; Civil Engineering; Commerce and Business Administration; Home Economics; Education; Industrial Education, or Technology upon students who meet the requirements specified herewith:

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

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

### **Summary of Requirements for Graduation**

For students who will graduate in the spring of 1954, the following requirements must be met after the requirements for admission have been met. Responsibility for satisfying the requirements for graduation rests upon the student concerned.

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

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

The advanced course consists of the third and fourth year of Military Science. Entrance upon the advanced course is elective, but once entered upon, the course

becomes a prerequisite for graduation, unless the student shall be discharged in accordance with the provisions of Army Regulation 145-350 or Air Force Manual 45-2.

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

4. Sixty credits of Upper Division work.

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

6. The completion of the group requirements and of 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, George-Barden Teacher Training, Engineering and Technology.

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

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

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

10. Four passing grades, "A," "B," "C," and "D" are employed in reporting credit. No credit with grade lower than "D" can count toward satisfying credit requirements. 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 credit of "D." A deduction of one grade point is made for each hour of failure. For graduation, a student must have as many grade points as he has credits for which grades of "A," "B," "C," "D," and "F" have been assigned. Credits of "P" grade are disregarded in computing grade point averages.

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

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

13. The candidate must have discharged all College fees.

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

### Requirements for High School Teacher's Certificate

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



## GRADUATE SCHOOL

J. STEWART WILLIAMS, DEAN

### Organization

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

The Graduate Council for 1952-53 is as follows:

School of Agriculture—Professor Leonard H. Pollard  
 School of Arts and Sciences—Professor Eldon J. Gardner  
 School of Commerce—Professor Evan B. Murray  
 School of Education—Professor Arden Frandsen  
 School of Engineering—Professor M. Greaves  
 School of Forest, Range and Wildlife Management—Professor  
 Laurence A. Stoddart  
 School of Home Economics—Professor Ethelwyn B. Wilcox  
 Libraries—Professor King Hendricks

### Admission to Graduate School

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

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

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

### Master's Degree

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

**Qualifying Examinations:** A qualifying examination is required by the Graduate School and may be taken prior to registration. If not taken, this examination and any qualifying examination required by the student's department must be taken as soon as possible after registration. The results of these examinations become a part of the student's file in the graduate office. If a student is found to be deficient in the work basic to the field in which he proposes to study, he may be required to take undergraduate courses, which do not count in the minimum requirements for the Master's degree, to satisfy the deficiency.

**Supervisory Committee:** When it has been determined that a student is acceptable as a possible candidate for a higher degree, the major professor will suggest a committee to assist in guiding the student's program and in conducting necessary additional qualifying examinations and the final examination. When the student's program has been determined and approved by his committee, he will be advanced

to candidacy for a degree. Advancement to candidacy must be accomplished before the end of the winter quarter if the student is to graduate at the following commencement. When the student's research is best supervised by a federal collaborator, or other person who is not a member of the regular teaching staff, such collaborator or other person may be designated as thesis director. This thesis director is a member of the student's committee.

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

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

**Thesis:** Each candidate for a Master of Science degree, usually must present a thesis on a topic within the field of his major subject which must represent from 9 to 15 hours of the credit presented for his degree. The thesis must be a contribution to the field of knowledge, based on the student's own research, or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be typewritten in standard form; and a copy must be submitted to each member of the student's Advisory and Examining Committee at least two weeks before the date of his final examination. After approval by the committee and the department, and after the student has successfully passed the final examination, four copies of the final draft of the thesis must be deposited in the graduate office. Two of these copies will be deposited in the library, another sent to the department, and the fourth returned to the student.

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

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

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

**Time Limit:** Work for a Master of Science degree must be completed within six years from the date of matriculation as a regular student in the Graduate School if the work is done wholly or in part during the regular academic year. If the work is done entirely in summer sessions, a maximum of seven years is allowed. Older work may be revalidated by examination.

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

**Transfer Credit:** A maximum of 9 quarter credits of graduate work satisfactorily completed at another approved Graduate School may be allowed toward a Master of Science degree. The extent to which such credit may reduce either the course

or the residence requirements will be determined by the student's committee.

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

### Degrees of Civil Engineer and Irrigation Engineer

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

**Special Requirements:** The student program for these degrees include:

1. A minimum of 6 quarters of study, of which at least 3 quarters must be in residence at Utah State Agricultural College.

2. Completion of 90 credits of approved courses.

3. Completion of a minimum of 30 credits of graduate courses (200 series), exclusive of thesis.

4. Completion of an adequate thesis based on a research program for which a maximum of 30 credits may be allowed by the committee.

For candidates who present the Master of Science degree in an appropriate field of engineering, and who have completed a thesis project for this degree, the requirements will be modified as follows:

1. A minimum of 3 quarters in residence.

2. Completion of a suitable program of study of not less than 45 credits, of which

(a) at least 30 credits must be graduate courses (200 series, and which may include

(b) a maximum of 20 credits for thesis.

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

### Degree of Doctor of Philosophy

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

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

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

1. Three years of full-time graduate study above the Bachelor's degree. If the student has a Master's degree, then two years will be required. The student's supervisory committee may recommend that part of this program be taken at other schools, but the last year must be spent in residence at Utah State Agricultural College;

2. A minimum of 135 credits of approved graduate study beyond the Bachelor's degree, 90 credits beyond the Master's degree;

3. A major field to which approximately two-thirds of the program is devoted, and a minor field to which approximately one-third of the time is devoted. The minor may be divided between two suitably related areas. A Master's degree in a suitably related area may satisfy the minor requirement.

4. A research problem on which a thesis will be presented. Credits for this thesis may not exceed 45, and work on the thesis should ordinarily occupy most of the third year, but may be carried on with course work throughout the program.

**Language Requirement:** A reading knowledge of at least one foreign language is required of all candidates. The particular language required will be that which meets best the applicant's needs. Requirement of a second language will be optional with the department in which the student is taking his major. The degree of proficiency of the applicant to use the required language in his chosen field and

his knowledge of the grammar and structure of the language will be determined by a committee appointed by the Dean of the Graduate School from members of the Language department.

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

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

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

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

### Teaching and Research Assistantships

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

### Graduate Programs in Education

The following degrees are offered in the field of Education:

**Master of Science.** The Master of Science degree is awarded to those students completing a full year of graduate work in specified courses and writing a research thesis for which 9 to 15 credits is allowed. The thesis requirement may be fulfilled by the writing of two field studies.

**Master of Education.** The Master of Education degree is granted in each of the following areas:

- Master of Education in School Administration and Supervision
- Master of Education in Secondary Education
- Master of Education in Elementary Education
- Master of Education in Vocational Education

The course of study leading to the Master of Education degree in each of the above areas has for its purpose the preparation of thoroughly prepared teachers, supervisors, and administrators. It aims at providing a broad foundation in the field of education and in the particular area of specialization, and differs from the Master of Science degree by providing more flexible requirements designed to meet the specific needs of the individual student. This professional degree emphasizes proficiency in the interpretation and application of research.

**Doctor of Education.** The professional degree of Doctor of Education is designed especially to prepare for leadership and expert service in the field of education. Requirements for this degree include the development of a high degree of competence in an area of specialization in education plus a thorough development of skills and knowledge of the broad field of education and in a supplementary field other than professional education.

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

### Graduation

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

## STUDENT FEES

### Resident Students

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Registration .....	\$10.00	\$	\$
Tuition .....	21.00	21.00	21.00
Building .....	7.00	7.00	6.00
Student Body .....	6.00	3.00	3.00
Athletic .....	2.00	2.00	2.00
Class Fee .....	1.00		
Total Fees .....	\$47.00	\$33.00	\$32.00

### Non-Resident Students

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Registration .....	\$10.00	\$	\$
Non-resident .....	35.00	35.00	35.00
Tuition .....	21.00	21.00	21.00
Building .....	7.00	7.00	6.00
Student Body .....	6.00	3.00	3.00
Athletic .....	2.00	2.00	2.00
Class Fee .....	1.00		
Total Fees .....	\$82.00	\$68.00	\$67.00

### SPECIAL FEES

Change of Registration Fee (applies after first week of each quarter) .....	\$ .50
Special Students—Registration fee .....	10.00
Plus \$2.50 per credit hour (maximum 6 credits)	
Visitor Fee—Registration as listener or visitor in lecture course in which no credit is desired, per quarter, per subject .....	5.00
Qualifying Examination—Graduate School	
1 part .....	5.00
2 parts .....	6.00
Graduation Fee .....	10.00
Social Work Certificate .....	5.00
Teacher Placement Fee .....	2.00
Teacher Placement re-registration .....	1.00
Locker Rental—Fall, Winter and Spring .....	1.50
Fifty cents of this fee is refunded to students upon returning key accompanied by receipt, prior to the first Friday following Commencement exercises.	



Transcript of Credits. Each student is entitled to one transcript free.	
Additional transcripts .....	.25 to .50
Progress Report. Adviser furnished one copy free. Additional copies.....	.25 to .50
Note fee .....	2.00
Cap and Gown rental—Bachelor of Science .....	2.25
Master of Science .....	5.00
Master's Degree Fee for binding and proofing thesis .....	5.00
School of Forest, Range, and Wildlife Management—Senior Field Problems:	
Forestry 146 .....	35.00
Range Management 196 .....	30.00
Wildlife Management 171 .....	35.00
Chemistry Laboratory Breakage Deposit .....	5.00
Geology 3 Laboratory Breakage Deposit .....	5.00
Military Uniform Deposit .....	5.00
The above deposits are refundable, except for breakage, upon presentation of clearance slip from department concerned—accompanied by receipt showing that payment was made.	
Late Registration per day (maximum \$5.00) .....	1.00
The late fee will be assessed:	
(a) For late registration resulting from late filing of application and credentials for admission or for readmission; or	
(b) For late registration resulting from failure to begin registration on scheduled registration dates; or	
(c) For delay in completion of registration.	

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

**Special Examination**—for credit—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.

**Thesis Credit**—Graduate students not in residence and wishing to file thesis credit not to exceed 15 hours shall pay a fee of \$27.00.

#### Private Instruction Fees

Music—The charge is on the basis of 1½ credit hours per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

Christiansen, N. W. ....	\$35.00	Pahtz, George .....	\$30.00
Christiansen, Mrs. N. W. ....	30.00	Poznanski, Mischa .....	30.00
Clark, S. E. ....	30.00	Thatcher, Patience .....	35.00
Dalby, John Philip .....	30.00	Torbensen, Eldon .....	30.00
Dalby, Max .....	30.00	Wasserman, Irving .....	30.00
Greenwood, Maxine .....	25.00	Walti, Walter .....	35.00
Lundquist, Thelma .....	20.00	Walti, Mrs. Walter .....	30.00
Odd, Mrs. Wallace .....	20.00		

**Speech**—The fee for Speech 12 and 112 is \$17.50 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

Hansen, Burrell	Myers, Chester J.	Thornley, Gwendella
Morgan, Floyd T.	Robinson, Rex E.	

**Refunds**—All fees paid, with the exception of the \$10.00 registration fee, will be refunded to any student in residence who withdraws from school before the end of the quarter, in proportion that the number of instructional weeks subsequent to withdrawal bears to the number of instructional weeks in the period covered by the fees paid. No refund of the \$10.00 registration fee is made.

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 \$6.00.

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

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

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

Good board and room in private homes cost from \$12.00 to \$15.00 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 damage done by them to 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. Two copies of the complete thesis are to be filed in the College library.

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

The Danforth Summer Fellowship is awarded jointly by the Danforth Foundation and Ralston Purina Mills to an outstanding Junior in the School of Agriculture. The award covers expenses for two weeks in St. Louis and vicinity, and two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. Forty students from as many colleges are awarded this fellowship. Additional information and application blanks may be obtained from the Dean's office. Applications should be filed with the Dean on or before April 1.

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



**Louisa Y. Robinson National Woman's Relief Society Scholarship.** A gift of \$5,000 from the General Board of the National Woman's Relief Society creates a perpetual fund, the annual earnings of which are given to a Latter-day Saint woman student eligible for admission to the Graduate Division of Social Work. A research paper is required. Applications should include a transcript of credits and three letters of recommendation, one of which must be from the Ward Relief Society president of the ward in which the student lives. One hundred dollars is payable November 1 and the rest on May 1, provided the research paper has been submitted and adjudged satisfactory.

**Sears Roebuck and Company Scholarship.** 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 \$25 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 who has the best scholarship record at the end of his freshman year receives an additional scholarship for one or two more years. All applications must be submitted to the Dean before June 1. Application blanks and information may be obtained from the Dean's office.

**Borden Agricultural Scholarship Award** of \$300 is given to the student who in all college work preceding his senior year has achieved the highest average grade among students in agriculture completing two or more dairy subjects.

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

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

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

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

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

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

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

**Faculty Women's League Annual Freshman Scholarship** provides tuition for one year for a freshman woman. Selection is based on need, scholarship, and leadership. High school seniors should make application to the Dean of Women before May 1.

**Swift and Company Essay Contest.** Each year Swift and Company conducts an essay contest. The winner is awarded a trip to the International Livestock show, Chicago, where he spends approximately a week studying meat packing. All essays must be submitted 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 awarded each year to a Senior student in Agriculture who has exhibited the greatest measure of constructive organization and leadership in the School of Agriculture through his College course.

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

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

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

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

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

**The Phi Upsilon Omicron Scholarship** of \$25 is given annually by the Kappa Chapter of that organization to the Freshman girl in the School of Home Economics ranking highest on the following points: (a) scholarship; (b) participation in student activities; (c) service and cooperation; (d) leadership; (e) moral character; (f) judgment and reliability. The candidate must be a member of the Home Economics Club.

**Danforth Foundation Home Economics Fellowships.** The first is awarded jointly by the Danforth Foundation and the Ralston Purina Company to an outstanding junior in the School of Home Economics. The award provides for two weeks' study of business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan.

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

**Home Economics Awards.** Certificates of merit are conferred annually upon senior women in Home Economics adjudged worthy by faculty and seniors upon the following basis: (a) application of Home Economics ideals to daily living, 50 points; (b) leadership in class work and other activities, 50 points. The number of awards shall not exceed 5% of the total graduating class. Candidates shall have a grade point average of two or better.

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

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

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

**Eric W. Ryberg Scholarship.** A grant of \$200 from the Utah Sand and Gravel

Company is made to a student in Civil Engineering selected by a special committee. Application should be made to the Dean of the School of Engineering by December 1.

**The Eric W. Ryberg Memorial Scholarship in Commerce**, sponsored by Eric C. and Maridean M. Ryberg, is awarded annually to a Junior, Senior, or graduate student in the School of Commerce (preferably one majoring in Business Management). The award is made on the basis of scholarship, character, personal interest in and adaptability to the field of Business Administration, and need. This scholarship carries a stipend of \$200.

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

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

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

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

**Deseret News Professional Internship.** The News offers the outstanding junior student in journalism a scholarship including one year's tuition at the College and employment with the News, either at Salt Lake City or at one of its bureaus, during the summer between the junior and senior years. The winner is selected by judges representing U. S. A. C. and the News.

**Herald-Journal Scholarship in Journalism.** The Logan Herald-Journal annually presents a \$50 scholarship at the beginning of the Winter Quarter to help some worthy journalism student continue in college.

**Cache Valley Chapter of the Utah State Historical Society Award.** The Cache Valley Historical Society offers annually an award of \$25 to the U. S. A. C. student writing the best acceptable treatise on any phase or field of Cache Valley history. Papers must be submitted on or before the end of the Spring Quarter and become the property of the Cache Valley Historical Society.

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

### 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 Medallion to the male senior student 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 records 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.

**William Alger Awards.** A gold key is awarded annually by Alpha Epsilon Delta, pre-medical society, to the outstanding Freshman pre-medical or pre-dental student. Scholarship, character and possibilities in medicine or dentistry represent the basis for the award.

**Blue Key Award.** Each year Blue Key Honorary Service Fraternity awards a "service plaque" to an outstanding freshman or sophomore male student. Candidates are judged on college activities, scholarship, service to the College, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

**Faculty Women's League Scholarship Award** is awarded to Senior women and is based on scholastic records for full undergraduate work. To be eligible for this award, candidates must have spent at least two years at this institution.

**Faculty Women's League Democracy Award** is awarded to Senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to college life, as exemplified by the following considerations: (1) Awareness of issues vital to college life, (2) individual responsibility for their solution, and (3) accommodation of individual interests to what seems to be the common good.

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

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

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

A College Award is also conferred annually upon the woman student of the Institution who shows evidence of greatest measure of (a) potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points); and (b) womanly qualities, development of the social graces, not necessarily social prominence, and attitude of mind (50 points).

**Tool Engineers' Award.** A Tool Engineer's Handbook and the society's pin are awarded each year to the tool engineering student who is outstanding in scholarship and personality.

### **Loan Funds**

**U. S. A. C. Faculty Women's League** has a loan fund for women students of the College. Loans may range from \$50 to \$150. Preference is given Seniors. Loans are made at any time when money is available.

**U. S. A. C. Faculty Women's League Revolving Loan Fund** provides for short time loans, not to exceed \$20, to women students for emergency purposes. It is administered by the Dean of Women.

**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.

**Robert L. Judd Loan Fund** was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and need financial assistance. The fund is administered by a committee consisting of the Controller, the Dean of Students, and Mrs. Phillip A. Bullen.

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

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

## **STUDENT PERSONNEL SERVICES**

The student personnel 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. Every member of the faculty serves in some guidance capacity.

Instructional phases of the guidance program are centered in the offices of the academic deans. Each dean selects members of his staff to serve as advisers to students in his school.

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

The Dean of Women is co-ordinator of the campus co-curricular program as counselor for women students generally, and as adviser to women's organizations.

The Coordinator of Counseling Services is in direct charge of the Faculty Advisory system and counseling plan. Students who have personal and social problems, including social orientation, emotional conflicts, marital difficulties, educational and vocational planning needs, low scholarship and other similar problems receive special attention.

### **PSYCHOLOGICAL CLINIC**

The Department of Psychology conducts, as a means of giving graduate students clinical experience, a psychological clinic with services 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 officers. This service is operated in close cooperation with the Student Personnel Office; students wishing to utilize the services of the clinic should make arrangements through the Student Personnel Office. 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 recommendation 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 defects.
6. Administration of tests to determine matriculation status of students who have not completed their high school requirements.

Students desiring appraisal of ability, interests, etc., may receive this service through the Department of Psychology.

### **Marriage Counseling Service**

The Department of Sociology and the Division of Social Work conduct a marriage counseling service for all students and their families, without cost. The services include:

1. Dating and courtship guidance.
2. Pre-marital consultation.
3. Social hygiene consultation.
4. Diagnosis and consultation regarding problems of marital conflict, parent-child relations.
5. Diagnosis and referral of more specialized problems to medical, psychiatric, legal, and other specialists.

Consultation by appointment only. Call in person or phone the Secretary of the Department, Room 209 Main.

### **College Citizenship**

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

- A. The College has a long tradition of no smoking in College buildings.
- B. Alcoholic beverages are not used on campus, in college-supervised living quarters, or at any social function. Intoxicated individuals may be requested to leave college functions.
- C. A code of personal honor is traditional at Utah State Agricultural College. Cheating is neither condoned nor accepted.
- D. The friendliness and informality at Utah State are vital to the success of the College. As an Aggie, you have an obligation to be friendly.
- E. A good citizen pays his bills. Now that you are on your own on the Aggie Campus, you should pay yours."

Aggie Bluebook, 1951-52, p. 20

### **Religion**

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

Outstanding religious leaders of the Latter-day Saint, Protestant and Catholic faiths cooperate with the College in serving the students of their respective churches. Accredited courses in religion are also offered by scholars representing each of these groups. An L. D. S. Institute, with a staff of four well trained instructors and an enrollment of more than 900 students, is adjacent to the campus.

## Student Health Service

The following medical service is available to students on the U. S. A. C. Campus:  
1. Physical examinations are required of all new students and of all who participate in athletic and physical education activities.

2. Students are encouraged to have their family doctor give the examination and report on a form provided by the Health Service. If this is not possible the Health Service will give the examination without cost.

3. It is highly recommended that students purchase the Student Accident Insurance available to them.

4. A speech and hearing examination is required of all new students upon entering the College. Arrangements should be made in the Speech Clinic, M377.

### Student Medical Service, Student Union Building

#### Office Hours:

8 a.m. to 5 p.m. daily.  
10 a.m. to 12 noon Saturday

#### Staff Hours:

Nurse—8 a.m. to 5 p.m.  
M.D.—9 a.m. to 12 noon; 1:30 p.m. to 3:30 p.m.  
Receptionist—9 a.m. to 4 p.m.

### Student Service

Available to all registered students without cost.

#### I. Regular dispensary care.

1. Consultation on health matters.
  - a. entrance
  - b. recheck for follow-up
3. Care for all emergencies such as: fractures, sprains, bruises, dislocations, cuts, sutures, and all ordinary health matters requiring medical and minor surgical attention.
4. X-rays for injuries—fractures, etc.
5. Consultations for all different cases when needed.
6. Inoculations and immunizations.

Note: This includes all the care regularly given in any Doctor's office or clinic.

#### II. These services are intended to cover the resident student while on the campus between the hours of 8 a.m. and 5 p.m., and students off the campus in a school supervised activity.

#### III. Does not include:

1. Emergencies occurring off the Campus.
2. Emergencies occurring out of town.
3. Chronic illness originating before entrance to school.
4. Hospital care for any condition.
5. Major surgery.
6. Services to wives or children of students.

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

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

#### VI. In case of illness or an emergency, call:

1. U. S. A. C. Health Service, Ext. 51.
2. Dr. Preston, Telephone 1000.
3. Ann Burns, Telephone 1004-M.

#### VII. All night calls clear through Dr. Preston, Telephone 1000, Dr. E. L. Hansen, Telephone 1036 or Dr. Merrill C. Dains, Telephone 1104.



### **SPEECH CLINIC**

The Speech Clinic provides special classes for persons having speech handicaps and to help 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.

In addition to the speech and hearing examination required of all new students, remedial training is also available for all. 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.

### **STUDENT EMPLOYMENT**

Many students attending the College find it necessary to engage in part-time employment. When need exists and students have the ability to carry both an academic load and part-time work, the Office of Student Employment (Main 133) stands ready to aid in locating work.

### **FINANCIAL AID**

There are many scholarships, fellowships and awards available at the U. S. A. C. Mr. C. L. Pocock, Main 133, aids with tuition and other scholarships; Dr. J. E. Ricks, Library 302, Awards and Honors; Dr. M. L. Nielson, Main 360C, Fullbright and Foreign Scholarships; and Dr. C. Jay Skidmore and Miss Mae Welling, Main 133, student loans.

### **SERVICES FOR FOREIGN STUDENTS**

In meeting the needs of students from foreign lands, the Registrar's Office cares for acceptance and admissions, registration, withdrawals, reports to the Immigration Service and "extensions of stay" in the U. S. The Dean of Students cares for counseling, community relationship, work permits, money matters, etc. Newcomers are aided in their adjustment by a Cosmopolitan Club and through suggestions made by a Faculty Advisory Committee for foreign students.

### **HOUSING**

All requests for housing information, application, or reservations are made at the office of the Director of College Housing, Main 133. Reservations can be made here for college-operated housing, and lists of downtown housing possibilities are also kept current and made available to those seeking housing.

Another source of housing is that provided by fraternities for their members. Information concerning this can be obtained at the Student Personnel Office, Main 133.

## **COURSES OF INSTRUCTION**

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

Courses numbered below 100 are Lower Division courses.

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

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

The amount of credit in quarter hours for a course and the quarter in which the course is given are indicated in parentheses at the end of the course description. "F" is the abbreviation for Fall, "W" for Winter, "S" for Spring, and "Su" for Summer.

## SCHOOL OF AGRICULTURE

R. H. WALKER, DEAN

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## SCHOOL OF AGRICULTURE

**R. H. WALKER, DEAN**

**A. J. MORRIS, ASSISTANT DEAN**

The best trained person receives the best employment opportunities in agriculture as in other occupations. Opportunities in crop and livestock production, marketing, extension work, teaching, research, positions in agriculture in the foreign service, and in various businesses related to agriculture await students who have adequate technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest, and disease control methods are needed to rehabilitate under-developed territories. Increase of soil fertility by prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution. Thus a great opportunity and a challenge await students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

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

Instruction includes both the principles and practice of agriculture. The college farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards, and technical equipment offer excellent opportunities for combining scientific study with practical experience. Outstanding representatives of principal livestock and poultry breeds best adapted to Utah conditions afford a "standard of perfection" in desirable type and form for the student judge.

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

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

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

### CURRICULA IN AGRICULTURE

Students entering the School of Agriculture may pursue one of three courses leading to the Bachelor of Science degree in Agriculture, as follows:

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

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

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

### GENERAL AGRICULTURE

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

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

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

(a) Minimum Requirements in Following Divisions:

	Credits
Agricultural economics .....	9
*Applied plant sciences .....	26
**Applied animal sciences .....	26
Engineering and technology .....	9
Total .....	70

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

	Credits	Total
<b>Physical Science</b>		
Math. 34 or 35 .....	3 or 5	
Chem. 10, 11 & 12 or 3, 4 & 5.....	15	18 or 20
<b>Biology</b>		
Botany 24 or 25 .....	5	
Bacteriology 10 or 70 & 71 .....	5	
Zoology 2 or 3 & 4 .....	5 or 10	
Zoology 112 .....	5	
Entomology 108 .....	5	
Botany 130 .....	5	30 or 35
<b>Social Science</b>		
Principles of Economics 53 .....	5	
Other social science courses (See College group requirements) .....	5	10
<b>Language and Arts</b>		
Eng. 10 & 110 .....	9	
College group requirement (See College group requirements) .....	8	17
<b>(c) Military Science or Physical Education</b>	6	6

81 to 88

Total credits prescribed .....	151
Elective .....	35
Total .....	186

\*Courses to be selected from agronomy, horticulture, and vegetable crops.

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

Soils 56 is required as part of the 26 credits.

**SPECIALIZED AGRICULTURE**

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

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

He must also complete the following:

Mathematics 34 or 35

Chemistry 10, 11 & 12 or 3, 4 & 5

(Majors in agricultural economics may substitute Physical Science 31 and 32 and another 5 hours of exact science for 15 hours of chemistry)

A minimum of 14 credits in the following courses:

Botany 24 and 25

Zoology 2, 3 and 4

Bacteriology 10 or 70, 71

Zoology 1 or Botany 1

Physiology 4

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

Prin. of Econ. 53, 5 credits; Ag. Econ. 58, 63, 6 credits

Social science group, 8 credits

Language and arts groups, 8 credits

English 10 & 110

Agron. 56

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

**TECHNICAL COURSES**

For students who plan to do graduate work or to enter employment in which technical training is required, a technical course is provided in each of the following subjects: Agricultural Economics, Agricultural Mechanics, Animal Husbandry, Bacteriology, Botany, Dairy Husbandry, Dairy Manufacturing, Field Crops, Soils, Soils and Irrigation, Soil Conservation, Zoology, Entomology, and Physiology. Students may register for these courses only upon permission of the Department and the Agricultural Council. Minimum requirements in addition to the general college group requirements include two 3-credit courses in two departments in both applied plant sciences and applied animal sciences, a 5-credit course in principles of economics and a 3-credit course in agricultural economics.

**NON-DEGREE COURSE IN AGRICULTURE**

The School of Agriculture offers a 2-year non-degree course in practical agriculture for students who do not wish to take more than two years of college work. A student may register for any of the regular non-prerequisite production, marketing and management courses in the School of Agriculture. Practical farm problems are emphasized.

In addition to completing a 20-credit major in the plant sciences, the animal sciences, or agricultural economics, the student is required to take six credits in the groups in which he does not major. For example, a student majoring in animal science must complete in addition to 20 credits in his major field, 6 credits in plant science, 6 credits in agricultural economics, and 6 credits in agricultural engineering. He is also required to take the following courses:

Biology, 5 credits; English 10, 5 credits; Physical Science, 5 credits; and Social Science, 5 credits.

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

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

## Agricultural Economics and Marketing

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

G. T. Blanch, Professor and Head of Department; V. L. Israelsen, Professor; R. H. Anderson, E. M. Morrison, Associate Professors; Wells M. Allred, Assistant Professor; Lynn H. Davis, Instructor; Carole N. Maughan, Research Assistant; M. H. Taylor, Leon C. Michaelson, Extension Economists.

W. P. Thomas, Professor Emeritus.

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.

Students graduating from the School of Agriculture must satisfy requirements for graduation from that school, in addition to completing all courses required by the Department for students majoring in the School of Agriculture. Those graduating from the School of Commerce must satisfy the requirements of that school, and in addition complete the other courses required by the Department.

Students interested in graduating from the technical course in this Department may obtain a schedule of the prescribed course of study from the office of the Department.

**Master of Science Degree.** The Department of Agricultural Economics offers opportunity for research and graduate study leading to a master of science degree. The facilities of the department for training graduate students in general agricultural economics, farm management, land economics, agricultural finance, marketing, and prices are augmented by the research investigations conducted by the departmental staff with the assistance of graduate students. The following courses in Agricultural Economics given by the Department may be used for graduate credit: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122, 123, 155, 163.

A minimum of five credits in principles of economics is prerequisite to all courses in agricultural economics.

### Suggested Course of Study for Major in Agricultural Economics in School of Agriculture

Exact Sciences:		Economics:	
Course	Credits	Course	Credits
Math. 34 .....	3*	Ag. Econ. 53 .....	5‡
Math. 35 .....	5*	Economics 107 .....	3‡
Chem. 10 .....		Economics 108 .....	3‡
or Physical Sci. 31 .....	5‡	Economics 155 .....	3
Chem. 11 .....		Economics 165 .....	3
or Physical Sci. 32 .....	5‡	Other .....	3
Chem. 12 or 5 hrs. in			
another exact science .....	5‡	Total .....	20*
Total .....	23	*A minimum of 15 credits required	

\*One of these is required



**Biological Sciences:**

Course	Credits
Zool. 1 or Botany 1 .....	5
Bact. 10 or 70 & 71 .....	5
Physiology 4 .....	5
Total .....	15*

\*14 credits required

**Social Sciences (Excl. Econ.):**

Sociology 10 .....	5‡
Pol. Sci. 10 .....	5
Sociology 141 .....	3
Total .....	13

**Languages and Arts:**

Speech 1 .....	5
English 40 .....	5
Totals .....	10*

\*A minimum of 8 credits required

**English Composition:**

English 10 .....	5‡
English 110 .....	4‡
Total .....	9

Military Science or  
Physical Education ..... 6‡  
‡These are equivalent course re-  
quired.

**Agricultural Engineering:**

Course	Credits
Irrig. & Drainage 10 or 112....	3 or 4
Ag. Eng. 15 .....	3
Ag. Eng. 105 .....	5
Total .....	13 or 14

**Journalism:**

Journalism 12 .....	3
Journalism 120 .....	3

Totals ..... 6  
‡These or equivalent courses re-  
quired

**Business Administration:**

Course	Credits
Accounting 109 .....	3
Accounting 110 .....	1
B. A. 25 .....	5
Other .....	6

Total ..... 15\*

\*A minimum of 9 credits required

**Applied Plant Science and Soils:**

Agron. 56 .....	4‡
Agron. 6 .....	1
Veg. Crops 1 .....	3
Hort. 1 .....	3
Other .....	7

Total ..... 18\*

\*A minimum of 15 credits required

**Applied Animal Sciences:**

An. Hus. 1 .....	3
An. Hus. 10 .....	5
Dairy 1 or 109 .....	3
Poultry 1 .....	3
Other .....	4

Total ..... 18\*

\*A minimum of 15 credits required

**Major:**

Course	Credits
Ag. Econ. 58‡,	
63‡, 102, 105,	
106, 112, 120, 121‡,	
122‡, 155, 163	
Total .....	35

**Rural Economy**

**53. Principles of Economics.** Basic principles of economics with emphasis on those of special importance in agriculture. Required of all students majoring in School of Agriculture. (5F, W, or S) **Israelsen and Staff**

**104. Economic Development of Agriculture.** Geography and use of agricultural resources with special reference to the United States. Taught alternate years, not taught 1954-55.

**155. Agricultural Laws.** A survey of laws of particular concern to those engaged in agricultural pursuits. Some special attention is given to laws of direct and immediate interest to Utah farmers. (3W) **Israelsen**

**230, 231, 232. Public Problems in Agriculture.** An economic consideration of selected problems and government programs and policies affecting agriculture. For the next year major attention will be given farm price supports, foreign trade and public lands and water. (1F, W, S) **Staff**

**235, 236, 237. Seminar.** For senior and graduate students, all of whom are expected to attend whether registered for credit or not. (1F, W, S) **Staff**

### **Farm Management, Land Economics, and Agricultural Credit**

**58.....Introductory Farm Management.** A case-problem approach to the basic considerations of organizing the productive resources of a farm using the farm plan, using labor and power efficiently, and measuring the farm business success. Required of all students majoring in School of Agriculture. (3F, W, S) **Morrison and Blanch**

**70. Farm Accounts.** Farm accounts and their application to the organization and management of farms and to filing of income tax statements. **Morrison**

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

**105. Agricultural Credit.** Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. Prerequisite or taken simultaneously: Agr. Econ. 58 (3F) **Morrison**

**106. Land Economics and Utilization.** Economic principles underlying utilization, valuation, and tenure of agricultural land. Attention given prevailing land policies and methods and techniques involved in dealing with problems of land use. (5S) **Blanch**

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

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

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

### **Marketing and Prices**

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

**63. Marketing Agricultural Products.** Economic principles, marketing agencies, functions, and channels of distribution. Required of all students majoring in School of Agriculture. (3F, W, S) **Allred and Anderson**

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

**113. Analysis of Farm Cooperatives.** Primarily to give advanced training and experience in agricultural cooperation. Prerequisite or taken simultaneously: Agr. Econ. 112. Taught alternate years. (2F) **Thomas**

**114. Marketing Fruits and Vegetables.** Principles of marketing applied to marketing of fruit and vegetables. Taught alternate years. Not taught 1954-55.

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

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

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

**121. Statistical Methods.** Statistical methods used in analyzing prices and other economic data. (5F) **Israelson**

**122. Statistical Methods.** Interpretation of statistical data and application techniques to specific price and production problems. Prerequisite: Agr. Con. 121. (4W) **Israelson**

**163. Intermediate Marketing.** Principles of marketing and their application to specific problems. Prerequisite: Agr. Econ. 62 or 63. (3F) **Anderson**

### General Graduate Courses

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

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

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

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

## Agricultural Education

**S. S. Richardson**, Professor and Head of Department; **Eldon Drake**, Assistant Professor.

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

### Master of Science Degree

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

### Prescribed Course for Majors in Agricultural Education Institutional and General Requirements

Biological Sciences:		Cr. Tot.	Social Sciences:		
*Botany 24 .....	5		*Agr. Econ. 53 .....	5	
*Zoology 2 .....	5		*Sociology 10, or 70, or		
Zoology 112 (Genetics) .....	5		*Political Science 10, or		
*Bacteriology 10, or 70 & 71..	5	20	*History 14 .....	5	10
Language and Arts:		Cr. Tot.			
*Landscape Architecture .....	3				
*Speech, or Music, or					
*Art or Literature .....	5	8			
English:			Exact Science:		
Sophomore Composition			*Chemistry 10, 11, 12 .....	15	
(10) .....	5		*Mathematics 34 .....	3	
Advanced Composition			Radio 21, Physics 3 or 6 or 7,		
(110) .....	4	9	Geology 3 .....	4	22
			Total .....		69

\*Courses which meet lower division group requirements.

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

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

Animal Industry‡		Cr. Tot.		Education		Cr. Tot.	
An. Hus. 10	.....	5		Education 112, 113, 114, 125,	.....	22	
Elective	.....	15	20	126	.....	5	
			—	Psychology 102	.....	3	
				Public Health 155	.....	3	
				Elective	.....	3	33
							—
Plant Industry‡				Total Minimum Requirements			
Agron. 56 (Soils	.....	4		For B. S. Degree			
Elective	.....	16	20	Institutional and General	.....	69	
			—	Agriculture	.....	80	
				Education	.....	33	
				Military Science & P. E.	.....	6	
							—
Agricultural Economics				Total	.....	188	
Agr. Econ. 58, 63	.....	6					
Elective	.....	5	11				
			—				
Agriculture							
Elective	.....	9	9				
			—				
Agricultural Engineering*							
Irrig. 10	.....	4					
Elective	.....	16	20				
			—				
Total	.....		80				

### Courses

**112. Principles of Vocational Education.** Fundamentals in general and vocational education. Social and economic basis for vocational education. (3W)  
Richardson

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

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

**126. Directed Teaching in Agriculture.** Student observation and teaching under supervision in approved local vocational agricultural departments. Student teachers leave the campus to train in selected high schools for a full teaching program for five or six weeks. (4-8 W or S)

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

**151. Extension Methods.** For prospective home demonstration and county agricultural agents. History, objectives, organization and accomplishments of extension work in the United States. Farm and home problems, youth and adult education, and extension methods. (3W or S)  
Staff

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

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

\*Courses which meet lower division group requirements.

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

## Agronomy

D. W. Thorne, Professor and Head of Department; D. W. Pittman, D. C. Tingey, H. B. Peterson, Professors; W. H. Bennett, G. L. Stoker, S. A. Taylor, LeMoyne Wilson, D. R. McAllister, Associate Professors; Rex Nielson, Assistant Professor; Louis A. Jensen, A. Golden Kilburn, Extension Agronomists; J. W. Carlson, J. L. Haddock, Vern K. Hugie, Orvid Lee, Wesley Keller, C. W. Lauritzen, M. W. Pedersen, J. P. Thorne, F. L. Timmons, R. W. Woodward, L. L. Jansen, E. H. Cronin John W. Metcalf, Collaborators in Research, U. S. D. A.

R. J. Evans, D. S. Jennings, Professors Emeritus.

### Bachelor of Science Degree in Agronomy

Study and research in Agronomy focus upon problems of crop production and soil conservation in arid regions. Course offerings emphasize interrelationships of plants, soil, precipitation, and irrigation water in production of maximum crop yields under a variety of conditions. Four types of majors for the bachelor's degree are offered within the department: General Agronomy, Soil Conservation, Technical Field Crops, and Technical Soils. In addition, a joint major termed Irrigation and Soils is offered between the departments of Agronomy and Irrigation and Drainage.

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

### Major in General Agronomy

A major in General Agronomy prepares the student for positions related to the management of soils and the production of field crops. Training in general agronomy is preparatory to civil service positions such as 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 train students who desire to farm, to be county agricultural agents, or to take field positions related to soils or crop production with various other state and federal agencies. Students majoring in General Agronomy may partially specialize in either crops or soils.

In addition to the general requirements of the college and the School of Agriculture all majors in General Agronomy must take Geol. 3; Bot. 24, 25, and 120 or 130; Bact. 10; Ent. 108; Math. 35, 44; Agronomy 6, 7, 8, 56, 103, 107, 111, 112, 113, 118, 155, and either 109 or 114. A minimum of one summer of practical farm experience is required of all majors in General Agronomy before graduation.

### Major in Soil Conservation

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

In addition to the general requirements of the college and the School of Agriculture, all majors in Soil Conservation must take: Geol. 3 and 115; Bot. 24, 25 and 120 or 130; Bact. 10; Math. 35 and 44; Irrig. and Dr. 10; Engr. Dr. 60 or 61 and 62; Civil Engr. 81 or 84, and 171; Range Mgt. 160; and Agron. 6, 7, 8, 56, 103, 107, 111, 112, 113, 114, 118 and 155. A minimum of one summer of practical farm experience is required of all majors in Soil Conservation before graduation.

### Major in Technical Field Crops

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

In addition to the general college requirement and those of the School of

Agriculture, majors in Technical Field crops must take: Chemistry 3, 4, 5, 125 and 126; Physics 6 and 7; or 17, 18 and 19; or 20, 21 and 22; Math. 99; Botany 24, 25 and 120 or 130; Bact. 10; Irrig. and Dr. 10; and Agronomy 6, 7, 8, 56, 103, 107, 109, 111, 112, 113, 114, 118, 131, 132 and 155. Students interested in Weed Technology should also take Chem. 117.

### **Major in Technical Soils**

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

In addition to the general college requirements and those of the School of Agriculture, students in Technical Soils must take: Chem. 3, 4, 5, 117, 118, and either 125 and 126, or 9 hours of upper division physics as approved by adviser; Math. 99, Physics 20, 21 and 22; Geol. 3; Bot. 24, 25, and 120; Bact. 10, or 70 and 71, Irrig. and Dr. 10; Hort. 1; Agron. 6, 7, or 8, 56, 103, 107, 111, 112, 113, 114, 131, 132, 155, 160, 165. A suggested outline of courses may be obtained from the Agronomy Dept.

### **Major in Irrigation and Soils**

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

An outline of courses with 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 subject pursued. The outline of studies and the research program are designed around the objectives of the individual student. The department in co-operation with related departments, is prepared to give strong programs in various phases of plant breeding, crop production, weed control, soil chemistry, soil physics, soil conservation, soil management, and soils and irrigation.

The following courses are acceptable for graduate credit toward the Master of Science degree in Agronomy: 109, 110, 120, 131, 132, 155, 160, 165; in addition, for students majoring in crops, 107.

The following courses are acceptable for graduate credit toward the Master of Science degree in departments other than Agronomy: 103, 107, 109, 110, 114, 116, 117, 120, 121, 131, 132, 155, 160 and 165.

### **Doctor of Philosophy Degree**

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



**Suggested Course of Study for Majors in General Agronomy**

<b>Freshman</b>		<b>Junior</b>	
Courses	Cr.	Courses	Cr.
Math. 34, 35, 44 .....	11	Agron. 103, 107, 118, 131 .....	14
Bot. 24, 25 .....	10	Bact. 10 .....	5
Soc. Sci. ....	5	Agr. Econ. 53, 58, 63 .....	11
Lit. or Art .....	5	*Ent. 108 .....	5
Agron. 6, 8 .....	4	Eng. 110 .....	4
Poultry 1 & 2 .....	4	Dairy 109 .....	3
Veg. Crops 1 & 2 .....	4	Lib. Sci. 106 .....	1
Hort. 1 .....	3	Phys. 6 .....	5
P. E. or M. Sci. ....	3	Land Arch. 3 .....	3
	<hr/> 50		<hr/> 50
<b>Sophomore</b>		<b>Senior</b>	
Courses	Cr.	Courses	Cr.
Chem. 3, 4, 5, 12 or 10, 11, 12 .....	20 or 15	Agron. 111, 112, 113 .....	3
Geol. 3 .....	5	Agron. 114, 155 .....	8
Eng. 10 .....	5	*Agron. 109 or 165 .....	3 or 4
Agron. 7, 56 .....	8	Bot. 130 .....	5
An. Hus. 10 .....	5	*Zool. 112 or Geol. 115 .....	5
Irrig. & Dr. 10 .....	4	Range Mgt. 160 .....	5
P. E. or M. Sci. ....	3	An. Sci. Elect. ....	6
	<hr/> 45 or 50	*Agr. Ed. 151 .....	3
		Electives .....	10
			<hr/> 48

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

**Farm Crops**

**6. Crops Laboratory.** Morphology, growth habits and identification of crop plants. One 3-hour lab. (1F, W, S) **McAllister**

**7. Grain Crops.** The classification, history and cultural methods involved in the production of grain crops. Prerequisite: Agron. 6. Three lectures. (3W or S) **McAllister**

**8. Root and Miscellaneous Crops.** Sugar beets, potatoes, tobacco and fiber crops are studied as to cultural methods, market types and commercial possibilities. Prerequisite: Agron. 6. Three lectures (3F or W) **Bennett**

**103. Forage Crops.** Alfalfa, clovers, grasses and other farm forages; classification and methods of production, harvesting and storage; meadow and pasture management. The place of forage crops in rotations and soil conservation is considered. Prerequisite: Agron. 6. Three lectures. (3F or S) **Bennett**

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

**118. 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) **Tingey**

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

**121. Seed Analysis and Grading.** Impurities of crop seeds; methods of analysis an dtesting; seed inspection; application of federal standards in the grading of field crops. Prerequisite: Agron. 6. Two 3-hour labs. (2S) **McAllister**

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

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

**203. Sugar Beets and Potatoes.** Recent advances in improvement and production. Prerequisite: Agron. 6 and 8. Two lectures (2F) **Bennett**

**204. Cereal Crops.** Recent advances in the improvement an production of cereal crops. Prerequisite: Agron. 6 and 7. Two lectures. (2S) **McAllister**

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

**209. Advanced Plant Breeding.** The science and practice of plant breeding. Original papers and lectures. Three lectures. (3W) **Tingey**

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

### Soils

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

**57. Introductory Soils Laboratory.** Offers credit for the laboratory of Agronomy 56 for students who have had a general soils course without a laboratory. One credit. Given the same as Agron. 56 laboratories. **Staff**

**58. General Soils.** Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Prerequisite: Inorganic Chem. (Credit not given for both 56 and 58.) Four lectures, one 3-hour lab. (5S) **Pittman**

**107. Fertility and Management of Irrigated Soils.** Methods and amounts of irrigation water application in relation to soils and crops. Fertilizer selection and use in relation to irrigation and soil management. The management and reclamation of saline soils. Organic matter maintenance in soils. (Course may be taken as Agron. 207, 3 Cr. by special permission.) Prerequisite: Agron. 56. Five lectures. (5F or W) **Peterson; Thorne**

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

**114. Soil Conservation and Survey.** Principles and techniques of soil survey and conservation and land classification. Problems of land policy and management and field practice in farm planning. Prerequisite: Agron. 56, and 3 credits in field crop production or range management. Two lectures, 3 lab periods. (5S) **Wilson**

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

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

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

**212. Seminar.** Review of current literature in soil science. Required of graduate students in soil science; open to staff members. One credit per quarter, on conference. (1F, W, S) **Staff**

**214. Soil Physics.** A theoretical discussion of soil as a physical body. The structure of clay minerals and their relationship to absorption and other surface phenomena; soil moisture and air relationships; and soil stabilization are considered. Prerequisites: Agronomy 165 and approval of the instructor. Three lectures. (3S) **Taylor**

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

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

**221. Genesis, Morphology and Classification of Soils.** A critical review of basic principles of soil classification, soil forming factors in relation to generic, morphological and zonal distribution of soils. Prerequisite: Agronomy 114 and 160 or permission of instructor. Three lectures. (3S) **Jennings**

**224. Soil Chemistry.** Composition and reactions of soil colloids. Prerequisite: Approval of instructor. (3F) **Peterson**

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

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

### Special Courses

**111, 112, 113. Agronomy Seminar.** Review and discussion of current agronomic problems and practices. Required of all seniors in department. One lecture. (1F, W, S) **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. Prerequisites: Agron. 7 and 56. Two lectures. (2S) **Pittman**

**117. Geography of Agriculture.** A brief review of the principal agricultural regions of the world, with topography, climate, soils, crops, livestock, population and industries considered in relation to agriculture. Two lectures. (2W) **Pittman**

**131, 132. Applied Statistics.** Sample-based inferences about populations. Individual and group comparisons. Tests of significance. Linear regression and correlation. Analysis of variance and covariance. Multiple regression. Individual degrees of freedom. Prerequisite: Math. 35 or equivalent. Three lectures. (3F, W) **Crandall**

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

**215. Design of Experiments.** Fundamental principles of experimental designs. Completely randomized blocks; latin squares; components of error; confounding; factorial, split plot and incomplete block designs; fractional replication. Prerequisite: Agron. 131 and 132. Three lectures. (3S) **Crandall**

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

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

**256. Data Processing on Electric Accounting Machines.** Adaption of research data to electric accounting machines. Card design. Coding systems. Experimental design. Analysis of enumeration and measurement data. Analysis of variance. Multiple regression techniques. Prerequisite: Research experience or statistical background. Two lectures, one lab. (3W) **Hurst**

## Animal Husbandry

**J. A. Bennett**, Professor and Head of Department; **L. E. Harris**, **G. R. Henderson**, Professors; **R. R. Keetch**, **M. A. Madsen**, **H. Steffen**, Associate Professors; **Doyle Matthews**, **Darrel Matthews**, Assistant Professors; **J. R. Harris**, **D. O. Williamson**, Instructors.

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

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

Graduate study leading toward the Master of Science degree is offered in animal breeding, nutrition, and production. Courses 150, 151, 155 and 175 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the department chairman.

### Suggested Course of Study for Majors in Animal Husbandry

Freshman		Junior	
Course	Credit	Course	Credit
An. Hus. 1 & 2, 40 .....	6	An. Hus. 110, 125, 165 .....	9
M. S. or P. E. ....	3	Dairy 109 or 110 .....	3 or 5
Math. 34 or 35 .....	3 or 5	Agron. 6, 7, 8, or 107 .....	4 or 5
Bot. 24 or 25 .....	5	Agr. Econ. 58, 63 .....	6
Bact. 10 .....	5	Vet. Sci. 120 .....	4
Agr. Econ. 53 .....	5	Zool. 112 .....	5
Soc. 10 or 70, or		English 110 .....	4
Pol. Sci. 10 or Hist. 14 .....	5	Electives .....	5 to 9
Speech 1 or 5 .....	5 or 3		
Vet. Sci. 20 .....	3	Totals .....	45
Electives .....	6 to 10		
Total .....	48		
Sophomore		Senior	
Course	Credit	Course	Credit
An. Hus. 10 .....	5	An. Hus. 150, 155, 160 .....	12
M. S. or P. E. ....	3	Agr. Econ. 116 or 162 .....	3
Chem. 10, 11, 12 or 3, 4, 5 .....	15	Range Mgt. 160 .....	5
English 10 .....	5	Agron. 103 .....	3
Zool. 3 & 4, or 2 .....	10 or 5	Vet. Sci. 140 .....	5
Hort. or Veg. Crops .....	3	Electives .....	17
Agron. 56 .....	4		
Language and Arts .....	3		
Electives .....	0 or 5	Total .....	45
Total .....	48		

**1. Fundamentals of Animal Husbandry.** Livestock production in relation to other phases of agriculture in the United States and Utah, influence of geographical location and conditions, various types of farm animals and functions performed or products produced, and introduction to important factors in successful livestock production. (3F or S) **Steffen**

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

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

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

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

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

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

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

**150. Animal Nutrition.** Attention is given fundamental phases, 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 (4W) **Harris**

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

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

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

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

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



**185. Meats.** Cutting, selection and identification of wholesale and retail cuts of beef, pork, and lamb, with references to prices, relative economy, uses, nutritive value, chemical composition, and palatability. Preparation of meats for the home freezer will be emphasized. (3W) **Matthews**

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

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

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

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

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

**240. Animal Nutrition Research.** Same as A. H. 231, except that research is in some phase of animal nutrition. (2-5 F, W or S) **Harris**

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

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

## Bacteriology and Public Health

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

**W. Whitney Smith**, Professor and Head of Department; **Kenneth R. Stevens**, Professor; **Lewis W. Jones**, Associate Professor; **Garth A. James**, Instructor; **John H. Carlquist**, Special Professor; **Homer Clark**, Special Associate Professor; **Russel S. Fraser**, Special Assistant Professor. Special staff members from the Cache Valley Medical Association.

### Bachelor of Science Degree

Bacteriology majors in Specialized Agriculture should take Bacteriology 10 or 70, 71, 104, 110, 160, 291; Botany 24, 25; Chemistry 10, 11, 12, 190; Mathematics 34 or 35; Physiology 4; Physics 6, 7; Zoology 2 or 3 and 4; Public Health 50.

Bacteriology majors in Technical Agriculture should take Bacteriology 70, 71, 104, 105, 110, 120, 160, 172, 173, 180, 291; Botany 24, 25, 130; Chemistry 3, 4, 5, 117, 118, 125, 126, 191; Mathematics 35, 44; Physics 17, 18, 19; Zoology 3, 4, 116; Library Science 106.

### Master of Science Degree

Graduate courses are offered in various specialized subjects, with strong support from related departments and agencies. Courses 110, 120, 131, 151, 152, 153, 156,



161, 168 and 180 may be used for credit by graduate majors in Bacteriology. These courses and courses 104, 105, 151, 152, 153, 156 and 160 may be modified and used for credit by graduate students in related departments.

### Bacteriology

**10. Elementary Bacteriology.** Basic concepts, practical applications, demonstrations. (Not open to students who offer credit in Bacteriology 70.) Five lectures (5F, W, S, Su) **Smith; Stevens; James**

**70. General Bacteriology.** For majors in science departments. (Not open to students who offer credit in Bacteriology 10.) Three lectures (3F, W, S) **Stevens; Jones**

**71. General Bacteriology Laboratory.** Prerequisite: Previous or concurrent registration in Bact. 10 or 70. Two 3-hour labs. (2F, W, S) **Stevens; Jones**

**101. Systematic Bacteriology.** Classification relationships. Prerequisite: Bact. 10 or 70. Two lectures (2S) **Smith; Stevens**

**104. Dairy Bacteriology.** Microorganisms of milk and its products. Prerequisite: Bact. 10 or 70. Three lectures. (3F) **Jones**

**105. Dairy Bacteriology Laboratory.** Two 3-hour labs. Prerequisite: Bact. 71, and previous or concurrent registration in Bact. 104. (2F) **Jones**

**110. Soil Microbiology.** Relationships of microorganisms to soil fertility. Prerequisite: Bact. 10 or 70. Two lectures. (2W) Taught alternate years. **Stevens**

**120. Food Microbiology.** Relationships of microorganisms to food preservation, spoilage, and poisoning. Prerequisite: Bact. 10 or 70. Two lectures. (2W) Taught alternate years. Not taught 1954-55. **Stevens**

**131. Clinical Laboratory Methods.** Prerequisite: Bact. 71. (4S) **James**

**133, 134, 135. Applied Medical Technology.** Practical work in hospital laboratories under close supervision.

Clinical Bacteriology and Serology 2 months **Carlquist; Clark**

Clinical Biochemistry 3 months **Carlquist; Clark**

Clinical Hematology 1 month **Carlquist; Clark**

Pathological Tissue Methods 2 months **Carlquist; Clark**

Blood Bank Procedures 2 months **Carlquist; Clark**

Electrocardiograph and Basal Metabolism Procedures (131F, W, S) **Carlquist; Clark**

**136. General Pathology Discussions.** (2F) **Carlquist; Clark**

**137. Clinical Laboratory Methods Discussion.** (2W) **Clark**

**138. Blood Bank and Blood Serology Techniques.** (1S) **Clark**

**139. Pathological Conference.** (1S) **Carlquist; Clark**

**160. Pathogenic Bacteriology.** Properties of pathogens and relationships to infectious diseases. Prerequisite: Bact. 71. Three lectures, two labs. (5F) **James**

**161. Advanced Pathogenic Microbiology.** Common pathogenic molds, yeasts, and viruses. Prerequisite: Bact. 160. Four lectures, one lab. (5S) Taught alternate years. **Staff**

**168. Immunology.** Prerequisite: Bact. 160. Three lectures, two labs. (5W) **James**

**172, 173. Bacteriology Laboratory Methods.** (2W, 2S) **Smith; Jones; James**

**180. Physiology of Bacteria.** Cellular chemistry and physiology. Prerequisite: Bact. 10 or 70, Organic Chemistry. Four lectures. (4W) **Jones**

190. **History of Bacteriology.** (2S) Not taught 1954-55. **Smith; Stevens**
291. **Seminar...** (1F, W, S) **Staff**
294. **Special Problems in Bacteriology.** Special assignments, reports, and discussions. Preparation of a comprehensive and critical review. Time and credit arranged. **Staff**
299. **Thesis Research.** Time and credit arranged. **Staff**

### Public Health

Public Health courses do not satisfy biological science group requirements.

15. **Personal Health.** Health problems of college students; especially designed for freshmen and sophomores. Two lectures. (2F, W, S)

**Members of Cache Valley Medical Association**

50. **Elementary Public Health.** Communicable and non-communicable diseases of general community significance. No prerequisites. Three lectures. (3F) **Jones**

151. **Public and School Health Administration.** Administration, organization and functions of health agencies. Prerequisite: P. H. 50. (3W) **Jones**

- 152-153. **Environmental Sanitation.** Biological background; control of air, insect, water, rodent, refuse, and food-transmitted diseases; housing, camping, and school sanitation. Two lectures per quarter. (2W, S) **Jones**

155. **School Health.** Health training for state certification requirements in health education. Three lectures. (3F, W, S, Su) **Smith; Stevens; James**

156. **School Health Methods.** Objectives, methods, curricula, and materials. Prerequisite: P. H. 155. Three lectures. (3W, S, Su) **Stevens; James**

159. **Public Health Laboratory Methods.** Experience in the practices of the Public Health Laboratory. (3 to 15 hours credit. Arranged) **Fraser**

254. **Special Problems in Public Health.** Assignments, reports, discussions. Preparation of a comprehensive and critical review. (Time and credit arranged.) **Staff**

### Botany and Plant Pathology

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

....., Professor and Head of Department; **W. S. Boyle, George W. Cochran, Ralph W. Ames**, Associate Professors; **Arthur H. Holmgren**, Associate Professor and Curator of the Intermountain Herbarium; **Richard J. Shaw**,<sup>\*</sup> Instructor; **Orson S. Cannon, Bryce N. Wadley, George Kaloostian, Leonard L. Jansen**, and **Eugene H. Cronin**, Collaborators, U. S. Department of Agriculture.  
**B. L. Richards**, Professor Emeritus.

#### Bachelor of Science Degree in Botany

Course requirements for a major: 24, 25, 30, 116, 117, 120, 130, 150, 240, 241, 242.

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 118.

<sup>\*</sup>On leave

### Master of Science Degree in Botany

The Department of Botany offers opportunity for research and graduate study leading to the Master of Science degree in the following specialized fields: Pathology, taxonomy, physiology and cytology. The research and graduate possibilities in these subjects 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, 150, 151.

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

**20. Common Plants of Utah.** Plants characteristic of Utah valley and canyons. Wherever possible, plants are studied in native habitats. Designed to aid teachers in grade and secondary schools. (5 Su) **Holmgren**

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

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

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

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

**108. Agrostology.** A taxonomic study of native and imported grasses of the western ranges. Special attention to species important in grazing and soil binding. Assumes a knowledge of fundamental principles of botany. (4W) **Holmgren**

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

**116. Microtechnique.** Principles and methods in the preparation of plant materials for microscopic study; theory and use of the microscope. Assumes a knowledge of fundamental principles of botany. (4W) Taught alternate years. **Boyle**

**117. Anatomy.** Structure and development of major cell types and tissues; comparative anatomy of the stem, root, and leaf of seed-bearing plants. Assumes a knowledge of fundamental principles of botany. (4S) Taught alternate years. Not taught 1954-55. **Boyle**

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

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

**121. Water Relations of 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) **Staff**

**130. Principles of Plant Pathology.** Fundamental principles underlying disease in plants. The types of disease and methods of study give the student a comprehensive view of plant pathology. Assumes a knowledge of botany fundamentals. (5F or S) **Ames**

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

**135. General Virology.** Bioolgy, physical and chemical properties of viruses. Prerequisites: Bot. 130 or Bact. 160 (3W) Taught alternate years. **Cochran, Jones**

**140. Forest Pathology.** Nature, cause and control of diseases affecting forest trees. Factors inducing loss in forest products are emphasized. Prerequisites: Bot. 24, 25. (4W) Taught alternate years. **Ames**

**150. Mycology.** Comparative morphology and nuclear behavior of the fungi. A summary of the field with special attention given forms important in agriculture, medicine, and industry. Prerequisite: Bot. 25. (5W) Taught alternate years. Not given in 1954-55. **Ames**

**221, 222, 223. Pathological Techniques.** Special methods applied to plant pathology, physiology, and related subjects. Registration only by special permission. (2F, W, S) Taught alternate years. Not given in 1954-55 **Staff**

**224. Advanced Plant Physiology.** Chemical reactions and transformations underlying the vital processes in plants. Prerequisite: Bot. 120. (3S) **Staff**

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

**240, 241, 242. 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**

## Dairy Industry

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

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

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

**1. General Dairy Husbandry.** Considers history and present status of the dairy industry; starting dairy herds; breeds of dairy cattle; cow testing associations; club work; study of herd records; calf feeding; general principles of feeding. (3F, W or S) **Caine**

**3. Principles of Dairy Industry.** History and development of the dairy industry; composition and secretion of milk; use and operation of the separator and Babcock test; dairy arithmetic; and a brief preview of market milk, butter, cheese, and ice cream (3W) **Larsen**

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

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

**7. Dairy Practice.** For special or short course students only. Practice in plant manufacture emphasized. Any quarter. Time and credit arranged. **Larsen**

**12. Breeds of Dairy Cattle.** History and development of all breeds of dairy cattle; emphasis on the various families within breeds requirements for official testing; pedigree and herd book study. (3F) **Caine**

**101. Manufacture of Ice Cream and Ices.** Purchase of raw materials. Chemical and physical structure of an ice cream mix and its relation to the finished product. Standardizing, processing, and freezing of standard commercial ice creams, sherbets, and ices. Merchandising and selling included. (5S) **Morris**

**102. Manufacture of Butter.** Receiving and grading of milk and cream. Neutralization and pasteurization of cream. Manufacture, packing, and grading of butter under commercial conditions. Quality and composition control are emphasized. (5S) Taught alternate years. **Larsen**

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

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

**105. Management and Operation of Dairy Manufacturing Plants.** Personnel problems, advertising, selling, managerial use of records, and other principles underlying successful management and operation are considered. All operations of the creamery are conducted by this class. Application for admittance must be made in writing. (6F, W or S) **Morris; Larsen**

**109. Dairy Production.** A brief review of the dairy industry. The place of dairying in a permanent system of agriculture. Study of dairy type, brief review of breeds of dairy cattle. Factors to consider in selecting a breed. Selection of cows; system of record keeping; selection, care and management of the herd sire. (3W) **Caine**

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

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

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

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

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

**215. Seminar.** Discussion and reports of current literature. Any quarter. Time arranged. **Larsen; Hunsaker**

**216. Graduate Research in Dairy Production.** Any quarter. Time and credit arranged. **Stoddart**

**217. Graduate Research in Dairy Manufacturing.** Any quarter. Time and credit arranged. **Morris**

**254. Special Problems in Dairy Production.** Any quarter. Time and credit arranged. **Larsen; Hunsaker**



### General Course in Dairy Production

Designed for students majoring in dairy production to prepare them for the management and operation of dairy farms and herds, and to become county agents or vocational agriculture teachers.

Freshman	Cr.
Math. 34 or 35 .....	3-5
Chemistry 10, 11, 12, or 3, 4, 5 & 12 .....	15
Dairy 1 .....	3
An. Hus. 1 .....	3
Poultry 1 .....	3
Veg. Crops 1 or Hort. 1 .....	3
Agron. 6 & 7 or 8 .....	4
Sociology 10 or 70, or Political Science 10 .....	5
Speech 1 .....	5
Dairy 3 .....	3
	46-48

Sophomore	Cr.
Agr. Econ. 53 .....	5
Vet. Science 20 .....	5
Bact. 10, or 70 & 71 .....	5
Botany 24 .....	5
Zoology 2 .....	5
English 10 .....	5
Agronomy 56 .....	4
Dairy 6, 12 .....	8
An. Hus. 10 .....	5
	47

Junior & Senior	Cr.
An. Hus. 155 .....	5
Dairy 109 .....	3
Dairy 110 .....	5
Dairy 111 .....	2
Dairy 112 .....	3
Dairy 115 .....	1
Dairy 120 .....	3
Ent. 108 .....	5
Chemistry 107 .....	4
Bact. 104 .....	3
Vet. Sci. 120 .....	4
Agr. Econ. 58 & 63 .....	6
Library Science 106 .....	1
English 110 .....	4
Pol. Sci. 102 .....	3
Electives .....	3
	85

### General Course in Dairy Manufacturing

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

Freshman	Cr.
Math. 34 .....	3
Zool. 1 or Botany 24 .....	5
Language and Arts .....	8
Agr. Econ. 53 .....	5
Physiology 4 .....	5
Social Science .....	8
P. E. or Military .....	3
Electives .....	8
Applied Plant Science .....	6
	49

Sophomore	Cr.
Bacteriology 70 & 71 .....	5
Chemistry 10, 11 & 12 .....	15
Dairy 6 .....	5
Speech 5 .....	3
English 10 .....	5
Dairy 5 .....	2
Electives .....	6
P. E. or Military .....	3
Applied Animal Science .....	6
	50

Junior	Cr.
Dairy 103 .....	5
Chemistry 107 & 108 .....	8
Business Adm. 25 .....	5
Agr. Econ. 15 or 120 .....	3
Dairy 104 .....	5
English 110 .....	4
Agr. Econ. 63 .....	3
Dairy 101 .....	5
Bacteriology 104-105 .....	5
Electives .....	2
Ag. Eng. 4 .....	4
	49

Senior	Cr.
Dairy 115 .....	2
Dairy 254 .....	6
Library Science 106 .....	1
Dairy 105 .....	6
Dairy 102 .....	5
Dairy 110 or equivalent .....	5
Electives .....	25
	50

Suggested electives: Business Administration 63 and 156; Sociology 70; Dairy 112.



### Technical Course in Dairy Manufacturing

This course is designed to meet the needs of laboratory technicians, investigators, teachers, and those who expect to enter graduate study.

<b>Freshman</b>		<b>Cr.</b>	<b>Junior</b>		<b>Cr.</b>
Math. 35 and 44 .....		8	Dairy 115 .....		1
Zool. 1 or Botany 24 .....		5	Chemistry 121 & 122 .....		10
Language & Arts .....		5	Agr. Econ. 115, or 63 or 120 .....		3
Physiology 4 .....		5	English 110 .....		4
Agr. Econ. 53 .....		5	Social Science .....		10
P. E. or Military .....		3	Dairy 101 .....		5
Electives .....		11	Bacteriology 104-105 .....		5
Applied Animal Science .....		3	Electives .....		5
Applied Plant Science .....		6	Ag. Eng. 4 .....		4
		<hr/> 51			<hr/> 47
<b>Sophomore</b>		<b>Cr.</b>	<b>Senior</b>		<b>Cr.</b>
Bacteriology 70 & 71 .....		5	Chemistry 107-108 .....		8
Chemistry 3, 4, 5 .....		15	Library Science 106 .....		1
Dairy 6 .....		5	Dairy 102 .....		5
Speech 5 .....		3	Dairy 104 .....		5
Physics 6 .....		5	Dairy 105 .....		6
English 10 .....		5	Dairy 110 or equivalent .....		5
Dairy 5 .....		2	Electives .....		15
Electives .....		5			<hr/> 45
P. E. or Military .....		3			
		<hr/> 48			

Recommended electives: Business Administration 63 and 156; Physics 7; Dairy 115 and 154; English 5; Chemistry 117 and 118.

## Horticulture

**Leonard H. Pollard**, Professor and Head of Department; **E. Milton Andersen**, Associate Professor and Extension Vegetable Specialist; **J. Clark Ballard**, **Robert K. Gerber**, and **Robert A. Norton**, Assistant Professors; **Gene Oberly**, Assistant Professor and Extension Fruit Specialist; **Otto Riethman**, Instructor; **Odeal Kirk**, Superintendent, Howell Field Station; \_\_\_\_\_, Superintendent, Farmington Field Station; **Leslie R. Hawthorn**, Collaborator in Research, U. S. D. A.

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

### Master of Science Degree

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

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

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

**Lower Division Courses in Horticulture**

<b>Freshman</b>		<b>Cr.</b>	<b>Sophomore</b>		<b>Cr.</b>
Math. 34 or 35 .....		3-5	Chem. 10, 11, 12, or 3, 4, 5.....		15
P. E. or M. S. & T. ....		3	Speech 1 or 5 .....		5-3
Botany 24 & 25 .....		10	Eng. 10 .....		5
Agr. Econ. 53 .....		5	Agron. 56 .....		5
Hort. 1 .....		3	Animal Science .....		0-3
Hort. 2 .....		1	Landscape Arch. ....		3
Hort. 4 .....		3	P. E. or M. S. & T. ....		3
Hort. 5 .....		1	Hort. 10 or 11 .....		4 or 3
Animal Science .....		3-6	Hort. 6 .....		3
Social Science .....		5	Social Science .....		3
Bact. 10 or 70 & 71 .....		5	Ag. Econ. 58 & 63 .....		6
Botany 30 .....		5			
					52-55
		50-52			

**Suggested Courses for Students in General Horticulture**

<b>Junior</b>		<b>Cr.</b>	<b>Senior</b>		<b>Cr.</b>
Hort. 108 .....		3	Hort. 105 or 151 .....		4
Hort. 101, 102 .....		8	Hort. 152 .....		4
Ent. 108 .....		5	Hort. 153 .....		3
Botany 120 .....		5	Hort. 107 .....		4
Zoology 112 .....		5	Hort. 124 .....		4
English 110 .....		4	Hort. 115 .....		4
Botany 130 .....		5	Electives .....		28
Entomology 120 .....		2			
Electives .....		14			51
		51			

**Suggested Course for Students Specializing in Floriculture**

<b>Junior</b>		<b>Cr.</b>	<b>Senior</b>		<b>Cr.</b>
Hort. 116 .....		3	Hort. 119 .....		3
Entomology 108 .....		5	Hort. 120 .....		3
Hort. 118 .....		3	Hort. 153 .....		3
Botany 120 .....		5	Hort. 130 .....		4
Hort. 117 .....		3	Chem. 125, 126 .....		10
Zoology 112 .....		5	Hort. 115 .....		4
Botany 130 .....		5	Electives .....		24
Entomology 120 .....		2			51
English 110 .....		4			
Landscape Arch. 40 .....		3			
Landscape Arch. 41 .....		3			
Electives .....		10			
		51			

**Suggested Course for Students Specializing in Vegetable Crops**

<b>Junior</b>		<b>Cr.</b>	<b>Senior</b>		<b>Cr.</b>
Agron. 107 .....		5	Agronomy 109 .....		4
Zoology 112 .....		5	Agronomy 131 & 132 .....		6
Eng. 110 .....		4	Agronomy 155 .....		3
Hort. 130 .....		4	Hort. 124 .....		4
Hort. 105 .....		4	Hort. 121 .....		4
Hort. 10 .....		4	Hort. 153 .....		3
Hort. 108 .....		3	Botany 121 .....		3
Botany 120 .....		5	Botany 130 .....		5
Electives .....		17	Entomology 108 .....		5
		51	Electives .....		10
					51

**Suggested Course for Students Specializing in Pomology**

Junior	Cr.	Senior	Cr.
Hort. 108 .....	3	Hort. 152 .....	4
Entomology 108 .....	5	Hort. 151 .....	4
Hort. 101, 102 .....	8	Hort. 153 .....	3
Botany 120 .....	5	Chem. 125 & 126 .....	10
Zoology 112 .....	5	Hort. 107 .....	4
Botany 130 .....	5	Hort. 105 or 124 .....	4
English 110 .....	4	Hort. 115 .....	4
Entomology 120 .....	2	Electives .....	18
Electives .....	14		
	<hr/> 51		<hr/> 51

**1. Elementary Pomology.** Principles and practices underlying production of tree fruits. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage, propagation, and stocks. (3F, W) **Norton**

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

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

**5. Vegetable Production Laboratory.** Gives practical experience in vegetable production. Field trips are taken to important production areas and vegetable processing plants. (1F or S) **Pollard; Ballard**

**6. Plant Propagation.** Principles and practices involved in propagation of horticultural plants. (3S) **Gerber; Riethman**

**10. Principles and Practices of Floriculture.** Fundamentals involved in the culture of annual and perennial flowers, bulbs, house plants, shade trees, shrubs, lawn grasses and greenhouse plants. (4W) **Riethman**

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

**101, 102. Advanced Pomology.** Principles and practices of orcharding; 101, water relations, nutrition, light, growth regulators; 102, temperature, pruning fruit setting. Prerequisite: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 and 2 and Hort. 6. (4F, 4W) Taught alternate years. (Not given 1954-55.)

**107. Horticultural Sprays and Spray Practices.** Design, operation, care of spray equipment and machinery. Preparation, properties, use of sprays in fruit thinning, prevention of preharvest drop, fruit coloring and maturity, nutrition, pest control. Chemical, physical and physiological considerations necessary with these sprays. Use of plant growth regulators. One laboratory period per week. Prerequisites: Chem. 4 or 11; Bot. 130; and Zool. 108. (4W) Taught alternate years. (3S) **Staff**

**108. Small Fruit Production.** The culture of small fruit in home and commercial plantings. Prerequisite: Hort. 1 (3W) **Gerber**

**115. Fruit and Flower Breeding.** Fundamental principles and practices of plant breeding in the improvement of fruit and ornamental plants. Prerequisites: Zool. 112; Hort. 1 and preferably 6, 10, and 108. (4S) Taught in alternate years. (Not given 1954-55.) **Norton**

**116, 117. Commercial Greenhouse Management.** Principles and practices of commercial greenhouse management. Prerequisites: Hort. 1, 6, 10; Bot. 24, 25. (3F, 3W) Taught in alternate years. (Not given 1954-55.) **Riethman**

**118. Floral Design.** Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. (3F) Taught in alternate years. (Not given 1954-55.) **Staff**

**119, 120. Systematic Floriculture.** 119. Systematic study of garden flowers. Prerequisites: Hort. 1, 6, 10; Bot. 30, 120. Systematic study of plants grown by

**121. Advanced Vegetable Crops.** Economic, ecological and physiological factors underlying vegetable production, based on study of experimental results. Prerequisites: Hort. 4; Agron. 56, Bot. 120. (4W) Taught in alternate years. (Not given 1954-55.) **Ballard**

**124. Vegetable Breeding.** Principles and practices of plant breeding in the improvement of vegetables. Prerequisite: Agron. 109. (4S) Taught alternate years. **Pollard; Ballard**

**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 seed producing areas in southern Idaho. (4F) Taught in alternate years. **Pollard; Hawthorn**

**151. Systematic Pomology.** Systematic study of fruits, origin, classification, identification, judging, adaptation. (4F) Taught alternate years. **Staff**

**152. Fruit Handling.** Problems in handling and marketing; picking, grading, packing, transportation, storage, distribution, buildings, equipment, roadside and local marketing, processing. One laboratory period per week. Prerequisite: Hort. 1. (4F) Taught alternate years. (Not given 1954-55.) **Staff**

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

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

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

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

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

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

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

## **Landscape Architecture and Planning**

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

**Laval S. Morris**, Professor and Head of Department; **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.

### Courses Required to Graduate in the Department of Landscape Architecture and Planning

The following courses are intended to provide: (1) necessary instructional material directly concerned with Landscape Architecture and Planning. (2) Supporting courses listed in fields which are closely related, such as Civil Engineering, Art, Horticulture, and Botany. (3) Courses required in the various fields of Science and Art for liberal education. These courses are required by students regardless of the department in which they graduate.

Freshman		Cr.	Sophomore		Cr.
Elem. of Landscape Arch.			Plant Materials, 40, 41 .....		6
L. A. 3 .....		3	Architectural Design,		
Drawing, L. A. 20 .....		3	60, 61, 62 .....		6
History and Lit. of Landscape			Mechanics and Molecular		
Architecture, L. A. 20 .....		5	Physics, 6 .....		5
Theory of Design, L. A. 35 .....		3	Descriptive Geometry,		
Algebra, Math. 34, 35 .....		8	C. E. 63 .....		3
Trigonometry, Math. 46 .....		5	Plane Surveying		
General Botany, Botany 24, 30 .....		10	Civil Eng. 81, 82 .....		6
Inorganic Chemistry			Mechanical Drawing 94 .....		3
Chemistry 1 or 10 .....		5	Soph. Comp., Engl. 10 .....		5
Mechanics of Writing, Engl. 2 .....		3	Sociology 70 .....		5
Elem. Design and Form Study,			Soils Agronomy 56 .....		4
Art 1 .....		3	Plant Propagation, Hort. 6 .....		3
Electives .....		2	Electives .....		4
		<hr/> 50			<hr/> 50
Junior		Cr.	Senior		Cr.
Design, L. A. 140, 141, 142 .....		6	Planting Design, L. A. 151, 152 .....		6
Landscape Constr. 160, 161, 162 ....		9	Advanced Planning and		
Planting Design, L. A. 150 .....		2	Design, L. A. 180, 181, 182 .....		9
Recreational Planning, L. A. 130 ....		2	City Planning, L. A. 170 .....		3
Fundamentals of Speech 1 .....		5	Creative Expression, Art 4 or 104 ....		3
Creative Expression, Art 104 .....		3	Landscape Architecture 190 .....		6
Adv. Comp., Engl. 110 .....		5	The Writing of Feature		
Economics 51, or Ag. 53, 58 .....		5	Articles, Journalism 112 .....		3
Principles of Eugenics, Zool. 111 ....		4	Roads and Pavements		
Geology 3 .....		5	Civil Engineering 120 .....		4
Electives .....		4	Electives .....		16
		<hr/> 50			<hr/> 50

Students in the School of Agriculture take those Agricultural subjects listed in the college catalog as necessary requirements.

**3. Elements of Landscape Architecture and Planning.** Relation of people to land regions and small areas. Principles of design and composition applied to various types of land planning. Design of home grounds is emphasized. Field trip required. (3F or S) Morris; Shiozawa

**20. Drawing.** A general course to acquaint students with use of instruments. Necessary to all design courses. Lettering, general drafting, perspective drawing, light and shade studies. (3F or W) Shiozawa

**30. History and Literature of Landscape Architecture.** The history of landscape architecture and its relation to architecture and other allied arts. Present trends and future possibilities are emphasized. (5W) Morris

**35. Theory of Design.** A study of form in relation to vertical mass and horizontal space. Abstract design is studied and the resultant forms transposed into concrete space and mass relationships. The chief purpose is to provide the student with an awareness of design as early in his training as possible. (3W) Staff



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

**60, 61, 62. Architectural Design.** Study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. (2F, W, S) **Staff**

**130. Recreational Planning.** Public and private recreation in relation to design, construction and operation. National and state parks and forests studied as they pertain to recreation. Field trip required. (2S) **Shiozawa**

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

**140, 141, 142. Design.** Design of private and public properties based on principles of utility and composition. Prerequisites: L. A. 3, 20; and Civil Eng. 81, 82. (2F, W or S) **Shiozawa**

**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) **Morris**

**165. Construction Methods and Practice.** For students who intend to become contractors or go into maintenance work. Students work in the field on construction projects involving grading, general construction and planting. Registration by permission during summer. Credit arranged. **Staff**

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

**180, 181, 182. Advanced Planning and Design.** Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (3F, W or S) **Morris**

**190. Special Problems.** Selected problems to meet the needs of individual students for completion of training. Registration by permission only. Any quarter. Time and credit arranged. **Staff**

**195. Seminar.** Readings and discussions. (1W) **Staff**

**210. Advanced Problems in Design and Planning.** Time and credit arranged. **Staff**

## Poultry Husbandry

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

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

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

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



**Suggested Course of Study for Majors in Poultry Husbandry****Freshman**

<b>Fall</b>		<b>Winter</b>		<b>Spring</b>	
Course	Cr.	Course	Cr.	Course	Cr.
Physiol. 4 .....	5	Bact. 10 .....	5	A. H. 1 .....	3
P. H. 1 .....	3	Vet. Sci. 20 .....	5	Speech 1 .....	5
Math. 34 or 35 .....	3	Hort. 1 .....	3	Rural Soc. 10 .....	5
M. S. or P. E. ....	1	M. S. or P. E. ....	1	M. S. or P. E. ....	1
Agr. Econ. 53 .....	5	Elective .....	2	Elective .....	2
	<hr/> 17		<hr/> 16		<hr/> 16

**Sophomore**

<b>Fall</b>		<b>Winter</b>		<b>Spring</b>	
Course	Cr.	Course	Cr.	Course	Cr.
Veg. Crops .....	3	Chem. 4 or 11 .....	5	Chem. 5 or 12 .....	5
Chem. 3 or 10 .....	5	Eng. 10 .....	5	Agron. 56 .....	4
Soc. Sci. ....	3	P. H. 8 .....	3	M. S. or P. E. ....	1
Agron. 6 & 7 or 8 .....	4	M. S. or P. E. ....	1	Zool. 2 .....	5
M. S. or P. E. ....	1	Elective .....	2	L. A. 3 .....	3
	<hr/> 16		<hr/> 16		<hr/> 18

**Junior**

<b>Fall</b>		<b>Winter</b>		<b>Spring</b>	
Course	Cr.	Course	Cr.	Course	Cr.
Lib. Sci. 106 .....	1	P. H. 126 .....	1	Agr. Econ. 63 .....	3
Agr. Econ. 58 .....	3	P. H. 107 .....	4	Eng. 110 .....	4
An. Hus. 10 .....	5	Agr. Econ. 115 or		P. H. 104 .....	2
Zool. 112 .....	5	Agron. 103 .....	4	Vet. Sci. 170 or	
Elective .....	2	P. H. 105 or 106 .....	3	elec. ....	3
	<hr/> 16	Elective .....	4	Elective .....	3
			<hr/> 16		<hr/> 15

**Senior**

<b>Fall</b>		<b>Winter</b>		<b>Spring</b>	
Course	Cr.	Course	Cr.	Course	Cr.
An. Hus. 150 .....	4	P. H. 126 .....	1	P. H. 105 or 106 .....	3
Physiol. 121 .....	5	P. H. 125 .....	2	Agr. Engr. 105 .....	5
Entom. 108 .....	5	D. H. 109 .....	3	Elective .....	9
Elective .....	2	Agr. Econ. 115 .....	3		
	<hr/> 16	Elective .....	7		<hr/> 17
			<hr/> 16		

**Suggested Electives:** Irr. and Dr. 10; Vet. Sci. 140; An. Hus. 150, 151, 155; Agron. 131, 132; Chemistry 125, 126, 190; English 5, 111.

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

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

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

**10. Poultry Practice.** Elementary practice at the poultry yards. Prerequisite: Poultry 1. (1F, W or S) **Staff**

**104. Incubation and Brooding.** Problems involved in incubation or hatchery operation, and the brooding, feeding, and rearing of chicks. Advantages and disadvantages of battery, hot water, electric, coal burning, and gas brooders are emphasized. (2S) **Drapers**

**105. Poultry Management.** Problems of location of poultry farm, farm planning, renewing the flock, feeding, disease control, marketing, and problems affecting labor income are studied in detail. Prerequisite: Poultry 1 (3W) Taught alternate years. (Taught 1954-55.) **Carson**

**106. Poultry Breeding.** Discussed from the standpoint of populations rather than individuals. Consideration is given to selection pressure, relationships, inbreeding, heritability, expected gains, mating systems, and selection indexes. Prerequisites: Poul. 1 or 101; Math. 34, and Zool. 112. (3W) Taught alternate years. (Taught 1954-55.) **Carson**

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

**125. Special Problems.** Selected problems to meet student needs. Registration by permission only. Prerequisites: Poul. 1, 104 and 107. Credit arranged. (F. W or S) **Staff**

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

**Poultry Diseases.** (See Veterinary Sciences 170.)

**210. Research Problems in Poultry Nutrition.** Time and credit arranged (2-5) **Anderson**

**212. Research Problems in Poultry Breeding.** Time and credit to be arranged. (2-5) **Carson**

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

## Veterinary Science

Wayne Binns, Professor and Head of Department; M. L. Miner, Associate Professor; LeGrande Shupe, Royal Bagley, J. Alan Thomas, Assistant Professors.

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

Students desiring to study toward a degree in Veterinary Medicine (D.V.M.) must have at least two years and preferably three of pre-veterinary training at some authorized college or university, with all the basic courses completed. In many cases, because of the large number of students desiring to study veterinary medicine, it is required to have a B.S. degree before being admitted to a veterinary school. Enrollment in these schools is limited; generally, preference is given to the students from the state in which the school is located. Therefore, it is advisable to have a solid and well-rounded background. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry are eligible for entrance into all veterinary schools except those requiring additional chemistry, physics or mathematics.

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

**20. Anatomy and Physiology of Domestic Animals.** A study of how the animal's body is constructed and its functions. Each system is studied separately; emphasis on the digestive and reproductive system. 4 lectures, 1 lab. (5F or W) **Shupe**

**120. Animal Hygiene.** Principles of animal sanitation in relation to disease control. Federal and state disease control programs and the etiology, symptoms, and control measures of the more prevalent diseases are also studied with demonstrations of first aid, and the common farm operations on animals. 3 lectures, 1 lab. (4S) **Shupe**

**140. Veterinary Parasitology.** Detailed study of the scientific name, common name, class, range, pathogenesis, life cycle, methods of control and treatment of common internal and external parasites of domestic animals. 4 lectures, 1 lab. (5F) **Binns**

**170. Poultry Hygiene.** Principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of common diseases affecting poultry in this region. Taught alternate years. 2 lectures, 1 lab. (3S) **Binns**

**200. Special Problems.** Open to upper division or graduate students majoring in some subject related to Veterinary Medicine and who wish to study some particular phase of disease in animals. Any quarter. Time arranged. Credit 1 to 3. **Staff**

**210. Research.** Outlining and conducting research on animal diseases. Any quarter. Time and credit arranged. **Staff**

### Suggested Pre-Veterinary Courses

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

\*Zoology 3, 4, 118; \*Chemistry 3, 4, 5, or 10, 11, 5; \*Organic Chemistry 121, 122, or 125, 126; \*Physics 20, 21, 22, or 6, 7; \*Mathematics 34, 35, and 44, or 46; \*Botany 25, 104; Animal Husbandry 1, 10, 150; Poultry 1, 2; Dairy 1; and \*English 10, 110.

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

## Zoology

### Zoology, Entomology, and Physiology

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

D. M. Hammond, Professor and Head of Department; G. F. Knowlton, Clyde Biddulph, Eldon J. Gardner, William F. Sigler, Professors; J. Sedley Stanford, C. H. Kelker, Thomas L. Bahler, Donald W. Davis, Associate Professors; Merrill Gunnell, Assistant Professor; Gene H. Linford, Instructor; Howard E. Dorst, F. V. Lieberman, G. E. Bohart, H. F. Thornley, George H. Kaloostian, Marshal Levin, William P. Nye, Collaborators in Research, U. S. D. A.; Paul R. Fitzgerald, Parasitologist, U. S. D. A. Bureau Animal Industry.

C. J. Sorenson, Professor Emeritus.

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

Requirements for a major in Agricultural Entomology:

Zoology 3 Invertebrate Zoology	108 Agricultural Entomology
4 Vertebrate Zoology	115 Medical and Veterinary Entomology
112 Principles of Genetics	120 Insect Pollination in Relation to Agriculture
Entomology 13. General Entomology	156 Chemistry of Insecticides and Fungicides
101 Insect Morphology	
111 Insect Anatomy and Physiology	
102, 103 Systematic Entomology	

See "Zoology" under School of Arts and Sciences, for course descriptions.

## SCHOOL OF ARTS AND SCIENCES

CARLTON CULMSEE, DEAN

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## General Information

Besides training students for studies in the technical divisions of the Institution, the School of Arts and Sciences offers opportunity to all students in the College to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never been so urgent as now. Such understanding is the surest path to permanent peace. Many courses in 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 students to major in its departments and thus begin preparation for their careers.

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

### TWO-YEAR PROGRAM IN GENERAL EDUCATION

Students may earn the title of "Associate in Arts" or "Associate in Sciences" and a two-year diploma by completion of a program in basic education. It is believed that the prescribed studies will be very helpful to any student, whether he completes only two years of college or whether he continues until he receives a B.S. degree. Although the total number of credit hours required in this program is larger than that required for the completion of the "group requirements" now current, the student may also specialize to some extent in these first two years of college.

The courses, which are drawn from the offerings of the Schools of Arts and Sciences, Commerce, and Education, are as follows:

#### Physical Science

Physical Science 31, 32, 33. Central Principles .....3-3-3 credits

#### Biological Science

Biology 1. Principles of Biology .....5  
Physiology 4 or lower division Bacteriology .....5

#### Heritage of Civilization

History 4. Ancient World Civilizations .....5  
History 5. Modern World Civilizations .....5

#### Citizenship

History 13 or 14. U. S. History .....5  
Pol. Sci. 1. Government and the Individual .....5  
(or)  
Pol. Sci. 10. American National Government .....5

#### Communication

Speech 1. Speech Fundamentals .....5  
English 10. Written Composition (Sophomore Composition) .....5



### Humanities

English 40. World Literature .....	5
English 60. English Literature .....	5
English 53. American Literature .....	5
(or)	
One year of a foreign language .....	14 or 15 credits
(or)	
Art. 3. Art Understanding and Appreciation .....	3
Art. 26. History and Appreciation of Architecture .....	3
Art. 36. Development of Modern Art .....	3
(or)	
Music 1. The Art of Listening .....	3
(or)	
Music 90. Music in General Culture .....	3

Men should also register for Basic Military or Air Science each quarter, and women for a Physical Education activity course each quarter.

Advisers would do well to help students choose classes in health, family living, diet and nutrition, economics and financial planning, and other courses of high functional value in today's living.

## GENERAL STUDIES

### Biology

**Administered by the staffs of the Departments of Bacteriology and Public Health, Botany and Plant Pathology, and Zoology**

1. **Principles of Biology.** Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environment, kinds of living things, reproduction, development, inheritance, and evolution. Five lectures. (5F, W, S, or Su) Staff

### Physical Science

**Administered by the staffs of the Departments of Chemistry, Geology, and Physics**

31, 32, 33. **Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, and physics integrated for use in interpreting human experiences. Intended to meet the physical science group requirements upon completion of all three quarters. (3F, 3W, 3S) Staff

### Humanities

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

V. Nielsen; Hansen

(In addition, it is recommended that the student complete at least one of the following: English 45—Philosophical Literature; English 53—American Literature. Also it is recommended that the student complete one of the following: Art 3, 26, 36; Music 1, 90.)

Two years of a foreign language are also recommended as an option for satisfaction of the Language and Arts, or Humanities, group requirement.)

## Social Sciences

**History 4. Ancient World Civilizations.** An integrated course in the cultural heritage of the world from earliest times to the sixteenth century. The Near and Far eastern civilizations with emphasis on the European heritage: Greece, Rome, Christianity, the Middle Ages, Renaissance and Reformation. (5F or S) Ellsworth

**History 5. Modern World Civilization.** The cultural heritage of the world from the sixteenth century to the present. Emphasis on European civilization and its spread in the world—the Americas, the Near and Far East. (5W) Ellsworth

(Political Science 1—Government and the Individual, and History 13, 14—United States History, are also recommended.)

Students are encouraged to broaden their liberal education with other courses in basic sciences and humanities, landscape architecture, political science, economics, and sociology.

## PRE-MEDICAL TRAINING

The School of Arts and Sciences offers the necessary courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

### Suggested Pre-Medical Schedule

Freshman				Sophomore			
	F	W	S		F	W	S
Zoology 3, 4 .....	5	5	---	German, French or			
Chem. 3, 4, 5 .....	5	5	5	Latin .....	5	5	5
Math. 34, 35, 44 or 46 .....	3	5	3	English 10 .....	---	5	---
English 40 or 52 .....	---	---	5	Physics 17, 18, 19 .....	5	5	5
Military Science .....	1	1	1	Electives .....	7	2	7
Electives .....	3	1	3				
Total .....	15	17	17	Total .....	17	17	17

### Junior

	F	W	S
Chem. 121, 122 or 125, 126 .....	5	5	---
Zoology 112 .....	5	---	---
Zoology 118 .....	---	5	---
English 110 .....	---	---	4
Chem. 115 .....	---	---	5
Electives .....	7	7	8
Total .....	17	17	17

Recommended electives are Scientific Vocabulary (Eng. 5), Psychology, College Grammar, Technical Writing, History, Political Science, Sociology, Economics, Philosophical Literature or other literature classes. Some medical schools require and a number recommended Comparative Anatomy.

Pre-medical students interested in graduation from this College before attending medical school may major in any subject in which they are interested.

Students interested in a pre-osteopathic program should consult the pre-medical adviser.

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

**MEDICAL TECHNOLOGY**

The School of Arts and Science offers the necessary courses to satisfy the entrance requirements for Medical Technology internships in the United States, Canada, and Hawaii. A two-year course is required to complete minimal requirements. However, the college provides a three-year course which combined with the internship qualifies a student for the B.S. degree. For this degree program the college has affiliations with the L. D. S. Hospital in Salt Lake City, St. Benedict's Hospital in Ogden, and Thomas Dee Memorial Hospital in Ogden. At the satisfactory completion of the internship, the student is qualified to take the registration examination given by the Registry of Medical Technologists of the American Society of Clinical Pathologists.

For further details contact Garth A. James in the Department of Bacteriology and Public Health.

**PRE-DENTAL TRAINING**

Students planning to enter the profession of dentistry may take the necessary courses in the School of Arts and Sciences to satisfy requirements for admission to any schools of dentistry in the United States.

**Suggested Pre-Dental Schedule**

<b>Freshman</b>			
	F	W	S
Chemistry 3, 4 5 .....	5	5	5
Zoology 3, 4 .....	5	5	---
Mathematics 34, 35, 44 .....	3	5	3
English 40 or 52 .....	---	---	5
Military Science 1, 2, 3 or P. E. ....	1	1	1
Electives (optional) .....	3	1	3
Total.....	17	17	17
<b>Sophomore</b>			
	F	W	S
Physics 17, 18, 19 .....	5	5	5
Military Science 4, 5, 6, or P. E. ....	1	1	1
Electives (optional) .....	6	12	12
Total.....	12	18	18
<b>Junior*</b>			
	F	W	S
Chemistry 125, 126 .....	5	5	---
Zoology 118 or 119 .....	---	5	or 5
English 110 .....	4	---	---
Electives .....	8	7	12
Total.....	17	17	17

\*Students with unusually good records may sometimes be accepted after two years of pre-dental work. In this case the required courses included in the three-year program listed above must be completed in two years.

Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.

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

**B. S. IN NURSING**

Persons who have Registered Nurse credentials may pursue studies toward their bachelor of science degree. Credits earned toward the R. N. are applied toward the B. S. as evaluated by the Registrar. Such students may be graduated with a major in Nursing or they may elect to complete their college work in some such field as Public Health or Bacteriology.

**Philosophical Literature**

Most of the courses listed below have been cross-referenced from other departments. The major part of their content is philosophical. They are assembled here for the convenience of students interested in the interpretations which philosophers have made of man and his place in the universe. They afford opportunities for both teacher and student to apply philosophical principles to the solution of problems in various fields of human thought and action.

The philosophical content in many other courses in History, Political Science, and Literature is rich. Such courses as Ancient World Civilizations and Modern World Civilizations (History 4 and 5) are invaluable to one wishing to understand the development of human thought.

It is recommended that students take advantage of the instruction in religious philosophy offered by the churches of Logan. Of such work, those courses classed as non-secular yield college credit.

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

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

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

**107. History of Biology.** The more important men and ideas in the historical development of biology. (4F) Zoology 107. **Gardner**

**117, 118, 119. American Political Thought.** The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, modes of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Students may register for one, two or three quarters. (2F, 2W, 2S) Political Science 117, 118, 119. **Staff**

**131. Organic Evolution.** Critical study of the facts of evolution as obtained from consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: Zoology 1 or 2, or 3 and 4. 111 and 112 recommended. (3W) **Gardner**

**134. Literary Criticism.** Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4S) English 134. **Edwards**

**145, 146. History of Political Thought.** No. 145 covers political theories and ideas from the Greek period to Martin Luther. No. 146 continues the study of political theories from Luther to 18th Century. Students may take either or both quarters. (3F, 3W) Political Science 145, 146. **Staff**

**150. Recent Political Thought.** Political ideas and writers from the close of the 18th Century to the present with emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3S) Political Science 150. **Staff**

**155. Emerson.** Detailed analysis of his poetry and essays; consideration of his relationship to other major writers in this period. (2) English 155. **Smith**

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

## Bacteriology and Public Health

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

**W. Whitney Smith**, Professor and Head of Department; **Kenneth R. Stevens**, Professor; **Lewis W. Jones**, Associate Professor; **Garth A. James**, Instructor; **John H. Carlquist**, Special Professor; **Homer Clark**, Special Associate Professor; **Russell S. Fraser**, Special Assistant Professor. Special staff members from the Cache Valley Medical Association.

### Bachelor of Science Degree

General Bacteriology majors should take: Bact. 70, 71, 101, 104-105 or 120, or 110, 131, 160, 168, 172, 173, 180, 291; Chemistry 3, 4, 5, 6, 117, 118, 125, 126, 191; Mathematics 35, 44; Physics 17, 18, 19 (6 and 7 are accepted in special cases); Public Health 50; Botany 24, 25; Zoology 3, 4; Library Science 106.

Clinical (Medical Laboratory) Technology Majors should take during their first, second and third years: Bact. 70, 71, 172, 173, 101, 131, 160, 161, 168, 291. Chemistry 3, 4, 5, 12, 17, 18, 190, 192; Physiology 4; Physics 6, 7; Public Health 50; Zoology 3, 4, 116, 129; and meet all college requirements except for total credits and upper division. A hospital internship for twelve months shall be completed during the fourth year, which shall include instruction in Bact. 133, 134, 135, 136, 137, 138 and 139. Utah State Agricultural College has made provisions for instruction of laboratory technicians in this internship in the W. H. Groves L. D. S. Hospital in Salt Lake City or the Thomas Dee L. D. S. Hospital in Ogden. During this fourth year, students register for three quarters. When this program is satisfactorily completed, students are eligible for the Bachelor of Science degree in Medical Technology. The student may then also apply for certification by the Registry of Medical Technologists after completion of a qualifying examination given by the American Society of Clinical Pathologists. (Consult Professor Garth A. James for further details.)

Health Education Majors should take: Public Health 15, 50, 151, 152, 153, 156; Bacteriology 10; Physical Education 55, 84, 135, 145, 181; Foods and Nutrition 5.

Physical Education—Health Education composite majors should consult Professor H. B. Hunsaker.

Minors in Health Education should take: Public Health 15, 50, 151, 156; Physical Education 135, 145; Social Work 165; plus Electives, Physical Education 55, 84, 181; Foods and Nutrition 6; Psychology 145 or Social Work 162.

Public Health Majors should take: Public Health 50, 151, 152, 153, 155; Bacteriology 10 or 70, 71; Dairy 6, 7; Physiology 4; Zoology 3, 4, 111, 116.

### Master of Science Degree

Research and graduate courses are available in various specialized subjects, with strong support from related departments and agencies. Courses numbered 200 and above are designed for graduate students. Courses 110, 120, 131, 151, 153, 161, 168, and 180 may be used for credit by graduate majors in Bacteriology. These courses and the following—104, 105, 151, 156 and 160—may be modified and used for credit by graduate students in related departments.

See "Bacteriology and Public Health" in the School of Agriculture for course listings and other degree offerings.

## Botany and Plant Pathology

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

....., Professor and Head of Department; W. S. Boyle, George W. Cochran, Ralph W. Ames, Associate Professors; Arthur H. Holmgren, Associate Professor and Curator of the Intermountain Herbarium; Richard J. Shaw\*, Instructor; Orson S. Cannon, Bryce N. Wadley, George Kaloostian, Leonard L. Jansen, and Eugene H. Cronin, Collaborators, U. S. Department of Agriculture. B. L. Richards, Professor Emeritus.

### Bachelor of Science Degree in Botany

Courses required for a major: 24, 25, 30, 116, 117, 120, 130, 150, 240, 241, 242.

Courses required 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, 118.

### Master of Science Degree in Botany

The Department offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Pathology, Taxonomy, Physiology and Cytology. Research and graduate possibilities in these subjects are greatly augmented through 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, 151.

The following courses may be modified and used for graduate credit for students in other departments: 114, 117, 118, 120, 121, 130, 131, 135, 150, 151.

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

## Chemistry

Sherwin Maeser, Professor and Head of Department; Delbert Greenwood, Melvin C. Cannon, Theodore M. Burton, Professors; Harris O. Van Orden, Norman Bauer, Associate Professors; Sigrid S. Kennington, Instructor.

The degree of Bachelor of Science in Chemistry is a professional degree, and graduates must meet the minimum requirements of the American Chemical Society besides fulfilling the group requirements of the College given in the introduction of this catalog. To aid the students in registering, the following suggested schedule is given.

### Suggested Schedule

#### Freshmen

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

	F	W	S
Chem. 3, 4, 5 .....	5	5	5
Math. 35, 46, 97 .....	5	5	5
Group requirements in biological and/or social sciences.....	5	5	5
Physical Education or Military Science and Tactics .....	1	1	1
Total.....	16	16	16

\*On leave.



- B. For students who enter college with credit for only 1 unit of algebra and  $\frac{1}{2}$  unit of geometry:

	F	W	S
Chem. 3, 4, 5 .....	5	5	5
Math. 34, 35, 46 .....	3	5	5
Group requirements in biological and/or social sciences.....	8	5	---
Eng. 10 or 11 (special petition must be made to take this course in freshman year) .....	..	..	5
Physical Education or Military Science and Tactics.....	1	1	1
Total.....	17	16	16

### Sophomores

- A. For students with mathematics:

	F	W	S
Math. 98, 99 .....	5	5	..
English 10 .....	..	..	5
Physics 20, 21, 22 .....	5	5	5
Chemistry 17, 18, 19 .....	4	4	3
Lower Division requirements .....	3	3	4
Physical Education or Military Science and Tactics.....	1	1	1
Total.....	18	18	18

NOTE: Five credits lower division group requirements must be completed in junior year.

- B. For students with incomplete mathematics:

	F	W	S
Math. 97, 98, 99 .....	5	5	5
Physics 20, 21, 22 .....	5	5	5
Chemistry 17, 18, 19 .....	4	4	3
Lower Division group requirements .....	3	3	3
Physical Education or Military Science and Tactics.....	1	1	1
Total.....	18	18	17

### Juniors

	F	W	S
Chemistry 121, 122, 123 .....	5	5	5
German .....	5	5	5
Electives in geology, biology, social science, English.....	5	5	5
Total.....	15	15	15

### Seniors

	F	W	S
Chemistry 104, 105, 106 .....	3	3	3
Chemistry 109, 110, 111 .....	1	1	1
Chemistry 135 .....	3	..	..
Chemistry 160 .....	1	1	1
Chemistry 191 .....	..	..	5
English 111 .....	..	4	..
Physics 120, 121, 130 .....	3	3	3
Electives (must include at least 3 credits adv. Chem.).....	6	4	5
Total.....	17	16	18

### Master of Science Degree in Chemistry

The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical. Besides graduate courses (in the 200 series), courses 116, 135, 155, 191 may be used towards the Master's degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's degree by other departments if the student's supervisory committee approves.

Before admission to candidacy for the degree, all graduate students are required to pass the National Cooperative Test Examinations of the American Council of Education for undergraduate training in General Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry.

### Courses

**3, 4, 5. Chemical Principles and Qualitative Analysis.** Introduction to chemical theory and principles of chemistry, including introductory qualitative analysis. Prerequisites: high school chemistry or physics, algebra and geometry. For science majors, pre-medical and pre-dental students, and home economics majors in foods and nutrition. Three lectures, two labs. (5F, 5W, 5S) **Maeser**

**10, 11, 12. General Chemistry.** Fundamental principles of inorganic and organic chemistry. A one-year terminal course open to any matriculated student. Students with a grade of B or higher may enter Chemistry 5 in the spring quarter. (5F, 5W, 5S) **Staff**

**17, 18. Quantitative Analysis.** Theory and practice of gravimetric and volumetric analysis. A terminal course for majors in agriculture and home economics. Prerequisite: Chem. 5 (4F, 4W) **Cannon**

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

**31, 32, 33. Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of all three quarters. (3F, 3W, 3S) **Staff**

**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) **Bauer**

**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 equivalent. (4F, 4W) **Van Orden**

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

**115. Quantitative Analysis, A Brief Course.** Basic theory and laboratory practice of quantitative analysis. A terminal course designed primarily for pre-medical and pre-dental majors. Prerequisite: Chem. 5 (5S) **Cannon**

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

**121, 122, 123. Organic Chemistry.** Fundamentals of chemistry of carbon compounds. Terminals at the end of the second quarter for non-chemistry majors who do not desire more than ten hours credit. Prerequisites: Chem 5 or a grade of B or higher in Chem. 12. (5F, 5W, 5S) **Burton**

**124. 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) **Burton**

**135. Chemical Literature.** Exercises in finding, assembling and using information available in technical publications. (Given alternate years. Given 1945-55.) (3F) (This course should precede or accompany English 111.) **Burton**

**155. Glass Blowing.** A laboratory course in the technique of manufacture and repair of laboratory glassware. (2W) **Burton**

**160. Seminar.** (1F, 1W, 1S) Time arranged. **Staff**

**190. Elementary Biochemistry.** The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins, and hormones and their transformation in plants and animals. Prerequisites: Chem. 12 or equivalent. For students not majoring in Chemistry. (5F) **Van Orden**

**191. 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 Chemistry, and others having adequate background in Chemistry. (5S) **Van Orden**

**198. Senior Research Problems.** Any quarter. Time and credit arranged. **Staff**

**215. Chemical Thermodynamics.** Application of basic thermodynamic principles to selected physical-chemical problems. Prerequisites: Physical Chem. 104, 105, 106; Math 98, 99. (5W) **Bauer**

**225, 226, 227. Advanced Organic Chemistry.** Lecture course for graduate students. Includes modern theories and special topics in organic chemistry. Taught alternate years. Prerequisites: Chem. 123, 106. (2F, 2W, 2S) **Burton**

**232. The Colloidal State and Surface Chemistry.** Fundamental properties of colloidally dispersed systems. Application of physical-chemical principles to surface and membrane phenomena. Examples of colloidal behavior are selected from diverse fields of interest, such as: industrial catalysis, dairy processing, cell physiology and soil mechanics. Prerequisites: Physical Chem. 104, 105, 106; Math. 98, 99. (5F) **Bauer**

**234. Qualitative Organic Analysis.** The classification, reactions and laboratory work involved in identification of unknown organic compounds. Taught alternate years. (Taught in 1954-55). Prerequisites Chem. 19 and 123. (3S) **Burton**

**250. Advanced Inorganic Chemistry.** Based on the periodic table and atomic structure. Designed for Chemistry seniors and graduates and others having similar training. (3S) **Maeser**

**252. Chemical Forces and Molecular Structure.** An interpretation of chemical and physical properties of matter in terms of electrostatic and electrodynamic forces between fundamental particles. Structural properties derived from X-ray crystallography are emphasized. Prerequisites: Chem. 104, 105, 106, Math. 98, 99. (5S) **Bauer**

**270. Chemical Microscopy.** Lecture and laboratory practice in use of the microscope and its accessories as applied to chemistry, with special reference to rapid qualitative methods and analysis of minute amounts of material. Prerequisite: Quantitative Analysis. (2 or more; W) **Cannon**

**272. Optical Method of Chemical Analysis.** Problems in spectroscopy, spectrophotometry, colorimetry, refractometry, and microscopy. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3F) **Cannon**

**273. Electro-Chemical Methods of Analysis.** Instruction in Potentiometry, Polarography, Electro-analysis, and related methods as applied to analytical chemistry. Prerequisites: Quantitative Analysis and Physical Chem. (3W) **Cannon**

**274. Advanced Quantitative Analysis.** Special problems in quantitative analysis. Prerequisite: Chem. 19. Time and credit to be arranged. **Cannon**

**289. Animal Metabolism.** Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in animals. Chemical and biological tests made on rations, animal tissues, blood, urine, and other secretions and excretions when indicated. Time and credit arranged. **Greenwood**

**292. Biochemistry.** Problems in metabolism—micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisite: Chem. 190 or 191 or equivalent. (3F) **Greenwood**

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

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

**295. Advanced Biochemistry.** Carbohydrates, proteins, fats and minerals and their metabolism in plants and animals. Prerequisite: 190 or 191. (3F) **Greenwood**

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

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

**298. Research.** Graduate students majoring in chemistry may elect research in any branch of the subject. Any quarter. Time and credit arranged. **Staff**

## English

Wallace J. Vickers, Professor, and Head of Department; King Hendricks, Carlton Culmsee, Hubert W. Smith, Wendell M. Keck, Ira N. Hayward, Professors; Moyle Q. Rice, Associate Professor; Stanley P. Andersen, Thornton Y. Booth, John J. Stewart, Maxwell D. Edwards, Blair Hansen, J. Lynn Mortensen, Assistant Professors; Pearl S. Budge, Veneta Nielsen, Instructors.

### English Major Requirements

Students who intend to major in English must complete English 1, 10, 53, and 60; also one of the following: English 40, 46 or 47. These courses should be completed before beginning work on the required upper-division courses. It is highly desirable to complete History 34 and at least one year of a foreign language during the freshman and sophomore years.

English 105, 110, 117, 162, 163, two period courses (161, 175, 180, 190, 191), two courses in American literature numbered above 150, and one additional literature course numbered above 120, and at least 19 credits in a foreign language are required of majors in English. English 124, The Teaching of English, is recommended for English majors and teaching majors in English. Students must maintain a "B" grade average in their major subjects. Teaching majors in English meet the same requirements as regular majors except for 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 re-

quirements for a minor. English-Speech majors should take English 1, 53, 117, 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.

### Courses

**A. Drill in Essentials of English.** To assist students with English deficiencies. Students whose standing in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10 and English 17. (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. Daily. (3) **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. Daily. (3) **Smith**

**1. College Grammar.** (5 F or W)

**Vickers**

**2. Mechanics of Writing.** An elective review course for the student of average ability, providing instruction in fundamentals of sentence structure, usage, punctuation, and spelling, and including a limited amount of writing. Not counted toward fulfilling the composition requirement. (3F, W or S) **Mortensen**

**5. Scientific Vocabulary.** A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (3F, W or S) **Keck; Hansen; 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 information, and in expository writing; demands clear, forceful expression, and requires a full third of a student's time. (5F, W or S) **Staff**

**17, 18, 19. Freshman.** For Forstry, 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. (3F, 3W, 3S) **Staff**

**22. Children's Literature.** Prose and poetry of childhood. Helpful to teachers and parents. (3F, W or S) **Mortensen**

**23. Literature for Adolescents.** A class designed to acquaint prospective teachers with the literature read in the junior high and high school (3W) **Rice**

**31. Floating Poetry.** Poetry that has lived in 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**

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

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

**35. Nineteenth Century Novel.** Reading and analysis of the best novels by major English, American, and Continental novelists. (3W) **Edwards**



- 37. Contemporary Novels.** Reading and interpretation of the best twentieth century novels. (3F, W or S) **Rice; H. Smith; Andersen**
- 38. The Essay.** Writers of the present—American and English. (3S) **Edwards**
- 40. World Literature.** A survey course including a study of epic and romance, tragedy, comedy, and satire, as these forms have appeared in Greek, Roman, Hebrew, Italian, French, German, English and American literature. (5F, W or S) **V. Nielsen; Hansen**
- 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 works by great philosophers from Plato to the present. (5S) **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**
- 53. American Literature.** Survey of American literature from the beginnings to the present, with emphasis on main literary trends and ideas characteristic of American culture. Open to English majors or minors and to others by permission of the instructor. (5F, W, or S) **Hayward**
- 60. English Literature.** A survey of the principal masterpieces of English literature. (5W) **Edwards; Mortensen; Hansen**
- 63. 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. (3W) **Vickers**
- 105. History of the English Language.** The evolution of the English language from Anglo-Saxon times to present. (3) Taught alternate years. **Hendricks**
- 110. Advanced Composition.** For students who have taken English 10; may be taken in place of English 19 by students who have credit in English 17 and English 18 and who have transferred from Forestry or Engineering; may be taken by transfer students who have six credits in Composition. Emphasizes vocabulary, selection, and clear organization of information. (4F, W or S) **Staff**
- 111. Technical Writing.** Emphasis upon bibliography, research methods and final form of the technical report. Open to juniors and seniors only. (4F, W or S) **Keck; Edwards**
- 112. Advanced Writing Problems.** A practical course in special problems of writing, such as letters of application, summary abstracts, short reports, and informal articles; mainly for juniors and seniors in forestry or engineering who do not take 111. (4W or S) **Keck**
- 117. Creative Writing.** Short stories, essays, poetry. Considerable freedom of choice as to type. (3F) **Rice**
- 118. Writer's Workshop.** For students who desire special assistance in imaginative writing. Admission is granted to all who show special talent in writing. Prospective students are required to consult the instructor before registering. (2W) **Culmsee**
- 119. Poetry Workshop.** Direction and criticism for students who wish to write poetry. (2S) **V. Nielsen; Andersen**
- 124. (See Secondary Education 124.) The Teaching of English.** **Hayward**



- 134. Literary Criticism.** Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4S) **Culmsee; Edwards**
- 147. Comparative Literature.** A comparative study of the literature of the 18th century of France and England. (5F) **Hendricks**
- 148. Comparative Literature.** A comparative study of the Romantic period in England and Germany. (5W) **Hendricks**
- 149. Comparative Literature.** A study of the 19th Century in England, France and Russia. (5S) **Hendricks**
- 150. American Poetry.** Development of American poetry as shown through writings of major poets from Philip Freneau to the present. (3W) **Hayward**
- 151. American Fiction.** A brief consideration of the beginning of the American novel and short story, followed by detailed study of important nineteenth and early twentieth century fiction writers. (3) **Smith**
- 154. Major American Authors.** Intensive studies of the chief American novelists, poets, and essayists of the Nineteenth Century: a. Edgar Allen Poe; b. Ralph Waldo Emerson; c. Nathaniel Hawthorne; d. Herman Melville; e. Mark Twain; f. Henry James; g. Walt Whitman... These courses are taught when required. (2) **Smith; Hayward**
- 161. Medieval Literature.** English literature from Beowulf to the Renaissance, exclusive of Chaucer. Emphasis on the epic and the metrical romance. Some continental literature included. Reading in translation. (5) **Vickers**
- 162. Chaucer.** Relation of Chaucer to his time; his influence upon subsequent literature. Emphasis upon oral reading. (5F) Taught alternate years. Not given 1954-55. **Hendricks**
- 163. Shakespeare.** Six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. (5S) Taught alternate years. Not given 1954-55 **Vickers**
- 167. Arthurian Legends.** The legends and their relation to English literature. (3) **Nielsen**
- 168. Readings in World Drama.** A survey of world drama from the beginning to Ibsen. (5W) **Hayward**
- 169. Reading in World Drama.** A survey of world drama from Ibsen to the present. (5S) **Hayward**
- 170. Milton.** Selected prose and poetry with emphasis on "Paradise Lost." (5S) **Vickers**
- 175. Elizabethan and Stuart Literature.** Poetry and prose works, exclusive of those of Shakespeare and Milton, from 1557 to 1660. (5F) **Rice**
- 180. The Eighteenth Century.** A comprehensive study of the literature from 1700 to 1798. (5) **Keck**
- 185. Eighteenth Century Novels...** Major novels by Defoe, Richardson, Fielding, Smollett, Sterne, and Goldsmith. (3F) **Keck**
- 190. Romantic Period.** A brief study of the predecessors of romanticism; a study of the literature from 1798-1832, 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. (5S) **Smith**

192. **Shelley.** His relation to the Romantic movement. (2S) **Rice**
196. **Victorian Essays.** Reading and discussion of shorter Victorian prose writings on literary, philosophical, social, economic, and other problems important then and now. (4) **Booth**
197. **Victorian Novel.** Reading and discussion of a representative work by each of several English novelists. Analysis is made of construction, characterization, ideas, style and other important characteristics of the novel as it has developed to English. (4) **Booth**
199. **Readings and Conference.** Time and credit arranged. Any quarter. Limited to English majors. Instructor's approval required. **Staff**
200. **Thesis.** Time and credit arranged. **Staff**
203. **Tragedy.** A study of the theory and practice of tragedy from Aeschylus until the present. (5) **Vickers**
204. **Comedy.** A study of the theory of comedy and of the use of comedy in various literary forms. (5) **Vickers**
211. **Bibliography and Research Methods.** An intensive course in preparation of bibliography, use of source materials, and other problems of thesis writing. Open to graduate students only; recommended for first quarter of graduate study. (2F, W or S) **Keck; Hendricks**
247. **Seminar in Comparative Literature of the 18th Century.** Research studies in the inter-relations of English and Continental literature between 1700 and 1832. Time and credit arranged. (4) **Hendricks**
252. **The New England Circle.** Principal New England writers from Bryant to Henry Adams. (5) **Hayward**
261. **Readings in Middle English.** Middle English Metrical Romances. (4) **Hendricks**
280. **Seminar.** Intensive study of special problems in 18th century literature. (5) **Keck**
290. **Seminar. Nineteenth Century Literature.** Intensive study of special problems and selected writers in the period. (4) **Smith**

## Journalism

Major students in Journalism should complete Journ. 12, 13, 14, 16, 81, 112, 114, 115, 125, 156 or 164; Engl. 1, 5, 10, 53, 110, 117, or 118 or 119.

They are urged to complete as many of the following as possible: Engl. 40, 46, 60, 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.

Students may major in Photographic Journalism, for which the following courses are required: Journ. 12, 13, 14, 112, 115 and 120 or 156. In addition, students must study all courses required by the Photography Department for this major.

Majors in Agricultural Journalism and Home Economics Journalism, designed to meet needs of individuals, are available.

1, 2, 3. **College Journalism.** For members of Student Life staff. Discussions of paper and responsibilities of journalists. (1F, 1W, 1S) **Staff**

4, 5, 6. **College Journalism.** Second year. (1F, 1W, 1S) **Staff**

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) **Stewart**

**13. Reporting.** A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12 (3W) **Stewart**

**14. Reporting.** A continuation of 13. Prerequisites: 12 and 13. (3S) **Stewart**

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

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

**81. Introduction to Radio and Television.** See Speech Department for description.) (3F) **B. Hansen**

**82. Radio Speech.** (See Speech Department for description.) (3W) **B. Hansen**

**83. Elements of Broadcasting.** (See Speech Department for description.) (3S) **B. Hansen**

**91. Weekly Paper.** Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly. (3F) Taught alternate years. **Stewart**

**112. Writing Feature Articles.** Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals is made to determine available markets and what editors buy. (3W) **Culmsee**

**114. Writing for Radio.** Study and practice in writing information and continuity for radio programs. (3W) Taught alternate years. **Stewart**

**115. Law of the Press.** Law of libel, right of privacy, contempt of court, copyright, and postal regulation. (2W) Taught alternate years. **Staff**

**116. History of Journalism.** American newspaper men and their contributions to journalism; also modern newspaper trends. (5S) **Culmsee**

**120. Journalistic Techniques.** For non-journalism majors. Techniques which aid professional people, extension workers and others to use newspapers, magazines and radio for publicity and information purposes. (3F) **Stewart**

**125. Editorial Page.** A study of editorials and other elements of the modern editorial page, and the writing of editorials. (3F) **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)

**164. Publicity Methods.** Media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: 12, 13, 14 or permission of instructor. (3W) **Drake**

**166. Journalism Practices.** Laboratory work in publications or radio stations. (2) **Staff**

**182. Radio Newscasting and Writing.** Offered in both Speech and Journalism Departments. Study and application of principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5S) Taught alternate years. **B. Hansen; Stewart**

**185, 186, 187. Special Problems in Journalism.** (1-2F, 1-2W, 1-2S)

## Geology and Geography

**J. Stewart Williams**, Professor and Head of Department; **Clyde T. Hardy**, Associate Professor of Geology.

**Geology Club:** The Geology Club, under general supervision of the department, is an organization for all geology students. Meetings are held twice each month, and programs consist of talks by guests, faculty, and students. Regular attendance is required of all advanced undergraduates. All interested persons are invited to attend.

### Bachelor of Science Degree in Geology

**Minimum Requirements:** All majors must satisfactorily complete the following basic courses: Chemistry 3, 4, 5; Civil Engineering 82, 84; Engineering Drawing 61, 63; English 110, 111; Geology 2, 3, 5, 101, 102, 106, 108, 110, 114, 115; Mathematics 35, 46; Physics 20, 21, 22; and Zoology 3. Recommended electives are Mathematics 97, 98, 99; German 1, 2, 3; and Civil Engineering 85, 181.

**Upper Division Options:** Advanced undergraduates must select one or more upper division options no later than the beginning of the senior year, and must request assignment to a major professor. Approval of the course program by the major professor must be obtained in advance of each registration. Minimum requirements in each upper division option are as follows:

Petroleum Geology: Geology 105, 109, 111, 112.

Mining Geology: Geology 103, 105, 112, 113.

Ground-water Geology: Geology 103, 112, 115, 117; C. E. 173.

Stratigraphy—Invertebrate Paleontology: Consult Major Professor.

**Field Trips:** Field work is an essential part of training in geology. Majors should therefore be prepared to reserve Saturdays during Fall and Spring quarters for field trips.

### Master of Science Degree in Geology

The Department of Geology and Geography offers advanced study and research leading to the Master of Science degree in Geology with specialization in areal geology, stratigraphy—invertebrate paleontology, and ground-water geology. Graduate students in geology may take the following courses in the 100 series for credit: Geology 102, 103, 105, 109, 111, 113, 116, and 117. Graduate students in other departments may take any course in the 100 series for graduate credit.

### Geology

**1. Introductory Physical Geology.** For students in non-science areas. Field trip required in Fall and Spring quarters. (5F, W or S) **Field Staff**

**3. Physical Geology.** For students in Forestry, Engineering, Agronomy, etc. A five-dollar laboratory deposit is required for loss and breakage. Field trip required in Fall and Spring quarters. (5F, W or S) **Field Staff**

**4. Historical Geology.** Physical history of the earth, and the development of life as indicated by the geologic record. Prerequisite: Geol. 1 or 3 (5W) **Field Staff**

**5. Minerals, Rocks, and Fossils.** Identification of common minerals, rocks, and fossils. Prerequisite: Geol. 3. (3S) **Field Staff**

**31, 32, 33. Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics, and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements. (3F, 3W, 3S) **Field Staff**

**101. Mineralogy.** Identification of common minerals by physical and chemical tests. Elementary crystallography. Prerequisites: Geol. 3 and Chem. 3, 4, and 5, or equivalents. (5F) **Hardy**

**102. Optical Mineralogy and Petrography.** Determination of minerals in grains and thin sections utilizing the petrographic microscope. Classification of igneous rocks. Prerequisites: Geol. 101 and Physics 22. (5W) Taught alternate years. Not taught 1954-55. **Hardy**

**103. Engineering Geology.** Application of geology to engineering problems. For seniors in Engineering. (3S) **Williams**

**105. Sedimentary Petrography: Mineralogical Analysis.** Determination of mineral grains by means of the polarizing microscope. Heavy mineral separation. Prerequisite: Geol. 102. (3S) Taught alternate years. Not taught 1954-55. **Hardy**

**106. Invertebrate Paleontology.** Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geol. 2 and Zool. 3. (5W) Taught alternate years. Not taught 1954-55. **Williams**

**108. Stratigraphy and Sedimentation.** Processes by which sedimentary rocks are formed. Original structures of sediments. Recognition of stratigraphic units by means of index fossils. Prerequisites: Geol. 3 and 106. (5S) Taught alternate years. Not taught 1955-56. **Williams**

**109. Sedimentary Petrography: Mechanical Analysis.** Mechanical analysis of sediments. Statistical representation. Prerequisite: Geol. 101. (3F) Taught alternate years. Not taught 1954-55. **Hardy**

**110. Structural Geology...** Origin and classification of geologic structures. Deformation of the crust of the earth. Prerequisite: Geol. 3. (5F) Taught alternate years. Not taught 1955-56. **Staff**

**111. Petroleum Geology...** Origin and accumulation of petroleum. Subsurface methods utilized in exploration including a survey of geophysical techniques. Prerequisites: Geol. 108 and 110. (5W) Taught alternate years. Not taught 1955-56. **Hardy**

**113. Economic Geology: Metals.** Geologic occurrence and distribution of metallic mineral deposits. Prerequisites: Geol. 101 and 110. (5S) Taught alternate years. Not taught 1954-55. **Hardy**

**114. Geologic Field Methods.** Preparation of geologic and topographic maps utilizing the plane table. Measurement of stratigraphic sections. Field problems required. Prerequisites: Geol. 3; Civil Engineering 82 and 84. (5S) Taught alternate years. Not taught in 1955-56. **Staff**

**115. Advanced Physical Geology.** Processes of erosion. Action and development of streams. Land forms. Subsurface water. Prerequisites: Geol. 3 and college mathematics, chemistry, and physics. (5F) **Williams**

**116. Special Problems.** Directed study of selected problems. Written report required. (1-6F, W or S) **Staff**

**117. Ground-Water Geology.** Geologic conditions that control the occurrence and purity of ground water with special reference to western United States. Prerequisite: Geol. 3. (4W) **Williams**

**210. Seminar.** Prerequisite: Graduate standing. (2-5F, W or S) **Staff**

**220. Thesis.** Prerequisite: Graduate standing. (5-15F, W or S) **Staff**

## History

Joel E. Ricks, Professor, and Head of Department; John Duncan Brite,\* Professor; George Ellsworth, Associate Professor.

\*On leave

Students who major in History should complete History 4, 5, 13, 14, and thirty additional credits of upper division History selected in conference with the head of the department. History majors intending to pursue graduate study should complete two years of French or German.

Students who minor in History should consult with the head of the History Department for specific recommendations before registering in the minor field.

### Survey Courses

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

**2. Modern European History.** A survey of modern European history from the seventeenth century to the Second World War. (5) **Brite**

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

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

**8. Recent European History.** From the Treaty of Versailles in 1919 to the present, emphasizing the problems following that war and the underlying causes of World War II. (3) **Brite**

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

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

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

**34. English History.** English history from the earliest times to the present day. (5) **Brite**

### History of Europe

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

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

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

**124. Renaissance and Reformation (1250-1600).** (5S) **Ellsworth**

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

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



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

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

### History of the United States

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

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

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

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

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

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

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

### Hispanic-American History

160. **Hispanic-America.** Historical survey of the Americas south of our border, including the Pre-Columbian peoples, European discovery, exploration and colonization, international rivalries, institutional developments, struggle for Independence, emergence of modern Latin American states, contemporary movements and problems. (5F) Ellsworth

### Far Eastern History

176. **History of the Far East.** (3S) Ricks

### Seminar

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

### Graduate Courses

229. **Seminar. Problems in the Industrial Revolution.** (3) Brite

239. **Seminar in the History of the Mountain West.** (3) Ellsworth

276. **Selected Problems in the Constitutional History of the United States.** (3) Ricks

292. **Seminar in the Sources and Literature of History.** (3) Brite

293. **Seminar in the Method and Writing of History.** (3) Ellsworth

299. **Thesis.** (F, W or S) Time and credit arranged. Staff

## Landscape, Architecture and Planning

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

Laval S. Morris, Professor and Head of Department; Kenji Shiozawa, Instructor.

See "Landscape Architecture" in School of Agriculture for course descriptions.

- 3. Elements of Landscape Architecture and Planning.
- 20. Drawing.
- 30. History and Literature of Landscape Architecture.
- 35. Theory of Design.
- 40, 41. Plant Materials.

### ARCHITECTURE

- 60, 61, 62. Architectural Design.
- 130. Recreational Planning.
- 140, 141, 142. Design.
- 150, 151, 152. Planning Design.
- 160, 161, 162. Landscape Construction.
- 165. Construction Methods and Practice.
- 170. Civic Planning.
- 180, 181, 182. Advanced Planning and Design.
- 190. Special Problems.
- 195. Seminar.
- 120. Advanced Problems.

### Mathematics

V. H. Tingey, Professor and Head of Department; Neville C. Hunsaker, Professor; Mary Nelson, Joe Elich, Associate Professors; Joseph K. Everton, Assistant Professor.

Two types of majors are offered by the Mathematics Department. Students intending to enter graduate study in mathematics take the regular major. Those intending to teach in high schools take the regular major or the teaching major.

Regular majors are required to take mathematics 130, 131, 132 and fifteen additional credit hours of upper division mathematics. Regular majors should have a reading knowledge of either French or German. Physics 20, 21, and 22 and nine credit hours of upper division physics are recommended.

Students expecting to teach mathematics in high school must meet the state requirements for certification in addition to meeting the requirements of a regular major in mathematics.

All students majoring in mathematics must have had plane and solid geometry. **Plane geometry is a prerequisite for all college mathematics.**

B. Plane Geometry. (F or W)

3. Solid Geometry. (2F or W) Prerequisite: two years high school algebra, or mathematics 34.

34. Introduction to College Algebra Prerequisite: one year of high school algebra. Students who have had more than one year of high school algebra are not given college credit for mathematics 34. Daily. (3F, W or S)

35. College Algebra. Prerequisite: 34. (5F, W or S)

44. Plane Trigonometry. Prerequisite: 35. (3F, W or S)

46. Plane and Spherical Trigonometry. Prerequisite: 35. (5F, W or S)  
 50. Descriptive Astronomy. (3S)  
 60. Mathematics of Finance. Prerequisite: Math. 35.  
 97. Plane and Solid Analytical Geometry. Prerequisite: 35, and 44 or 46.  
 (5F, W or S)  
 98. Differential Calculus. Prerequisite: 97. (5F, W or S)  
 99. Integral Calculus. Prerequisite: 98. (5F, W or S)  
 100. Calculus. Prerequisite: 99, (3S)  
 118. Modern Algebra. Prerequisite: 99. (3W)  
 119. Theory of Equations. Prerequisite: 99. (3W)  
 120. Modern Geometry. Prerequisite: 97. (3W)  
 122. Ordinary Differential Equations. Prerequisites: 99. (3F or S)  
 123. Number Theory. Prerequisite: 99. (3S)  
 124. Foundations of Mathematics. (3S)  
 130. Advanced Calculus. Prerequisite: 100. (3F)  
 131. Advanced Calculus. Prerequisite: 130. (3W)  
 132. Advanced Calculus... Prerequisite: 131. (3S)  
 145. Vector Analysis. Prerequisite: 99. (3F)  
 150. The Teaching of Mathematics in the Elementary and High School. (3F or S)  
 153. Mathematical Readings. Prerequisite: 123. (3S)  
 246. Tensor Analysis. Prerequisite: 145. (3W)  
 254. Theory of Functions. Prerequisite: 132. (3F)  
 255. Theory of Functions. Prerequisite: 254. (3W)  
 256. Theory of Functions. Prerequisite: 255. (3S)  
 257. Advanced Applied Mathematics for Physicists, Chemists and Engineers.  
 Prerequisite: 132. (3F)  
 258. Advanced Applied Mathematics for Physicists, Chemists and Engineers.  
 Prerequisite: 257. (3W)  
 259. Advanced Applied Mathematics for Physicists, Chemists and Engineers.  
 Prerequisite: 258. (3S)

### DIVISION OF STATISTICS

Degree: Bachelor of Science in Mathematical Statistics.

The work in Mathematical Statistics has a three-fold purpose:

- (a) to train professional statisticians.
- (b) to instruct students who wish to broaden their mathematical studies or who seek a mathematical background for studies in economics, sociology, genetics, biometry, psychology and education.
- (c) to conduct research in statistics and train competent consultants on statistical problems.

Mathematics 99 or its equivalent is required of all students taking statistics in the Division of Statistics.

Students wishing to major or minor in statistics will take the courses 160 to 167 inclusive in the Division of Statistics, and Mathematics 122, 130, 131 and 132.

160. Determinant and Matrix Theory. (3F)  
 161. The Calculus of Probability. (5F)  
 162. Mathematics of Statistics. (5F)  
 163. Mathematics of Statistics. (5W)  
 166. Sequential Analysis and the Control of Quality of Output in Manufacturing. (3W)  
 167. Statistical Reading and Reports. (3S)

## MILITARY AND AIR SCIENCE AND TACTICS

### ARMY AND AIR FORCE

A department major in Military or Air Science and Tactics is offered through the School of Arts and Sciences. This major is designed to fit the needs of a student who desires to make a career of service in the Armed Forces. Students desiring to major in Military or Air Science are required to major in another field and thereby complete a dual major. The purpose of the dual major is to assure the student of adequate preparation for his future in the event he is not selected or cannot qualify for a commission in the Armed Forces. All majors at this institution are acceptable to the department for dual majors but the following are particularly recommended: Engineering (civil or electrical), Physics, Chemistry, Mathematics, English, History, Political Science, Psychology.

A student selecting Military or Air Science as a major subject should do so at the beginning of his freshman year in order that sufficient time may be available to complete the basic and advanced military courses.

### REGULAR ARMY AND AIR FORCE COMMISSIONS

The PMST and PAST are authorized to appoint as "Distinguished Military Graduates" certain graduating students who are deemed worthy of commendation by both the President of the College and the PMST or PAST.

Students designated as "Distinguished Military Graduates" from the Army ROTC program are authorized to apply for direct commissions in the Regular Army.

Students who receive reserve commissions in the Air Force Reserve are authorized to apply for regular commissions at the end of one year's active duty. Students having been designated "Distinguished Military Graduates" from the Air Force ROTC program receive additional consideration in selection for regular commissions.

See the "Military and Air Science and Tactics" section in the latter part of the catalog for complete statement of regulations and courses.

## Modern Languages and Latin

George A. Meyer, Professor and Head of Department; M. L. Nielsen, Professor; Thelma Fogelberg, Associate Professor; Aldyth Thain, Jesse G. Nelson, Gordon E. Porter, Assistant Professors.

Intensive elementary language courses are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in shorter time than is required for 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 students who have satisfactorily completed the intensive two quarters' course.

Standard 5-credit elementary courses are provided for students whose aim is primarily a reading and some speaking knowledge of a foreign language and the satisfying of language requirements.

**Major in a modern language:** (Prospective majors are advised to enroll in the intensive courses.)

**French:** The following courses are required: 1, 2, 3, 101, 102, 105, 110, and twelve credits in courses numbered above 110.

**German:** Forty-five credits including courses 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

**Language credit by special examination**—Students who have acquired a working knowledge of a foreign language by residence abroad may obtain a maximum of 15 hours of credit in that language by taking a special examination. Such an examination is given only in those languages in which the department has an instructor competent to examine the student. At present, examinations may be taken in French, German, Spanish, Portuguese, Norwegian, Swedish, and Danish.

In addition to the elementary courses regularly listed below, permissible special examination credit is listed as Norwegian 1, 2, 3; Swedish 1, 2, 3; Danish 1, 2, 3.

**FRENCH**

- 1A, 2A. Elementary French. Intensive Course. Two hours daily. (7F, 7W) Myer
- 1, 2, 3. Elementary French. (5F, 5W, 5S) Staff
- 101A. Intermediate French. Intensive course. (5S) Meyer
- 102A. Intermediate French. (3F) Meyer
101. Intermediate French (3F) Thain
102. Intermediate French. (3W) Thain
105. Advanced Composition and Conversation. (3W) Fogelberg
- 106, 107, 108. Selective Reading. Open to students who have completed French 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S) Staff
109. French Short Story. Student of the French Conte as a literary form 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) Meyer
112. 19th Century French Poetry. (3W) Thain
120. Comedies of Moliere. Moliere's plays as social criticism. (3F) Meyer
121. French Classic Drama. Plays of Corneille and Racine. (3W) Staff
122. Nineteenth Century French Drama. Romantic and Realistic Schools. (3S) Fogelberg
125. Survey of French Literature. (3S) Thain
- 129., 130. French Literature of the 18th Century. Special emphasis on the Philosophy of the period—Voltaire, Rousseau, Ruffon, Diderot. (3F, 3W) Meyer
131. Comedies of Beaumarchais and Marivaux. (3S) Staff
- 135, 136, 137. Nineteenth Century French Novel. (3F, 3W, 3S) Fogelberg

**GERMAN**

- 1A, 2A. Elementary German. Intensive Course. Two hours daily. (7F, 7W)
- 1, 2, 3. Elementary German. (5F, 5W, 5S) Staff
- 101A. Intermediate German. Intensive. (5S) Staff
101. Intermediate German. (3F) Staff
102. Intermediate German. (3W) 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 subjects, 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, Stom, Heyer, 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, Arthur 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' Prose.* Werther, Dichtung and Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) Staff
133. *German Drama of the Nineteenth Century.* Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) Staff
150. *Phonetics and conversation.* Especially for returned missionaries and others who have had experience with the language abroad. (3) Nielsen
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
101. *Intermediate Spanish.* (5) Fogelberg
102. *Intermediate Spanish.* (5) Fogelberg
- 101A. *Intermediate Spanish.* Intensive Course. (5S) Fogelberg
- 102A. *Intermediate Spanish.* (5F) 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 subjects, scientific or literary. (1-2F, 1-2W, 1-2S) Staff
125. *Survey of Spanish Literature.* (3S)

### GREEK

- 1, 2, 3. *Elementary Greek.* (5F, 5W, 5S) Meyer

### LATIN

- 1, 2, 3. *Latin.* Emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of English. Recommended for English majors and for pre-law and pre-medical students. Includes reading from Caesar. (5F, 5W, 5S) Thain
- 101, 102, 103. *Vergil and Cicero.* Readings from the orations of Cicero and Vergil's Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3S) Nielsen
- 104, 105, 106. *Selective Readings in Latin.* (2F, 2W, 2S) Nielsen



**PORTUGUESE**

**1, 2, 3. Portuguese.** Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5F, 5W, 5S) **Meyer**

**101, 102, 103. Second Year Portuguese.** Grammar, reading, conversation and composition. Credit arranged. (F, W, S) **Meyer**

**106, 107, 108. Selective Readings.** One or two credits. (1-2F, 1-2W, 1-2S) **Meyer**

**RUSSIAN**

**1, 2, 3. Russian.** (5F, 5W, 5S)

**Staff**

**Physics**

**Rolland Perry**, Professor and Head of Department; **Philip J. Hart**, Associate Professor; **Jay O. Jensen**, Assistant Professor.

**Willard Gardner**, Professor Emeritus.

Requirements for Physics Majors: 45 credits, of which 30 credits must be upper division courses. Certain approved courses in upper division Engineering, not to exceed 10 credits, may be counted.

Suggested courses: The following sequence of courses is recommended for students who wish to continue in graduate study in physics. 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 by the School of Education.

Freshman Year: Mathematics 35, 46, 97; Chemistry 3, 4, 5; Botany 1 or Zoology 1; Economics 51; 5 credits Social Science.

Sophomore Year: Physics 20, 21, 22; Math. 98, 99, 100; English 10; German or French.

Junior Year: Physics 120, 121, 130, or Physics 175, 176, 177; Math. 119, 122, 145, 160; English 110; 5 credits Biological Science; German or French.

Senior Year: Physics 153, 154, 155, 185, 186, 187, 193, 194, 195; one other year course in Physics; Math. 120, 130, 131, 132; Chem. 104, 105, 106.. Language group electives.

A Teaching Minor in Physics is approved only for students majoring in closely related subjects. Such students must complete Physics 20, 21, 22, and at least 9 credits of upper division work.

**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 upper division courses in five of the following areas: Mechanics, Heat and Thermodynamics, Geometrical and Physical Optics. Electricity and Magnetism, Modern and Nuclear Physics, Meteorology, Physical Chemistry, Electronics, Sound. If the candidate has fewer than six credits in certain of these five fields, he may be requested to take additional work in those areas as part of the work for the Master's degree.

**Courses**

**3. Introductory Physics.** A non-technical course for students who do not expect to major in sciences but who want understanding of fundamental physical principles and their applications. (5F, W or S) **Jensen**

**6, 7. General Physics.** Physics 6 covers mechanics, constitution of matter, heat, and meteorology. Physics 7 emphasizes electricity and magnetism, with a survey of light and sound. Primarily designed for students in forestry and Agriculture. (Physics 6, 5 credits F or W; Physics 7, 5 credits S) **Jensen**

**16. Introductory Meteorology.** A non-mathematical treatment of physical laws governing the atmosphere and its phenomena. Brief study of the polar-front theory, air-mass analysis, weather map reading, forecasting, and information required by the Civil Aeronautics Administration for flying. (3F) **Jensen**

**17, 18, 19. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Sound and Light.** For Pre-Medical, Pre-Dental, Agriculture and Technology Majors. Prerequisite: Math. 44 or 46. Should be taken in sophomore year, and in the sequence indicated, except with permission of instructor. Three lectures, two labs and two quiz periods per week. (5F, 5W, 5S) **Jensen**

**20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Sound and Light.** For Science majors and Engineers. Prerequisite: Math. 44 or 46. Concurrent or previous registration for calculus desirable. To be taken in sequence except with permission of instructor. Should be taken in the sophomore year. Three lectures, two labs and two quiz sections per week. (5F, 5W, 5S) **Hart**

**31, 32, 33. Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics, and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of three quarters' work. (3F, 3W, 3S) **Staff**

## UPPER DIVISION

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken in Junior year.

**Physical Chemistry.** See Chemistry 104, 105, 106 and Chemistry 109, 110, 111. **Soil Physics.** See Agronomy 214.

**117. General Meteorology. (Physics of the Air.)** Atmospheric physics and weather phenomena using both dynamic and synoptic procedures. Brief study of meteorological apparatus, observations, map reading, forecasting, and basic principles of aeronautical meteorology. Prerequisite: Physics 6 or 22 and Calculus. Four lectures, one lab. (5S) **Jensen**

**120, 121. Modern Physics.** (Recommended for juniors.) A study of electrons, ions, atomic structure and radiation. (3F, 3W) **Perry**

**130. Nuclear Physics.** (To follow Physics 121.) A survey of methods and results of recent investigations of nuclear processes. (3S) **Perry**

**140. Biophysics.** Principles of electricity, light, X-rays and radioactivity as related to studies in biology. (5F) **Hart**

**146. Sound.** An intermediate course in sound and vibration. Taught alternate years. (3S) **Hart**

**153, 154. Analytical Mechanics.** Prerequisite: Differential Equations. (3F, 3W) **Perry**

**160, 161, 162. Heat; Thermodynamics; Kinetic Theory.** (3F, 3W, 3S) **Hart**

**166, 167. Geometrical and Physical Optics.** (3F, 3W) **Hart**

**175, 176, 177. Electricity and Magnetism.** Electrostatics, magnetostatics, D. C. and A. C. circuits, electromagnetism, and electromagnetic theory. Use of the calculus and differential equations. (3F, 3W, 3S) **Perry**

**182. Electronics.** Emphasis on design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. Three lectures, one lab. (4 Arr.) **Staff**

**185, 186, 187. Physical Measurements.** A laboratory course to give the advanced student experience with precision measuring instruments and their use in physics. Measurements in electricity and magnetism, heat, optics and spectroscopy, atomic and nuclear physics. Recommended for seniors. (2F, 2W, 2S) **Perry**

**193, 194, 195. Seminar in Physics.** A weekly meeting of staff and physics majors, consisting of reports on recent developments in physics. Students receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for this course or not. (1F, 1W, 1S) **Staff**

**196, 197, 198. Selected Readings on Physics.** (1F, 1W, 1S) **Staff**

## GRADUATE COURSES

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

**210, 211. X-Ray Diffraction; X-Ray Crystallography** (3W, 3S) **Hart**

**220, 221, 222. Atomic Spectra, Molecular Spectra, and Spectroscopic Measurements.** (5F, 5W, 5S) **Perry**

**230, 231, 232. Nuclear Physics.** (3F, 3W, 3S) **Perry**

**250. Research in Physics.** Credit to be arranged before registration. (F, W, S) **Staff**

**285, 286, 287. Introductory Quantum Mechanics.** Prerequisite: Advanced Calculus. (3F, 3W, 3S) **Perry**

**290, 291, 292. Theoretical Physics.** (3F, 3W, 3S) **Hart**

**293, 294, 295. Seminar in Physics.** (1F, 1W, 1S) **Staff**

Upon sufficient demand other courses may be offered.

## Speech and Drama

Chester J. Myers, Professor and Head of Department; Rex E. Robinson, Floyd T. Morgan, Associate Professors; Burrell F. Hansen, Gwendella Thornley, Parley Newman, Assistant Professors; George Tanner, Instructor.

The Department of Speech and Drama offers training in interpretation, dramatic art, public address, broadcasting, and speech pathology.

The requirements of forty-five credit hours for a departmental major or a teaching major in Speech are as follows: Public Speaking, 8 credits (Speech 125 required of all majors); Interpretation, 8 credits (Speech 124 required of all majors); Drama 8 credits (4 credits in Speech 150 required of all majors); Speech Correction, 5 credits (Speech 167 required of all majors); Radio, 6 credits (Radio Production required of all majors); elective courses in Speech, 10 credits. In addition, courses in Dramatic Literature, 5 credits and Teaching of Speech, 2 credits, are to be recommended by the Department Head according to student needs.

English courses 163, 168 may be used for credit toward the department requirement in dramatic literature.

For the Composite English-Speech Major, students are required to have the following speech courses: Public Speaking, 8 credits; Interpretation, 8 credits; Drama, 8 credits; Speech Correction, 5 credits; Radio, 3 credits; Teaching of Speech, 2 credits. For a distribution of these courses see second paragraph above.

Students whose understanding of spoken English shows the need of special assistance may be requested to register for Speech 11 as a prerequisite for Speech 1 or Speech 5.

### Master of Science Degree

The Department of Speech offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Speech Pathology, interpretation, theatre, public address and radio.

The following courses may be used for graduate credit by students majoring in the Speech Department or by students in other departments: 107, 110, 111, 123, 124, 125, 150, 152, 154, 171, 173, 181, 182, 184, 185, 186, 190, 192.

### COURSES

**1. Public Speaking A.** (Formerly Fundamentals of Speech) Elementary training in Public Speaking. Includes training in daily speaking situations, voice improvement. Clinic assistance available to students who need it. Time for clinical assistance to be arranged. Credit is not given to students who have taken Speech 5. (5F, W or S)  
Staff

**4. Principles of Reading.** Effective oral and silent reading of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes both standard literature and everyday reading matter. (5F, W or S)  
Thornley

**5. Public Speaking B.** Meets specific needs of professional people in the practice of their profession. Basic principles of effective speaking, with emphasis on preparation and delivery of forms and address of greatest interest to those for whom the course is provided. Credit is not given to students who have taken Speech 1. (3F, W or S)  
Staff

**7. Voice Improvement 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 other courses in public speaking and oral interpretation. (3F)  
Staff

**11. Speech for Foreign Students.** Designed to help foreign students with conversational vocabulary developments. (3F, W, S)  
Staff

**12. Individual Problems.** Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill, and solve individual speech problems. Recommended for everyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged.  
Staff

**16. Dialect.** The most prominent dialect forms, their principles and uses. The dialect work of such writers as Burns, Kipling, Drummond, Riley, Dunbar, Harris, and Kirk is studied, discussed and learned. Taught alternate years. (3S)  
Myers

**21. Intermediate Public Speaking.** (Formerly Advanced Public Speaking) Students work with types of speaking most interesting and useful to them, and determine lengths of speeches and times to speak, within the framework of certain minimum requirements. Emphasis on developing skill in speech presentation. Prerequisite: Speech 1 or 5. (3W 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)  
Myers

**26. Make-up.** Straight and character make-up. For Speech and Music majors and minors, M. I. A. workers and prospective teachers. Theory and practice in the art of make-up. (1F)  
Staff

**44. Fundamentals of Acting.** Problems of terminology, interpretation of role, and body movement. (3F)  
Staff

**50. Theatre Workshop.** Limited credit is given for participation in Utah State Theatre plays. Two lecture periods per week, laboratory and rehearsal times arranged. Consult instructors for permission to register. Any quarter, 2 to 6 credits  
**Morgan; Tanner**

**60. Drama Appreciation.** An introduction to the understanding and enjoyment of dramatic literature, radio and T.V., drama, and moving pictures. Selected readings of dramatic masterpieces and other writings on the theatre. (3F) **Staff**

**75. Remedial Speech.** For persons who have a noticeable difficulty with speech, in articulation, quality, pitch intensity, or rhythm. Time and credit arranged. Consult instructor before registering. May be taken more than one quarter.  
**Staff**

**81. Introduction to Radio and Television.** Radio and TV station and network organization, operations, and programming. Attention given to developing an understanding of radio and T.V. as factors in social organization, and to developing appreciation in selection of programs. (3F)  
**Hansen**

**82. Radio Speech.** Analysis and development of speech skills and speech forms used in radio. Development of acceptable standards of voice and articulation for radio presentation. Includes exercises in presentation of announcements, talks, program continuities, interviews and roundtables. (3S)  
**B. Hansen**

**83. Elements of Broadcasting.** The various aspects of broadcast programs with practice in each. Writing and production of commercial continuity, news, musical programs, and dramas are carried out. (3W)  
**B. Hansen**

**84. Studio and Control Room Operations.** Basic studio and control room operations carried out by the announcer in small radio stations. Information is basic for radio producers, announcers, and educators who use radio. 1 hour lecture and 2 hours of lab. per week. (2F)  
**B. Hansen**

**107. Speech Hygiene...** Primarily for public school teachers, but can be used by those desiring emphasis in speech correction. Attention to normal speech development and detection of speech abnormalities found in the classroom. Does not fulfill speech pathology requirements for Speech majors. (3W)  
**Staff**

**109. Public Discussions.** Application of various group discussions techniques to current problems. Efforts are made to have some discussions presented to various civic and religious organizations, or to release them over a commercial radio station. (3S)  
**Robinson**

**110. Public Programs.** Scene and play reading. Taught alternate years. Not taught 1954-55. (3W)  
**Myers**

**111. Psychology of Speech.** 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)  
**Staff**

**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 instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged.  
**Staff**

**113. Argumentation.** For the student desiring a background of information and practice in techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. Required for credit in Speech 115, Intercollegiate Debating. (3F)  
**Robinson**

**114. Writing for Radio.** (3S) (See Journalism Division)

**115. Intercollegiate Debating.** Members of debating squads may receive not more than three credits in any one year. Credit is granted only to those having credit in Speech 113, Argumentation. (3F, W or S)  
**Robinson**



- 118. Story-Telling.** Analysis and classification of typical stories with reference to periods of the child's development. Consideration is given stories of western pioneer life. Especially for the student teacher, recreation leader, church activity leader, librarian, and parent. (5F, W, or S) .....Myers
- 120. Playground Dramatics and Pageantry.** Principles involved in playground dramatics, make-up, pageantry, story-telling, and related activities. Taught alternate years. (3W) Myers
- 123. Teaching of Speech.** (Education 123) Methods and problems peculiar to the teaching of speech; organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2F) Myers
- 124. Advanced Interpretation.** The mastering of significant selections from great writers. Reading from manuscript and from memory. (5S) Myers
- 125. Speech Composition.** Advanced theory and practice of public speaking. Students build and deliver several short speeches and read selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore standing, and Speech 1 or 5. (5W) Robinson
- 144. Advanced Acting.** Problems of characterization, tempo, and more advanced body movements. Analysis of the role. (3W) Staff
- 146. Stage Directing.** Fundamental principles of directing plays, musical comedies, pageantry, opera, and the dance. Theory and practice. (3S) Staff
- 150. Drama Production.** Principles, procedures, and materials of play production. Scene design and construction, scene painting, lighting, costuming, and management are studied, and principles learned are applied to presentation of plays. Students are assigned to work crews in Utah State Theatre productions. (2-3F) Tanner
- 152. Drama Production Laboratory.** Four hours per week of crew and staff work on Utah State Theatre productions. (2W) Tanner
- 54. Continuation of Speech 152.** (2S) Tanner
- 158. Children's Theatre.** Creative dramatics for children. Educational dramatics for students preparing to direct children in dramatic work. A study is made of plays suitable for primary and intermediate schools. The College Training School affords opportunity for this work. For prospective elementary school teachers. Consult instructor before registering. (3-5S) Morgan
- 167. Introduction to Speech Correction.** Required of all Speech and Speech Correction majors and those taking a composite Speech and English major. An elective for majors in Psychology. 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. (5F) Staff
- 171. Speech Pathology.** Advanced speech correction. Disorders such as pathological voice defects, cleft palate, difficulties in hearing and deafness, aphasia, and spastic speech receive particular attention. Prerequisite: Speech 167. (3W) Staff
- 173. Clinical Techniques in Speech and Hearing.** An introduction to clinical procedures in speech and hearing. Observation and practice. Prerequisite or corequisite: Speech 167. Consult instructor for permission to register. Any quarter. Credit arranged. Staff
- 174. History of the Theatre.** An historical survey of the theatre from ancient to modern times. (5W) Morgan
- 176. Problems of the High School Drama Director.** Play selection, organization of the production, drama club activities, contests and festivals, simplification of settings, lighting and costumes, financing, auditorium and stage facilities, central



staging, audio-visual aids, bibliography are studied. Also recommended to directors and prospective directors of church and community theatres. (3S) **Morgan**

**181. Radio Production.** Study and studio practice in problems in directing and producing various kinds of broadcasts. Planning programs, casting and rehearsal procedures, co-ordination of technical aspects of production, and problems in special studio effects are considered. Registration limited to Juniors and Seniors. (3S) **B. Hansen**

**182. Radio Newscasting and Writing.** Gives credit in both Speech and Journalism departments. Principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. Taught alternate years. (5W) **Stewart; B. Hansen**

**184. Educational Broadcasting.** Study and practice in the preparation and broadcasting of educational programs for children and adults. Designed to acquaint teachers, extension agents, civic workers, and others engaged in public informational activities with the broadcast services. Taught alternate years. Not taught 1954-55. (3W) **B. Hansen**

**185. Advanced Radio Production.** Follows 181 and deals with more specialized production problems such as remote pick-ups, integration of recorded with live material, network and local studio co-ordination, documentary productions, dramatic problems and special events. Prerequisite: Speech 181. **B. Hansen**

**186. Radio and Television Training.** Enrollment limited to students best qualified by training and ability for actual broadcasting experience in a station. Students so qualified are allowed to register for from 3 to 5 credits. Students serve an apprenticeship under direction of the station staff in executing duties expected of a regular staff employee. Students render three hours service per week broadcasting for each registered hour of credit. (Time and credit arranged. (F, W, S) **B. Hansen**

**190. Problems in Speech and Drama.** Especially selected work, individually assigned, handled and directed in consultation with the student. Special Speech problems of merit and of mutual interest to students and instructors are investigated and reported upon in this course. Consult instructor for permission to register. Any quarter. Credit and time arranged. **Staff**

**192. Projects in Theatre...** Advanced work in theatre arts and crafts. Projects may be worked out in connection with major productions of the Utah State Theatre or they may be independent endeavors. Scene Design, (F & S), Costume Design (F & S), Costume Construction (W & S), Stage Lighting (F & S), Technical Practice (W & S), Advanced Makeup (W), Theatre Management (S), Acting (W & S), Directing (S). By permission of instructors. 2 to 5 hours credit. A total of 9 credits may be earned in Projects courses.

## GRADUATE COURSES

**200. Seminar in Speech or Drama.** Emphasis on the various fields of Speech. Research problems. (2F or W) **Staff**

**201. Thesis.** Prerequisite: Graduate standing. (2-5F, W or S) **Myers and Staff**

**207. Experimental Methods in Audiology.** Lecture and laboratory periods in basic concepts of psychophysics and psychophysiology of the ear with emphasis on functional tests of hearing. Prerequisite: graduate standing. (3F) **Staff**

**208. Experimental Phonetics.** Principles and techniques in scientific analysis of speech and voice. (3W) **Staff**

**208. Experimental Phonetics.** Principles and techniques in scientific analysis of speech and voice. (3W) **Staff**

**209. Voice and Articulation Disorders.** Prerequisite: Graduate standing. Theory and practice of voice and articulation retraining. Practice in examinations, diagnosis, and treatment, attention to the problems of both children and adults. Review of studies relevant to the field. (2S) **Staff**

**210. Problems of the Producing Director.** Problems of Educational Theatre and Community Theatre management. The following problems are investigated and discussed: Community Theatre organization and publicity; Community Festivals; Programming; Budgets and Finances. (3S) **Morgan**

**290. Research Studies.** Advanced research in Speech and Drama. By permission of instructors. Any quarter. Credit arranged. **Staff**

**292. Projects in Theatre.** Advanced work in scene design, costume design and construction, technical practice, stage lighting, directing, theatre management, make-up. Projects may be part of major productions of the Utah State Theatre or they may be independent endeavors. By permission of instructors. Any quarter. Time and credit arranged. **Morgan**

## Zoology

### ZOOLOGY, ENTOMOLOGY, PHYSIOLOGY

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

D. M. Hammond, Professor and Head of Department; Clyde Biddulph, Eldon J. Gardner, William F. Sigler, Professors; J. Sedley Stanford, T. L. Bahler, Donald W. Davis, Associate Professors; Merrill Gunnell, Gene H. Linford, Assistant Professors; Howard E. Dorst, F. V. Lieberman, G. E. Bohart, H. F. Thornley, William H. Chinn, George H. Kaloostian, William P. Nye, M. D. Levin, Paul R. Fitzgerald, Collaborators in Research, U. S. D. A.

For a major in Zoology the following courses must be taken: Zoology 3, 4, 107, 112, 116 or Entomology 115, 118 or 119; 127 or 128, 131; Entomology 13 and Physiology 121, 122. Also the following courses are recommended: Mathematics 34, 35, 44; Agronomy 131, 132; Chemistry 3, 4, 5, 125, 126; Physics 17, 18, 19; Botany 24, 25; Bacteriology 70, 71; Wildlife 160; Geology 3, 4. For students planning graduate work leading toward the Ph.D. degree, study of foreign languages is recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction to the School of Arts and Sciences must be completed, and in addition the following courses must be taken: Zoology 107, 119, 127 or 128, 129, 131, 116 or Entomology 115.

### Master of Science Degree

The Zoology, Entomology, and Physiology Department offers courses leading toward the Master of Science degree in various phases of agricultural entomology, genetics, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

### ZOOLOGY

**1. Principles of Biology.** See Biology.

**2. General Zoology.** A brief survey of the more important groups of animals and the basic principles of greatest importance in Zoology. This course is especially designed to meet the needs of students in Agriculture and Forestry for a basic course in Zoology. Three lectures, two labs. (5F or S) **Staff**

**3. Invertebrate Zoology.** An introduction to invertebrate animals, emphasizing basic principles, organization of the major groups, and evolutionary relationships. Three lectures, two labs. (5F or W) **Staff**

**4. Vertebrate Zoology.** A study of the vertebrates, with emphasis on structure, function, evolutionary relationships and some consideration of natural history. (5W or S) Prerequisite: Zool. 3 or equivalent. **Staff**

**107. History and Literature of Biology.** The more important men and ideas in the historical development of biology and the methods of finding references. (4F) **Gardner**

**111. Heredity.** Facts and principles of inheritance, with emphasis on application to human beings. It is desirable but not essential that an introductory course in biology, physiology, or botany precede this course. (4F or S) **Linford**

**112. Principles of Genetics.** A technical course in basic principles of heredity and variation. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (5F, W, or S) **Gardner**

**113. Human Genetics.** Inheritance of human, physical and mental characteristics and associated problems. Prerequisite: a course in zoology or physiology. **Gardner**

**116. Parasitology.** Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Prerequisite: Zool. 3. Three lectures, two labs. (5S) **Bahler**

**118. Vertebrate Embryology.** An introduction to the principles of development of the vertebrates. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5W) **Hammond**

**119. Comparative Anatomy.** Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5S) **Hammond**

**121. Ornithology.** Bird study planned to acquaint students with native birds and the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution are studied in classroom, laboratory, and field. Two lectures, two labs. (4S) **Stanford**

**122. Mammalogy.** Introduces students to Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance are stressed. Two lectures, two labs. (4W) **Stanford**

**123. Natural History of Animals.** Identification, habits, food, distribution and other features of common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Laboratory time is spent in making observations and collections in the field. Some long field trips are taken. Prerequisite: One or more courses in Zoology. Two lectures, two labs. (4F) **Stanford**

**127. Cytology.** Study of cells, with emphasis on chromosomes and their behavior. Two lectures, two labs. (4W) **Gardner**

**128. Elements of Histology.** Study of tissues, including characteristics of different kinds of tissues and the main organs. Three lectures, two labs. (5F) **Bahler**

**129. Histological Technique.** Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3S) **Bahler**

**131. Organic Evolution.** Critical study of the facts and theories pertaining to evolution. Prerequisite: One basic course in biological science. Zool. 111 or 112 recommended. (3W) **Gardner**

**135. Protozoology.** A study of local free-living and parasite protozoa and methods of studying them. Prerequisite: Zool. 3. Two labs. (2F) **Hammond**

**155. Ichthyology.** Ecology, classification, and life histories of native and introduced fishes. Two lectures, one lab. (3W) **Sigler**

**201. Special Problems.** Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W or S) **Staff**

**214. Advanced Genetics.** Intensive study of problems of inheritance, with special consideration given to recent and current research. Prerequisite: Zool. 112. (3S) **Gardner**

**240. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S) **Staff**

**221, 222, 223 Seminar.** Attendance required of all graduate students in department during each quarter in residence. Problems relating to research in general or to current researches in zoological science are discussed by faculty, graduate students, and advanced undergraduates. (1F, 1W, 1S) **Staff**

## Entomology

For a major in Entomology, the following courses are required: Zoology 3, 4, 107, 111 or 112, 131; Entomology 13, 101, 103, 108, 111, 115, 120; Chemistry 156 (Chemistry of Insecticides and Fungicides). The following courses are recommended: Mathematics 34, 35, 46; Agronomy 131, 132; Chemistry 3, 4, 5, 125, 126; Physics 17, 18, 19; Botany 24, 25, 30, 130; Wildlife 160; Range 126; and one basic course in each of the following departments: Agronomy, Horticulture, and Vegetable Crops. For students planning to do graduate work leading toward the Ph.D. degree, study of foreign languages is recommended.

For a major in Agricultural Entomology see Department of Zoology in School of Agriculture.

**13. General Entomology.** The structure, classification, distribution, inter-relationships, and life histories of insects. Three lectures, two labs. (5S) **Davis**

**21. Beekeeping.** Introduction to principles and practices of beekeeping, how to establish a colony, seasonal management of colonies for honey production and pollination purposes; swarm control, honey harvest, and wintering practices. Two lectures, one lab. (3S) Taught alternate years. **Levin**

**101. Insect Morphology.** Comparative study of external structure, with emphasis on parts used in taxonomy. Prerequisite: Ent. 13. Two lectures, 2 labs. (4) **Stanford**

**102, 103, 104. Systematic Entomology.** Study of classification, including the making of a collection of representative insects, arrangement in phylogenetic sequence, and placing of specimens in orders. For 103 the collection must be enlarged and specimens must be placed in families. Permission to take 104 is dependent upon the collection and level of performance in 103, and available specimens in one or more orders are classified to species. Prerequisite for 102: Ent. 13. Prerequisites for 103: Ent. 101 and 102. Prerequisite for 104: 103. Three labs. (102, 3F; 103, 3W; 104, 3S) **Davis**

**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**

**108. Agricultural Entomology.** Insect pests of major economic importance to agriculture, including their recognition, type of damage done, distribution, life history, and methods of control. Three lectures, two labs. (5F or S) **Davis**

**111. Anatomy and Physiology of Insects.** Comparative study of internal structure with considerable attention given to function. Prerequisite: Ent. 101. Two lectures, 2 labs. (4W) **Stanford**

**115. Medical and Veterinary Entomology.** Arthropods are studied that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague,

spotted fever, tularemia, malaria and other Arthropods carrying disease receive major attention. Prerequisite: Ent. 13 or equivalent. Two lectures, two labs. Taught alternate years. (4W) **Stanford**

**120. Insect Pollination in Relation to Agriculture.** The role of pollinating insects in agriculture, including beekeeping as related to crop pollination, utilization of native pollinating insects, and special problems in the pollination of many commercial crops. (2W) **Bohart**

**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) **Stanford**

**210. Special Problems.** Individual study of a problem under guidance of a staff member. Prerequisites: Ent. 13, 103 and 108. Credit arranged. (F, W or S) **Staff**

**230. Insects in Relation to Plant Diseases.** Insect vectors of plant diseases, their habits, modes of transmission and dissemination of plant pathogens. Prerequisite: Ent. 13 or 108. Taught alternate years. (3W) **Davis**

**231. Biological Control of Insect Pests.** Invertebrate parasites and predators, vertebrate predators, and diseases are considered as they relate to suppression or control of insect pests. (3W) **Davis**

**233. Aphidology.** Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 102. (2W) Taught alternate years. **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, S) **Staff**

## Physiology

For a major in Physiology the following courses must be taken: Physiology 4 115, 116, 117, 121, 122, 123; Biology 1, Zoology 107, 112, 118, 119, 128, 129 and 131; Bio-chemistry 191. Also Mathematics 34, 35 and 44; Physics 17, 18, 19; Chemistry 3, 4, 5, 17, 18 or 115, 125, 126; Bacteriology 70, 71; and at least one year of a foreign language are recommended.

**4. General Physiology.** For the student who desires a survey of physiology but who is not planning advanced intensive study. It deals with the functioning of the human body with emphasis upon broad general biological principles. (5F, W or S) **Staff**

**20. Human Anatomy.** Structure of the main human body systems with emphasis on the muscular, skeletal and nervous systems. For students desiring a more thorough study of human anatomy than is given in Physiology 4. Prerequisite: Physiology 4. Two lectures, one lab. (3F) **Linford**

**121., 122. Mammalian Physiology.** An intensive and detailed two-quarter course in physiology in which the function of each of the organ systems of man and animals is studied. Students may not register for 122 without having had 121. As preparation, Physiol. 4, Zool. 2, 3, or 4, or Vet. Sci. 20, and courses in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) **Biddulph**

**123. Endocrinology.** The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiol. 4 or Biol. 1 or Zool. 2, 3, or 4, or Vet. Sc. 20 are recommended. (3S) **Biddulph**

**131. Comparative Physiology.** A comparative study of the physiological functions, primarily of the vertebrates. Prerequisite: Physiology 4. Two lectures, one lab. (3S) **Biddulph**

**200. Special Problems.** Special investigations in physiology are carried out in this laboratory course. Open to students who have taken Physiol. 121, 122 or who have been granted special permission. (2-5F, W or S) **Staff**

**241. Methods of Endocrine Research.** Methods used in studying the endocrine glands. Prerequisite: Physiol. 123. (3F) **Biddulph**

**260. Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. **Staff**



## SCHOOL OF COMMERCE

M. R. MERRILL, Dean

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## SCHOOL OF COMMERCE

M. R. MERRILL, DEAN

### 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. The School comprises three major divisions—business, the social sciences, and agricultural economics and marketing. Graduates of this School are prepared to assume leadership and responsibility in business and in various industries and professions. Students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Business Education, Economics, Political Science, Sociology, Social Work, and Agricultural Economics and Marketing.

For the profession of law, the courses in Economics and Political Science afford excellent preparation. Graduates who have met the necessary requirements 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 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.

### Pre-Legal Training

Students who plan to enter the profession of Law may pursue a course of study, primarily in the School of Commerce, that will not only prepare them to meet all entrance requirements in any American law school, but will also form an excellent foundation for the study of law. There is always opportunity for capable, well-trained lawyers.

Some law schools admit only college graduates. Others admit students on the basis of three years of college training. College graduation is desirable even when it is not required for admission.

All pre-legal students should consult Dean M. R. Merrill or Professor Wendell Anderson.

## Agricultural Economics and Marketing

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

G. T. Blanch, Professor and Head of Department; V. L. Israelsen, Professor; R. H. Anderson, E. M. Morrison, Associate Professors; Wells M. Allred, Assistant Professor; Lynn H. Davis, Instructor; Carole N. Maughan, Research Assistant; M. H. Taylor, Leon C. Michaelson, Extension Economist; \_\_\_\_\_, Federal Collaborator in Research.

W. P. Thomas, Professor Emeritus.

Students majoring in 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 required by this department for students majoring in the School of Agriculture. Those graduating from the School of Commerce must satisfy the requirements of that school and must complete the other courses required by this department.

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 be graduated 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.

**Master of Science Degree**—The Department offers opportunity for research and graduate study leading to a Master of Science degree. The 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, 155, and 163. Graduate students in other departments may use the same courses for graduate credit except 122.

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

See Agricultural Economics and Marketing in School of Agriculture for course listings.

### Suggested Course of Study for Students Majoring in Agricultural Economics in School of Commerce

Course	Credits	Course	Credits
<b>Exact Sciences:</b>		<b>Economics:</b>	
Math. 34 .....	3*	Agri. Econ. 53 .....	5†
Math. 35 .....	5*	Economics 107 .....	3†
Chem. 10 .....		Economics 108 .....	3†
or Physical Sci. 31 .....	5†	Economics 155 .....	3
Chem. 11 .....		Economics 165 .....	3
or Physical Sci. 32 .....	5†	Other .....	6
Chem. 12 or 5 hrs. in .....			
another exact science .....	5†	Total .....	23*
Total .....	23	*A minimum of 18 credits required	
*One of these is required			
<b>Biological Sciences:</b>		<b>Business Administration:</b>	
Zoo. 1 or Botany 1 .....	5†	Accounting 1 .....	5†
Bact. 1 .....	4	Accounting 2 .....	5†
Physiology 4 .....	5	B. A. 25 .....	5†
Total .....	14*	Accounting 150 .....	5
*14 credits required		B. A. 156 .....	5
		Other .....	5
<b>Languages and Arts:</b>		Total .....	30*
Speech 1 .....	5	*A minimum of 20 credits required	
English 40 .....	5		
Total .....	10*	<b>Applied Plant and Animals Sciences:</b>	
*A minimum of 8 credits required		A minimum of 9 credits required	
<b>Social Sciences (Excl. Econ.):</b>		Military Science or	
Sociology 10 or 70 .....	5†	Physical Education .....	6†
Pol. Sci. 1 or 10 .....	5	<b>English Composition:</b>	
Sociology 141 .....	3	English 10 .....	5†
Social Work 165 .....	3	English 110 .....	4†
Total .....	16*	Total .....	9
*A minimum of 12 hours required			

## Journalism:

Journalism 12 .....	3
Journalism 120 .....	3
Total .....	6

## Major:

Agricultural Economics 58, 62, 106, 112, 114, 115, 116, 120, 121†, 122†, 155, 163.	
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Total .....35

†These or equivalent courses required.

## Business Administration

V. D. Gardner, Professor and Head of Department; L. Mark Neuberger, Professor; Ina Doty, Associate Professor; Norman S. Cannon, Leo M. Loll, Floris S. Olsen, Assistant Professors; Stanford L. Johnson, Instructor; Guy Murray, Special lecturer.

W. L. Wanlass, Professor Emeritus.

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

### Credit Toward Master of Science Degree

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

### RECOMMENDED COURSES

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

#### FRESHMAN AND SOPHOMORE YEARS, GENERAL EDUCATION BACKGROUND

##### Physical Education and Military Science

Biological Science Requirements: Biology 1, Physiology 4.

Exact Science Requirements: Chemistry 1, 2; Geology 42; Math. 34, 35, 60; Physical Science 31, 32, 33.

Language Arts Requirements: Art 3, 26; English 40; Landscape Architecture and Planning 3; Music 1, 80, 81.

Social Science Requirement: Economics 27, 51 and 52; Political Science 1 or 10; Psychology 53; Sociology 70.

Communications Requirements: English 10 plus Speech 1 or 5.

Departmental Foundational Work: Ag. Econ. 62; Eng. Drawing 59; B.A. 1 and 2, 20 or 28, 29; Political Science 11, 12, 13; Secretarial Science 65, 86, 87.

#### JUNIOR AND SENIOR YEARS CONCENTRATIONS

Accounting: B.A. 101, 102, 103, 107, 111, 121, 122, 123, 126, 127, 128, 129, 131, 132, 140, 141, 164; Political Science 104, 105, 106, 107, 108; English 110; Secretarial Science 99, 175.

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

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

**Management:** Tool Engineering 51, 52, 58; B.A. 131, 132, 133, 134, 135, 149, 150, 111, 151, 152, 153, 155; Economics 165, 171, 174, 180, 125, 126, 127; Psychology 155; Industrial Education 117, 118, 120; English 110.

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

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

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

#### Special Offerings for Mature Persons Who Are Not Candidates for Degrees

For capable, mature persons whose education has been interrupted by war or other causes and who want maximum professional training in a minimum of time, two two-year courses in addition to the one in Secretarial Science have been organized in the School of 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 students who know definitely that they will not seek a degree should pursue these courses, and then only after consultation with the head of the department. A special course in problems of small business is included. A diploma certifying completion will be given.

### ACCOUNTING

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

**Burroughs 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.)

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

**107. CPA Problems.** Selected problems from professional examinations in various states. (3S) Cannon

**109. Accounting for Non-Commercial Students.** For Engineering, Agriculture, Home Economics, Forestry, and other non-commercial students. (3F, W) Gardner; Cannon

**111. Industrial Cost Accounting.** Job costing, process cost accounting, standard costs, estimating cost systems, distribution cost, special considerations. (5W)

**Gardner**

**121, 122, 123. Auditing Theory and Practice.** Principles and procedures presented to give practical knowledge of auditing. Prerequisite: A good working knowledge of accounting principles and techniques. (3F, W, S)

**Cannon**

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

**Cannon**

**127, 128. Income Tax Accounting.** Current Federal and State Income Tax Laws. Practical problems in preparation of income tax returns. (3F, W)

**Cannon**

**129. Governmental Accounting.** Basic principles underlying treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. Not given 1954-55.

**Cannon**

## MANAGEMENT

The degree program in Management is offered through the combined resources of the Schools of Commerce, Education, and Engineering and Technology. It is designed to provide thorough professional training in Executive Development for business and industry. Majors are offered in three areas:

- 1. Business Management.** Gives training in executive development for students whose basic training is in the field of Business Administration.
- 2. Industrial Management.** Gives training in executive development for students whose basic training is in Engineering, Technology or Industrial Education.
- 3. Personnel Relations.** Gives training for counseling, testing, consultation and guidance in industry and business.

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

### The Core Curriculum

(For All Students in Management)

Freshman Year		Junior Year	
	Cr.		Cr.
Economics 51, General Economics.....	5	Ind. Educ. 118, Industrial Safety.....	3
Psychology 53, General Psychology.....	5	Psychology 155, Psychology of	
Speech 1, Public Speaking .....	5	Business and Industry .....	3
Political Science 1,		Ind. Educ. 102, Instructional Aids.....	3
Government and the Individual.....	5	Psychology 161, Social Psychology....	3
Math. 34, Introduction to		Bus. Adm. 109, 110,	
College Algebra .....	3	Accounting (Applied) .....	6
Math. 35, College Algebra .....	5	Econ. 125, Trade Unions and	
Military Science 1, 2, 3.....	3	Collective Bargaining .....	3
Work Experience in Industry		Econ. 126, Trade Unions and	
(10 weeks)		the Law .....	3
		Econ. 127, Social Security .....	3
		Work Experience in Industry	
		(10 weeks)	



Sophomore Year		Senior Year	
	Cr.		Cr.
Botany 1, Principles of Biology.....	5	Sociology 241,	
Physiology 4, General Physiology.....	4	Community Organization .....	3
Sociology 70, Principles of Sociology..	5	Ind. Educ. 119, Job Evaluation	
Chemistry 31, 32, Physical Science....	6	and Wage Incentives .....	3
Political Science 11, Commercial Law	3	Sociology 163, Industrial	
Sociology 140, Social Psychology.....	3	Sociology .....	3
Military Science .....	3	Bus. Adm. 133, 134, 135,	
Work Experience in Industry		Industrial Manage. Problems .....	9
(10 weeks)			

## BUSINESS MANAGEMENT

### Concentration in Manufacturing

(Courses required in addition to the core curriculum)

Freshman Year		Junior Year	
	Cr.		Cr.
B.A. 1, Introductory Accounting.....	5	B.A. 131, Business Statistics .....	3
Econ. 52, Economic Problems .....	5	Econ. 165, Money, Credit and Prices..	3
B.A. 2, Introductory Accounting.....	5	T.E. 158, Manufacturing Analysis.....	3
		B.A. 132, Business Statistics.....	3
		Econ. 171, Business Cycles.....	3
		English 110, Advanced Composition..	4
		I.E. 120, Personnel Relations.....	3
Sophomore Year		Senior Year	
	Cr.		Cr.
E.D. 59, Blueprint Reading and			
Industrial Drawing .....	3	Econ. 174, Government and Business..	5
T.E. 56, Machine Practice		Econ. 107, 108, Intermediate	
for Engineers .....	3	Economic Theory .....	6
English 10, Sophomore Composition..	5	B.A. 111, Industrial Cost Accounting..	5
P.S. 12, Commercial Law .....	3	B.A. 150, Managerial Accounting.....	4
B.A. 28, Business Finance .....	5	B.A. 149, Business Policy .....	4
T.E. 58, Manufacturing Processes.....	2	Electives .....	6
P.S. 13, Political Science .....	3		

## MANAGEMENT

**Business Communications.** (See Secretarial Science 30.)

**20. Problems of Small Business.** A survey of problems encountered in starting a small business. Problems and details of actual operating procedures are considered. Designed to aid the man just entering business. (5F or W) **Johnson**

**28. Business Finance.** The structure of corporate enterprise. Financial and operating ratios and proper financial plans and methods of marketing securities are considered. Open to qualified sophomores. Practical problems emphasized. Prerequisites: Econ. 51, 52 or equivalent; B. A. 1, 2, (5F) **Gardner**

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

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

**Commercial Art and Posters.** (See Art 31.)

**Color.** (See Art 32.)

**Psychology of Business and Industry.** (See Psychology 55 and 155.)

**Mathematics of Investment.** (See Math. 60.) Urged for all accounting majors.  
**Indexing and Filing.** (See Sec. Sci. 65.)

**Blueprint Reading and Industrial Drawing.** (See Civil Engineering 59. Required of all sophomore majors in Management.)

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

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

**133, 134, 135. Industrial Management Problems.** Problems in industrial location; choice of site; buildings and layouts; selection, purchase, and arrangement of equipment; purchasing of stores; organization; industrial research; labor relations and problems in managerial control. Problems in work simplification, time and motor study included in 1934. Prerequisite: B. A. 20. (3F, W, S) **Gardner**

**Investment Principles.** (See Economics 139)

**140. Insurance.** Studied from the standpoint of the consumer of insurance services. Topics treated include: types of life, property and casualty insurance contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management and government supervision over insurance companies. **Johnson**

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

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

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

**149. Business Policy.** A co-ordinating course aimed to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control and social aspects of business. Required of all Bus. Adm. majors. (5S) **Gardner**

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

**155. Personnel Administration.** Critical analysis of problems of labor management that confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems and selected cases. (3S) **Neuberger**

**Business Cycles.** (See Econ. 121.) Required of all Bus. Adm. majors.

**Money, Credit, and Prices.** (See Econ. 165.) For Bus. Adm. majors.

**Office Management.** (See Sec. Sci. 175.) \* Required of all accounting majors. **Neuberger**

**Economics of Business Cycles.** (See Econ. 171.) Required of all Bus. Adm. majors.

**Government and Business.** (See Econ. 174.)

**Money, Income and Employment.** (See Econ. 180.)

**190. Seminar in Business Education.** (See Sec. Sci. 190.)

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

## BUSINESS AND DISTRIBUTIVE EDUCATION

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

## MERCHANDISING

**Principles of Marketing.** (See Ag. Econ. 52.) Required of all majors in business administration and merchandising.

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

**151, 152, 153. Problems in Merchandising.** Selected cases are used to teach methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. (3F, W, S) Johnson

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

**156. Principles of Advertising.** Intended for those who as business executives will direct publicity programs: includes study of the structure of advertisements, appeals used in the preparation of advertisements for different products, choice of media, consumer research, and the work of advertising departments and agencies. (5S) Johnson

**157. Advertising for Small Business and the Retail Store.** Studies direct mail, radio, television, newspaper, window display, and layout practices. Designed to assist the student in judging advertising effectiveness as a sales tool for the small businessman. (Not given 1954-55) Johnson

**160. Sales Management.** Aims to give a broad view of important phases of sales administration, planning, and execution applied to manufacturing and wholesale concerns. Deals specifically with the structure and functioning of the sales organization and correlation of its activities with those of production and other departments of the business enterprise. (5F) Johnson

**161, 162, 163. Problems in Retail Distribution.** The marketing process from the viewpoint of the retail distributor: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. (3F, W or S) Johnson

**164. Credit Administration.** Nature and functions of credit; forms of credit instruments; sources of credit information, organization and management of credit operating functions; technical and legal aspects of collections; credit and collection control. (Not given 1954-55) Johnson

## Economics

**Evan B. Murray**, Professor and Head of Department; **Leonard J. Arrington**, Associate Professor; **Leo M. Loll, Jr.**, Assistant Professor.

**W. L. Wanlass**, Professor Emeritus.

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

The Department of Economics offers a program of study leading to the Master of Science degree.

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

**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) **Staff**

**52. Economic Problems.** Continuation of Econ. 51. Problems of labor, finance, economic instability; international economics, social waste, government control, and world economic systems. Prerequisite to all upper division courses in Commerce except in Agr. Econ. (5F, W or S) **Staff**

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

**107, 108. Intermediate Economic Theory.** Critical analysis of present-day economic theories of value, distribution, and related subjects. Required of all students majoring in Bus. Adm., Agr. Econ., and Econ. Prerequisites: Econ. 51, 52, or Ag. Econ. 53. (3W or S) **Wanlass**

**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) **Murray**

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

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

**131, 132. Buusiness Statistics.** (See Bus. Adm. 131, 132.)

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

**140. International Economic Relations.** Basic economic relationship between industrial nations, international commerce, farms, and trade restrictions, international debt and finance, and means of promoting progress based on sound economics. Prerequisites: Econ. 51, 52. (3F) **Wanlass**

**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. (3F) **Arrington**

**143. Economy and Trade of Latin America.** Influences exerted by Latin America on world trade. Alternates with Economics 140. (3F) **Wanlass**

**145. Economics of Consumption.** Deals with personal and group expenditure, standards of living, budgets, variations in consumption. (3W) **Wanlass**

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

**155. Principles of Taxation.** Principles involved in establishing the general property tax; income tax; death taxes; taxes upon business; social insurance taxes. Effects of taxes in the American economy. War and postwar finance. Special tax problems of Utah. (3W) **Wanlass**

**165. Money, Credit, and Prices.** Structure and operations of money and financial institutions. Special attention given bimetalism, the gold standard, the money market, and the relation of money and credit to prices. Prerequisites: Econ. 51, 52. (3F) **Wanlass**

**170. Economic Development of the United States.** Development of agriculture, industry, labor, transportation and finance from colonial times to the present. Emphasis on economic development of the Mountain West. (5W) **Arrington**

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

**174. Government and Business.** History and development of regulation and control of business by government. Monopolies, combinations, cartels, public utilities, and transportation are explored. (F5) **Arrington**

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

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

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

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

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

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

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

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



## Political Science

**M. R. Merrill**, Professor and Head of Department; **Wendell Anderson**, **M. Judd Harmon**, Assistant Professors; **Asa Bullen**, Professor Emeritus; **Charles P. Olson**, Lecturer.

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

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

**10. American National Government.** It is desirable but not required that this course be taken before upper division courses in Political Science. (5F, W or S)  
**Staff**

**11, 12, 13. Commercial Law.** Course 11 is a general survey intended for students outside the School of Commerce and is 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)  
**Olson**

**15. American State and Local Government.** The emphasis is on Utah state, municipal and county governments. It follows Political Science 10. (3S) **Anderson**

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

**75. Latin American Governments.** Political and economic relations of the United States with the Latin American states. (3W)  
**Porter**

**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. (3F, S)  
**Merrill**

**102. International Political Relations.** Psychological, economic, racial, and other obstacles to international co-operation, as exemplified in recent events, including relations with Russia, aid to Western Europe, the North Atlantic Pact, control of atomic energy and other weapons of warfare. The program of the United Nations is discussed. (3W)  
**Merrill**

**104, 105, 106, 107, 108. Commercial Law.** Course 104 studies the law of negotiable instruments; 105 and 106 include study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 107 and 108 will not be given in 1954-55. Prerequisites: Political Science 11, 12, 13. (3F, 3W, 3S)  
**Olson**

**110. Basic Problems in International Relations.** Examines current international developments with emphasis on basic problems of international concern, and analysis of various philosophies and systems of government that conceivably might arise as a result of vast changes now evident in the world. (3F)  
**Staff**

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



**117, 118, 119. American Political Thought.** A survey of American political ideas and the men who develop them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present. Emphasis is on ideas that have been significant in shaping the form and actions of American government. Students may register for one, two or three quarters. (2F, 2W, 2S)  
Harmon

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

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

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

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

**129. Public Administration.** Introduction to 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

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

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

**140. American Legislation.** Organization and procedure of legislative bodies. Influences at work in and the character of the output of national and state legislatures. The laboratory method of approach is used as far as is feasible. Parliamentary law is emphasized. (3W)  
Anderson

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

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

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

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

**203. Readings and Conferences.** For seniors and graduate students. Time and credit arranged.  
Staff

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

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

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

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

## Secretarial Science

V. D. Gardner, Professor and Head of Department; L. Mark Neuberger, Professor; Ina Doty, Associate Professor; Floris Olsen, Assistant Professor; Helen Lundstrom, Instructor.

Students majoring in Secretarial Science are urged to complete the following courses in addition to 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

Dept.	No.	Cr.	Dept.	No.	Cr.
Sec. Sci.	30	3	English	5	3
Sec. Sci.	65	3	†Econ.	51	3
Sec. Sci.	75, 76, 77	9	†Econ.	52	5
Sec. Sci.	80, 81, 82	9	Sec. Sci.	175	3
Sec. Sci.	69, 70, 71	3	Sec. Sci.	183, 184, 185	9
Sec. Sci.	86, 87, 88	3	Sec. Sci.	186, 187	6
Sec. Sci.	89, 90, 91	3	†Sec. Sci.	179	3
Sec. Sci.	94 or 92	2	†Sec. Sci.	180	3
Sec. Sci.	98 or 96	2	Sec. Sci.	190	2
Sec. Sci.	167	2	Bus. Adm. Upper Div.	Elective	3
Bus. Adm.	30	3	Econ. Upper Div.	Elective	3
Bus. Adm.	1, 2	10			
Bus. Adm.	25 or 20	5			
Pol. Sci.	11	3			

Students who wish to qualify for a teaching certificate should add the following courses: Psychology 102, Education 113, Bacteriology 155; Education 114, 116 or 141; Education 111, 127, 129, and 130, Methods in Secretarial Science 179 or 180, and a 3-hour elective.

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. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.

### Two-Year Secretarial Course

Fall		First Year		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Biology .....	5	Accounting 1 .....	5	Accounting 2 .....	5
El. Shorthand 75 .....	3	Calculator 94 .....	2	Bus. Communications ..	3
Typewriting 86 .....	1	El. Shorthand 76 .....	3	Bank Posting 98 .....	2
P. E. or M. S. ....	1	Typewriting 87 .....	5	El. Shorthand 77 .....	3
Mathematics 30 .....	3	El. Psychology .....	5	Typewriting 88 .....	1
Underwood Bookkeep- ing machines 98 .....	2	P. E. or M. S. ....	1	P. E. or M. S. ....	1
Total .....	15	Total .....	17	Total .....	15

†These courses count toward filling the group requirements.

‡Required for a teaching certificate.

## Second Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Int. Shorthand 80 .....	3	Int. Shorthand 81 .....	3	Sophomore Comp. ....	5
Transcription Prac. 69..	1	Transcription Prac. 70 ..	1	Int. Shorthand 82 .....	3
Adv. Typewriting 89 ....	1	Adv. Typewriting 90 ....	1	Transcription Prac. 71 ..	1
Bus. Adm. 25 or 20....	5	Economics 51 .....	5	Adv. Typewriting 91 ....	1
Indexing and Filing 65..	3	P. E. or M. S. ....	1	Economics 52 .....	5
Pol. Science 11 .....	3	Electives .....	2	P. E. or M. S. ....	2
P. E. or M. S. ....	1	Scientific Vocab. ....	3	Office Practice 167.....	2
Total .....	17	Total .....	16	Total .....	18

**30. Business Communications.** Fundamental principles of business letter writing. Practice in writing sales, order, collection, adjustment, and application letters. (3W or S) **Neuberger; Lundstrom**

**65. Indexing and Filing.** Training in alphabetic, numeric, triple-check automatic, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters, cards, and catalogs. (3F, W or S) **Lundstrom**

**\*69. Transcription Practice.** Designed to develop skill and speed in transcription from shorthand notes. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words a minute. (1F or W) **Doty; Olsen**

**\*70. Transcription Practice.** Continuation of 69. (1W or S) **Doty; Olsen**

**\*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 study of fundamentals of simplified Gregg shorthand. Emphasis on developing fluency in reading and writing from shorthand plates. (3F or W) **Doty; Olsen**

**76. Second-Quarter Shorthand.** Continuation of course 75. Introduction of the writing of new material. (3F or W) **Doty; Olsen**

**77. Third-Quarter Shorthand.** Continuation of course 76. Practice in new-matter dictation. (3F or S) **Olsen; Doty**

**80. Intermediate Shorthand.** For students who have had previous training in shorthand and who are able to take dictation at not less than 60 words a minute. Includes review of the theory of simplified Gregg shorthand and 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) **Olsen**

**81. Intermediate Shorthand.** Continuation of 80. Must be accompanied by Transcription Practice 70. (3W or S) **Olsen**

**82. Intermediate Shorthand.** Continuation of 81. Must be accompanied by Transcription Practice 71. (3S) **Olsen**

**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 use of mechanical features of the typewriter. Special attention to the developing of typewriting for personal use. (1F, W or S) **Lundstrom; Olsen**

**87. Second-Quarter Typewriting.** Continuation of 86... Attention given sentence and paragraph practice and letter writing. (1W or S) **Olsen; Lundstrom**

**88. Third-Quarter Typewriting.** Completion of style letters. Training in tabulation, continuity writing, and direct dictation. (1W or S) **Lundstrom; Olsen**

\*Required of all who register for Intermediate Shorthand 80, 81, 82.

**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) **Lundstrom**

**90. Advanced Legal Typewriting.** Preparation of legal forms. (1W) **Lundstrom**

**91. Advanced Secretarial Typewriting.** Work on rough drafts, advanced secretarial problems. (1S) **Lundstrom**

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

**94. Burroughs Calculator.** Practice in addition, multiplication, subtraction, and division on Burroughs calculators and application of the machine to such business computations as percentages, discounts, prorating, decimal equivalents, and constants. (2F, W or S) **Olsen; Lundstrom**

**96. Underwood Bookkeeping Machine.** Application of the Underwood bookkeeping machine to business and accounting problems. (2F, W or S) **Olsen**

**98. Commercial and Bank Posting.** Application of the Burroughs posting machine to bookkeeping procedures in commercial and financial institutions and banks. (2F, W or S) **Olsen; Lundstrom**

**99. I. B. M. Machine Operation.** Application of I. B. M. machines to punch card accounting and statistical methods. Latest techniques in sorting, tabulating, and summarizing of numerical data. (2F, W or S) **Hurst**

**167. Office Practice.** Training in use of dictating and transcribing machines, spirit duplicator, mimeograph, mimeoscope. Required of students majoring in Secretarial science and those completing the Two-Year Course. (2F, W or S) **Doty**

**170. Statistical Typewriting.** For juniors and seniors majoring in business administration, economics, and secretarial science. Practice in setting up charts, tables, and reports. Prerequisite: Sec. Sci. 89, 90 and 91 or equivalent. (2F) (Not given 1954-55) **Neuberger**

**175. Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager; type 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 teaching of typewriting and bookkeeping. Analysis of objectives, laws of learning, organization of material, texts, standards of achievement, and methods of presentation. (3W) **Neuberger**

**180. Teaching of Shorthand.** Methods and trends in teaching shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3F) **Doty**

**183, 184, 185. Advanced Speed Course in Shorthand.** For students who have had at least two years of shorthand and are able to take dictation at not less than 100 words a minute. Emphasis on increasing shorthand speed through speed phrases and reporting shortcuts. Practice in advanced transcription. (3F, 3W, 3S) **Doty**

**186, 187. Secretarial Procedures.** Office routines and procedures are studied and practice is given in quantity production of transcripts and business papers. Attention given office conduct and attitudes, personal qualities of a secretary, and obtaining a position. Prerequisite: Two years of shorthand and typewriting, general economics, introductory accounting, and business communications. (3W, 3S) **Doty**

**189. Practicum in Business Education.** Provides opportunity for planning and development of practical or creative projects in Business Education. Experienced

teachers and students who are registered for teacher training, are encouraged to build (projects around actual school situations. (1-2F, W or S) (Not given 1954-55)

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 are made on current business education problems and literature. (2S) (Not given 1954-55)

Neuberger

**200. Research in Business Education.** For senior and graduate students. Time and credit arranged. (F, W or S) (Not given 1954-55)

Neuberger

## Sociology

R. Welling Roskelley, Professor and Head of Department; Don C. Carter Associate Professor; Carmen Frederickson, C. Jay Skidmore, Thel R. Black, William A. DeHart, Assistant Professors.

Joseph A. Geddes, Professor Emeritus.

Majors in Sociology must meet the group requirements for graduation. In addition, they are expected to complete a minimum of 47 credits in Sociology distributed in the following fields: general and historical, 5 credits; Social Organization, 6 credits; Social Problems, 6 credits; Social Psychology and the Family, 6 credits; Social Research and Statistics, 3 credits; Seminar, 3 credits; Cultural Anthropology, 3 credits; Social Work, 9 credits; Population and Industrial Sociology, 3 credits.

Either Soc. 10 or 70 is prerequisite for all upper division courses in Sociology; also Soc. 40 for 140, and 60 for 160.

### Master of Science Degree in Sociology

The Department of Sociology offers courses leading to the Master of Science degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies. Students majoring in Sociology may use the following courses of the 100 series for graduate credit: Sociology 110, 130, 141, 153, 154, 158, 160, 170, 172 and Social Work 165, 177, and 178. These courses may also be used by students in other departments for graduate credit.

### Doctor of Philosophy Degree in Sociology

Institutional requirements for the Ph.D. degree are explained in the section "Graduate School." This degree is offered in the Department of Sociology through collaboration with closely related departments in the social sciences. Resources are now being expanded in rural sociology, in which major emphasis is now made. A program of building resources for emphasis in general Sociology is also contemplated.

**5. American Culture.** Basic beliefs, values, customs, and institutions of the American people. Also study of governmental, educational and other agencies consciously concerned with improvement of American life. (3F)

Black

**10. Rural Sociology.** A groundwork of information which will lead to enlightened rural citizenship and provide a constructive philosophy for living in the country. Digests of programs in 25 or more fields are made. Rural social psychology is emphasized. Conditions in rural Utah are studied. (5F, W or S)

Roskelley; Black

**40. Social Psychology I.** Personality development among social classes and peoples. Analysis of crowds, social movements, social conflicts and other collective behavior; ideologies and institutions. Prerequisite: Soc. 70 or Psych. 53. (3F)

Skidmore

**60. Courtship, Marriage and the Family.** Designed to help all students understand the social and emotional factors in personality development, courtship, mate selection and marriage adjustment. Open to all students. (3F, W or S)

Skidmore



**70. Introductory Sociology.** Open to students in all departments. Emphasis upon developing understanding of the social world, and how social experience contributes to personal development. Sociology 70 or 10 is prerequisite to all upper division classes in sociology and social work. (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 theoretical implications. For majors in Sociology and Social Work. (3F) **....Staff**

**100. Educational Sociology.** The influence of the social processes and social changes on school curricula, objectives and teachers. Appraisal of educational goals in the light of present social needs. (3F) (Not given 1954-55) **Staff**

**110. Utah Social Problems.** Present-day problems in population, migration, housing, insurance, manufacturing, temperance, and safety. (3W) **DeHart**

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

**131. The American Indian.** Indian cultures, problems, and needs. Programs for the improvement of Indian adjustment. Actual and potential contributions of Indian knowledge and philosophy to our way of living. (3S) **Black**

**140. Social Psychology II.** Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: Soc. 40. (3S) **Staff**

**141. Rural Community Organization and Leadership.** Analysis of forces and procedures at work in developing community organization, with special emphasis on techniques of training to help make the community more effective. (3F) **Roskelley**

**144. Women Today.** Progress of women in American society since Colonial days; their struggles for status in industry, politics, education, sex, religion, and the arts. Roles and contributions of outstanding women. (3W) **Frederickson**

**145. Alcoholism.** See P. E. 145. (3S) **Nelson**

**153. History of Social Thought.** Development of social thought from early periods is traced to August Comte. From this point important developments in Europe and America are studied, with emphasis on American thought. (3S) **Staff**

**154. Population Problems.** The nature of population growth and decline studied in reference to international, national and local social problems. Significance of present population distributions, characteristics, and trends. (3W) **Roskelley**

**156. Social Institutions.** Similarities and differences in life histories of institutions as they emerge, grow, and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. (3S) **Geddes**

**158. Human Relations in Industry.** Designed to extend understanding of the human or social characteristics involved in the operation of modern industry. The pattern of social relations that effect work behavior will be studied. (3S) **DeHart**

**160. Family Relations.** The social-emotional development of the child in the family; marital adjustment; social-culture difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60 (3S) **Skidmore**

**161. Modern Social Problems.** An approach based on adjustment to instruments of change as a means of minimizing disorganization. (3W) **Frederickson**

**162. Instructional Problems in Family Life Education.** Methods, materials, and content for teachers dealing with the social, emotional and cultural phases of Family Life Education. (3) **Skidmore**



**170. Juvenile Delinquency I.** Nature and extent of juvenile delinquency. Theories of causation and methods of prevention of delinquency in children. (3F) **Carter**

**172. Juvenile Delinquency II.** Origin and operation of the Juvenile Court. Detention, probation, placement, and institutional care, as methods of rehabilitation and correction. (3W) **Carter**

**174. Introduction to Criminology.** Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation, and methods of prevention and treatment. (3S) **Staff**

**180, 181, 182. Current Sociological Problems.** For upper division and graduate students. (1F, 1W, 1S) **Staff**

**190. Seminar in Sociology.** Time arranged. Required for majors in Sociology. (1F, 1W, 1S) **Staff**

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

**202. The Study of Society.** Basic principles of sociology are considered in their historical, theoretical and scientific settings, as a body of facts, a method of investigation, and an explanation of associative living. (5W) **Black**

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

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

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

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

**287. Methods of Social Research.** Formulating problems, collecting, analyzing, and interpreting data in social research. (3F) **Roskelley**

**301. Research Methods in Criminology.** Careful study and analysis of problems, methods, techniques, and outlook involved in criminological research. (3S) **Staff**

### DIVISION OF SOCIAL WORK

**R. W. Roskelley**, Director; **Don C. Carter**, Assistant Director; **Evelyn H. Lewis**, Assistant Professor.

**Joseph A. Geddes, W. B. Preston**, Professors Emeritus.

The demand for social workers exceeds the qualified personnel available for employment. The opportunity in social work is steadily growing, not only because the mounting complexities of modern life bring about an increasing number of personal difficulties, but because methods of constructively dealing with these difficulties are becoming more fully known. As the professional content of positions in social work has become clearer, added emphasis has been given to adequate education and training.

With the establishment of the Council on Social Work Education, in July, 1952, the graduate schools and undergraduate departments of social work joined forces with other segments of the profession to provide for more effective recruitment and training of a larger number of persons for the expanding positions in social work. Undergraduate education in social work is not regarded as a substitute for graduate training, but as the best preparation for employment in those positions for which graduate training is not required, as well as the best preparation for later under-

taking graduate study, in social work. More than 60 undergraduate departments of social work have been approved by the Membership Committee for constituent membership in the Council on Social Work Education, of which this department is a charter member.

Course requirements for a major leading to a B.S. degree in social work are: S.W. 165, 173, 175, and S.W. electives, 12 hours; Economics 127, 145, 180; Political Science 129; Psychology (9 hours selected from:) 105, 121, 140, 161, 183; Sociology (12 hours selected from:) 130, 141, 160, 161, 170, 172; Child Development 67.

During the freshman and sophomore years, students should take the following courses, in addition to filling the general group requirements for graduation: (Most of these courses may be applied towards the Social Science group requirement) Economics 51; Political Science 1, or 10; Psychology 53; Sociology 10 or 70, 40.

**162. Mental Hygiene.** Social and cultural changes that have given rise to problems of adjustment. Reactions to stress: "preventive" growth and adaptation. (3W) **Lewis**

**165. Culture and Personality.** The process of personality development, with emphasis on the influence of culture, social class, and the nature of personal experiences. (3F, S) (Not taught 1954-55) **Carter**

**173. The Field of Social Work.** Contemporary social work as it is divided into the following areas of activity: social casework, social group, community organization and social action. Objectives, processes, and personnel requirements of social work agencies. Social Work majors should take S.W. 175 concurrently. (3F) **Lewis**

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

**175. Introduction to Field Work.** Acquaints students with various agencies dealing with social work and related areas, includes field trips. Should be taken concurrently with S.W. 173. (1F) **Lewis**

**177. Social Treatment of Children's Problems.** Analysis and treatment of problems of children. (3S) **Lewis**

**178. Adolescence.** Social adjustment of the adolescent, as influenced by the nature of the culture in which he lives. (3W) (Not taught 1954-55) **Carter**

**180. Group Relations.** Analysis of group and inter-group relations and processes. Methods of group work and leadership. (3S) (Not taught 1954-55) **Carter**

**182. Children in Institutions.** Principles underlying care and treatment of children in voluntary or non-custodial institutions. Development and trends in institutional care. (3S) **Lewis**

**195. Social Work Seminar I.** A study of social work publications and other source material applicable to the field. Required of majors in Social Work. (1F) **Lewis**

**196. Social Work Seminar II.** Analysis of behavior causation and motives through use of literature and case studies. (1W) **Lewis**

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

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

**201. Social Case Work II.** A continuation of Social Case Work I. Further application of principles and methods, especially in relation to social case recording and development of skill in relationship. (3W) **Lewis**

**202. Social Case Work III.** Application of case work principles and techniques as affected by agency setting and by special types of client needs. Consideration is given to case work with children, families, aged, and the emotionally or physically ill. (3S) (Not taught 1954-55) **Lewis**

**210. Field Work I.** Field work centers are maintained in selected public and private agencies; supervision is provided under college direction. S. W. 200 should precede or be taken concurrently. (2-4F or W) (Not taught 1954-55) **Lewis**

**211. Field Work II.** A continuation of Field Work I. S. W. 201 should precede or be taken concurrently. (2-4W or S) (Not taught 1954-55) **Lewis**

**212. Field Work III.** A continuation of Field Work II. S. W. 202 should precede or be taken concurrently. (2-8S) (Not taught 1954-55) **Staff**

**222. Social Work in Rural Communities.** Social work in relation to problems of organization, administration, and community relations as they affect rural communities. (2S) (Not taught 1954-55) **Staff**

**230. Social Psychiatry I.** Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; interrelation of physical, emotional, mental and environmental factors. (2W) (Not taught 1954-55) **Staff**

**231. Social Psychiatry II.** An advanced course open only to students who have completed S. W. 230. (2S) (Not taught 1954-55) **Staff**

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

**250. Public Welfare Services I.** Development of the concept of public responsibility and its application in a modern public welfare services program; and historical development of various public welfare services. (3F) (Not taught 1954-55) **Carter**

**251. Public Welfare Services II.** Analysis of the operation of a modern public welfare services program, including: public assistance, social security, public services for children. (3W) (Not taught 1954-55) **Staff**

**260. Medical Information.** Diseases most frequently encountered in social work. Interrelations of disease and social conditions. Medical resources. (3W) (Not taught 1954-55) **Staff**

**270. Child Welfare.** Evolution and current developments in programs for meeting needs of children. Consideration is given to substitute parental care and adoptions, to child labor laws, juvenile courts, to problems of the child of unmarried parents, and the handicapped and the exceptional child. (3S) **Lewis**

**276. Contemporary Social Work Literature.** Reviews current contributions to fields of social work literature and acquaints the student with the periodical literature published during the previous year. (2W) (Not taught 1954-55) **Staff**

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

**295-296. Seminar in Social Work.** For advanced students in the Division of Social Work. Reviews the current trends and the recent literature of social work. (1-2S) (Not taught 1954-55) **Staff**

## SCHOOL OF EDUCATION

E. A. JACOBSEN, Dean

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## SCHOOL OF EDUCATION

E. A. JACOBSEN, Dean

### General Information

The School of Education, as an administrative unit of the College, includes 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.

The Bachelor of Science degree with a major in elementary or in secondary education is designed for students preparing to teach in elementary or in secondary schools. Students majoring in other departments who wish to prepare for teaching are admitted to teacher training curricula and are counseled in their programs by a committee composed of representatives of the education departments and of the departments in which teaching majors are selected. On the graduate level, provision is made for students who desire to meet requirements for administrative and supervisory credentials and for those who seek general professional advancement.

Teachers in junior and senior high schools should be prepared to teach in two high school teaching fields. The student's mastery of essential subject matter, rather than the credit hours, should determine subject matter proficiency. Teaching fields should be chosen by the student on bases 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 teaching.

The sequence of professional courses in Psychology and Education is such that it is necessary to study these subjects before the final year. A detailed plan of study is not outlined or prescribed. The student who plans to prepare for teaching usually finds 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 courses in Psychology and Education.

The School of Education is a member of the American Association of Colleges for Teacher Education.

### 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 required to register with the bureau to facilitate the compilation of the proper credentials to be used in placement for the current and future years. Registration should be completed in the winter quarter or early part of the spring quarter.

### TEACHER CERTIFICATE

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements for regular students of the College.

Certification standards conform as nearly as possible to the requirements of the State Board of Education. With the Bachelor's degree the student may qualify for any one of the following certificates:

- Teacher's Certificate for 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
- Certificate for Teachers of Vocational Homemaking in Secondary Schools

Administrative Certificates granted by the State Board of Education may be earned by graduate students.

Specific requirements for each certificate 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 especially concerned 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 and under supervision of the teacher education committee.

For training 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 especially 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 arrangement with district boards of education, facilities of their elementary and secondary schools are utilized as teacher training centers.

## Art

### FINE AND APPLIED

\*Floyd V. Cornaby, Professor and Head of Department; John C. Carlisle, Associate Director and Acting Head of the Department; H. Reuben Reynolds, Professor; Jessie Larson, Associate Professor; Everett Thorpe, Warren Wilson, Assistant Professors.

The Art Department offers major and minor courses of study in Art Education, Commercial Art, Fashion Design and Illustration, Photography, Painting, Sculpture, Interior Decoration, and Crafts. As a service unit, the Art Department is closely correlated with Home Economics, Industrial Arts, Recreation, Landscape Architecture, and other major divisions of the college.

The following courses may be repeated for additional credit: Art 4, 106, 107, 108, 109, 110, 111, 112, 113, 114, 117, 118, 130, 131, 131a, 135, 140, 145, 171, 175, 271, 272.

**Graduate Study.** Provision is made through the Art department for study leading to the Master's degree.

Students choosing to major in any of the following fields of art must show aptitude for the work and complete courses listed as follows:

\*On leave.



### Art Education

Teaching majors in secondary education are advised to complete Art 1, 2, 4, 7, 22, 106, 107, 110, 119, 124, 125, 127, 151; 9 credits in art appreciation; 9 credits in painting, and 9 credits in crafts.

Teaching majors in elementary grade supervision or special teaching of drawing or creative expression are required to complete Art 1, 2, 3, 4, 7, 106, 110, 119, 124, 125, 152; and 12 credits in painting.

Teaching majors in fine and practical arts and crafts for elementary grades are required to complete Art 1, 2, 4, 7, 106, 110, 111, 112, 113, 114, 119, and 6 credits in art appreciation.

Teaching minors in art should take Art 1, 2, 4, 7, 32, 110, 119, 124, 125, 151; 6 credits in painting. 151 or 152, and 6 credits in appreciation.

Clothing and Textile majors desiring a teaching minor in Art should complete Art 4, 111, 127, 135, 152, and 6 credits in crafts.

For Elementary Education majors who elect Art as a specialization field, Art 1, 2, 4, 7, 110, 119, 124, 125, 157; 9 credits in painting and 6 credits in appreciation are recommended.

### Commercial Art

Students who choose Commercial Art as a major are required to complete Art 1, 2, 7, 104, 106, 107, 108, 110, 117, 124, 125, 129, 132, 135, 140; and 3 credits in appreciation.

Minors in Commercial Art should take 1, 2, 4, 7, 110, 124, 125, 132 135; and 3 credits in art appreciation.

### Crafts

Majors are required to complete Art 1, 2, 4, 7, 106, 110, 111, 112, 113, 114, 119, 124, 125, 127, Woodwork 61a; 10 credits in 171; Landscape Architecture 20, and 6 credits in art appreciation.

Minors are required to complete Art 1, 2, 4, 106, 111, 112, 113, 114, 119, and 6 credits in art appreciation.

### General Art

Students desiring to major in General Art with no specialization or emphasis on teaching are required to complete Art 1, 2, 4, 7, 26, 33, 36, 106, 107, 110, 112, 119, 124, 125, 127, 132, 135, 140, and 12 credits in painting.

### Fashion Design and Illustration

Majors must complete Art 1, 2, 4, 7, 107, 109, 110, 111, 117 124, 125, 129, 132, 135; 3 credits in 171; Clothing, Textiles and Related Arts 24, 105, 115, 125, 140, and 6 credits in art history.

Minors must complete Art 1, 2, 3, 7, 110, 111, 132, 135 and Clothing Textiles and Related Arts 24, 105, 115, 125.

### Painting

Major requirements are Art 1, 2, 7, 26, 36, 106, 107, 110, 112, 124, 125, 127, 132, 140; 24 credits in painting technique such as oil, casein, watercolor, etc.

Minor requirements are Art 1, 2, 7, 26, 33, 36, 106, 107, 124, 125, 127, 132; 15 credits in painting techniques such as oil, casein, watercolor, etc.

### Interior Decoration

Majors are required to take Art 1, 2, 3, 7, 22, 26, 36, 110, 111, 123, 124, 132, 175; Landscape Architecture 3, 20, Clothing Textiles and Related Arts 24, 33; Household Administration 65; Woodwork 170, and 9 credits in art appreciation.

Minors must take Art 1, 2, 3, 7, 36, 22, 26, 111, 123, 124, and Landscape Architecture 20.

### Photography

Students desiring a minor in Photography through the Art Department are required to complete Art 1, 2, 7, 36, 107, 108, 109, 117, 129, 131, 131a, 133; Landscape Architecture 20; 12 credits in 130.

Minors are required to compete Art 1, 2, 129, 131, 131a, 132; 6 credits in 130.

### Sculpture

Major requirements are Art 1, 2, 7, 26, 33, 36, 106, 107, 110, 112, 124, 125, 127, 140; 12 credits in 171.

Minors should take Art 1, 2, 3, 7, 26, 36, 106, 107, 112, 124, 125; 6 credits in 171.

## Appreciation

**3. Art Understanding and Appreciation.** Aims to increase enjoyment of living through the sense of sight. Develops understanding of basic principles underlying the visible forms of art in everyday life. (3W, S) **Reynolds**

**26. History and Appreciation of Architecture.** Characteristics of the great styles of building and the development of a taste for good architecture. Adapted to needs of the homemaker, teacher, artist or layman. (3W) **Reynolds**

**33. History and Appreciation of Painting.** Designed for the layman desiring to extend his knowledge of the great painters before the nineteenth century, as well as for the teachers of art and artists. (3F) **Reynolds**

**36. History and Appreciation of Modern Art.** Development of modern tendencies in painting, design, architecture, crafts, sculpture, and household arts. (3W) **Cornaby**

**132. Color.** Color used in stage lighting, painting, design, and every-day life. Physical, psychological, and artistic phases are correlated. Suited to the businessman, layman, dramatist, artist, teacher, and painter alike. (3S) **Reynolds**

## Art Education

**34. Art for Young Children.** Designed to meet needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3F) **Wilson**

**151. Art Methods for Elementary Grades.** Methods of teaching drawing, painting, design and handwork in the elementary schools. Required for preparation of a grade school teacher. Prerequisite: Art 1 and 2 or 4. (3S) **Reynolds**

**152. Art Education for High School.** Methods of teaching art in high school. How to motivate work in drawing, painting, design and crafts. Required of all majors and minors in art on secondary teaching level. Prerequisites: Art 1 and 2 or 4. (3W) **Larson**

## Commercial Art

**110. Lettering-Layout.** Elementary and advanced pen and brush lettering. (3F, W, S) **Thorpe**

**135 Commercial Illustration.** Elementary and advanced fashion design, art for reproduction, advertising layouts, and the rendering of techniques in pen, dry brush, water color wash, scratch board, and pencil. (3F, S) **Thorpe**

## 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, hooked rug, tie and dye, freehand painting batik. Prerequisites: Art 1 and 2. (3F or S) **Larson**

112. **Ceramics.** Art of making pottery, tiles, figurines. (3W) **Wilson**

113. **Art Metal, Jewelry and Lapidary.** Art metal projects in hand-wrought copper, and silver, jewelry design and construction, precision casting. (3F, W or S) **Cornaby**

114. **Leathercraft.** Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (3F, W or S) **Cornaby**

119. **General Crafts.** A survey course designed to fit needs of teachers and camp counselors. Simple projects are demonstrated in leather, jewelry, art metal, textiles, plastics, clay, papier mache, and many other crafts. (3W) **Cornaby**

### **Design—Structure and Organization**

1. **Art Structure and Design.** Creative approach to line, mass, form, pattern, texture, color, and their combined relationship to design construction. (3F, W or S) **Staff**

2. **Design Creation and Application.** Problems in creating designs for application to specific projects. Instruction is adapted to the individual needs of teacher, homemaker, hobbyist, or scout, summer camp and recreational counselor. (3F, W or S) Prerequisite: Art 1. **Staff**

4. **Creative Expression.** Studio experience in developing spontaneous expression and freedom of graphic interpretation. Excellent for the layman who thinks he cannot express himself artistically, but who desires to do so. For art majors who find it difficult to interpret their inner ideas. (3W) **Larson**

7. **Freehand Drawing.** Objective drawing of natural forms from observation and memory in various media. A desirable prerequisite to all painting courses. (3F, W or S) **Staff**

107. **Advanced Drawing and Composition.** Continuation of freehand drawing. Prerequisite: Art 7. (3S) **Staff**

124. **Perspective.** The principles of cylindrical, parallel, oblique and modernistic perspective. For students of art and landscape architecture. (3F) **Staff**

125. **Anatomy.** Artistic approach to drawing human and animal anatomy. (3S) **Staff**

127. **Advanced Design.** Special problems in creating designs for furniture, leather, art metal, jewelry, ceramics, textiles, plastics, and mural decoration. For teachers, industrial artists, craftsmen. (3W) **Reynolds**

### **Graphic Art**

140. **Print Making.** Processes necessary in making transfer prints. Such methods as block printing, wood cuts, silk screen, and etching are studied. Desirable preparation, Art 7. (3F) **Wilson**

### **Interior Decorating**

22. **Essentials in Interior Decoration.** Study of historic styles and the analysis of art elements and principles of design applied to home planning and furnishing. Prerequisites: Art 1, 2. (3F or W) **Larson**

123. **Applied Interior Design.** 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. (4W, S) **Larson**

175. **Advanced Problems in Interior Decoration.** Experimental projects in home furnishing. Prerequisite: 22 and 123. (3S) **Larson**

### Painting

**108. Painting.** Introduction to the use of experimental mediums in various techniques. Desirable prerequisite: Art 7 (3F, W or S) **Staff**

Section A. Oil Painting, General

Section B. Mural Painting

Section C. Portrait Painting

Section D. Watercolor

Section E. Casein

Section F. Plastic Painting

### Photography

**129. Photography.** Basic course dealing with problems of camera technique, exposure, negative processing, lighting, light meters, contact printing, enlarging, copy work, print quality, slide making, and use of filters. (3F) **Reynolds**

**130. Advanced Photography.** Advanced problems in composition, texture study, lighting, portraiture, landscape, and related problems based on interests of student. (3W) **Reynolds**

**131. Color Photography.** Problems in color; Ektchrome and Kodachrome, use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32. Two lectures, three labs. (5S) **Reynolds**

**131a. Abstract Composition.** Symbolic interpretation, texture studies, symbolism in portraiture, table-top technique, negatives combined with photograms, solarization and multiple exposure, and other techniques used in modern advertising and illustration. Two lectures, three labs. (5S) **Reynolds**

### Sculpture

**106. Sculpture.** Creative expression in a variety of plastic media. Emphasizes esthetic employment of form and the technique necessary to casting, built up plaster modeling, beating metals, stone cutting, and wood carving. (3F or S) **Wilson**

### Special Art Problems

**171, 271. Special Studio Courses.** Individual work on specific problems. Art majors desiring work in Art 171 are required to take Art 1 and Art 2 as prerequisites. All criticism, assignments and supervision are given on Fridays at a time arranged between student and instructor. Student must secure permission of instructor.

From one to five credits a quarter may be taken.

**272. Art Research and Special Problems.** Credit arranged. (F, W or S) **Cornaby**

### Education (Administration)

E. A. Jacobsen, Professor and Chairman; John C. Carlisle, L. G. Noble, Professors; Jefferson Eastmond, Keith Oakes, Ben Van Shaar, Assistant Professors.

**10. College and Life.** Orientation course for freshmen but open to all students. (2F, W or S) **Staff**

**50. Introduction to Teaching.** Study of qualifications essential to teaching success and to each student's aptitudes for teaching. Required of all candidates for teaching training curricula. (2F, W, S) **Staff**

**114. Organization and Administration.** Fundamental principles of operating public schools, with emphasis on Utah conditions. (3F or W) **Van Shaar**

**116. Articulation of the Educational Program.** A survey of existing needs for close articulation of the various educational units and agencies. Discussion of factors conditioning nature and extent of articulation and of the unifying principles upon which a well-articulated education program rests. (3F 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.** The importance of finances in a school system; principles and practices involved in collecting and distributing school revenues, with special reference to conditions in Utah. (3F) **Eastmond**

**182. History of Education.** Major educational movements from early Greek to the present with emphasis on purposes, organization, instructional procedures, curriculum, etc., and their bearing on today's education. (3 Su. First) **Oakes**

**190, 191, 192. Intercultural Education.** A sequence of courses planned in co-operation with other departments to acquaint prospective teachers with ways and means of studying the culture of other peoples in elementary and secondary schools. (1F, 1W, 1S) **Carlise and Staff**

**160. 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) **Oakes**

**203. Comparative Education.** Educational problems of Europe, Latin America, the Middle East, Far East, and Russia. Students from foreign lands and resident faculty members personally acquainted with various educational programs are utilized as resource persons. (3W) **Oakes**

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

**211. Educational Measurements and Statistics.** Principles of measurements, tests and test construction, statistical analysis, and evaluation procedures in education. (3W) **Eastmond**

**213. Organization and Administration of Guidance.** (See Psychology 213). (3S) **Oakes**

**215. Curriculum Development.** Advanced problems in the foundation of curriculum building. Philosophic bases of the curriculum, current practices, and organization for curriculum study. (3S) **Carlisle**

**218. Public Relations in Education.** Objectives and techniques and media for an improved school public relations program are listed and evaluated. (3F) **Eastmond**

**221. School Administration.** The work of the school administrator and the principles upon which the profession of school administration is practiced. Federal, state, and local relations to education are studied. (3W) **Oakes**

**222. Administration of School Personnel.** Principles and practices in management of teacher and pupil personnel. (3S) **Jacobsen**

**223. Legal Aspects of School Administration.** Emphasis is given to responsibilities and functions of local and district school administrators with interpretation of legal status, form, and procedure as established by statutes, legal opinions, and court decisions. (3F) **Oakes**

**247, 248, 249. Education Seminar.** Opportunity for investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. (1F, W or S) **Staff**

251, 252, 253. Master's Essay. Individual guidance in preparation of research papers as part of research requirement for the Master of Science degree.

255. Programs, Plans, and Construction of School. School housing surveys, location and capacity of schools, instructional needs as a basis for planning, standards for equipment, checking plans and specifications, business and legal provision governing financing and construction of new buildings, bids and contracts. (3S)

Oakes

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. Individual work in thesis writing with necessary guidance and criticism. Credit arranged. (F, W or S)

Staff

275. Field Studies and Thesis. Individual work on research problems applying on the program of the Ed.D. Credit arranged. (F, W, S)

Staff

## Education (Elementary)

Caseel Burke, Associate Professor and Chairman; Edith Shaw, Assistant Professor; Ellen Humphrey, Fern Nicholes, Myrtle Jensen, LaRue Parkinson, Constance Nielson, LaMar Oleson, Thomas Taylor, Jean Pugmire, Instructors.

In connection with 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 science, biological science, physical science 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 I.	Understanding the Child—Minimum 9 credits: Psychology 105, 123, 145, 181, 182, 183, Physical Education 84, Public Health 155, Speech 107, Child Development 67.
Group II.	Understanding the School—Minimum 6 credits: Education 103, 114, 116, 141.
Group III.	Curriculum and Methods—Minimum 12 credits: Education 104, 105, 107, 108, 109, 161, Psychology 108, 127, English 24, Speech 118, Music 130, Art 152, Physical Education 177, 182, Child Development 174.
Group IV.	Student Teaching—Minimum 12 credits: Education 106, Child Development 175.
Group V.	Electives—may apply on 45-credit major: Psychology 161, 140, 112, Education 110, 145, 165, 181, 194, 203, 205.

Selection of the program of study should be guided by 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. Part of the work of the course is observation and analysis of practices and procedures in selected elementary schools near Logan. Two hours of observation weekly. Time arranged. (4F, W, S)

Burke



**104. Elementary School Curriculum.** Familiarizes prospective elementary teachers with the nature and content of the elementary curriculum and factors that influence its development. Includes an introduction to Utah Elementary Teaching and Supplements, and considers some of the objectives, methods of instruction, teaching aids and materials, and sources of information related to the subjects of the curriculum. (3F, 3W, 3S) Jacobsen

**105. Principles of Teaching in Elementary School.** The purposeful activity of the child as the basic principle determining teaching procedure. Significance of individual differences in application to school room practices. Consideration of schoolroom equipment and of organization and play activities. (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 responsibilities but with gradual increase of work and responsibility as trainee's ability is demonstrated. Registration for all quarters should be arranged at fall quarter registration. Any quarter, time arranged. Students who have credit for other courses in practice teaching, or who have successful teaching experience, may register, by special permission of the instructor, for less than 12 credits. (F, W or S)

Shaw and Supervising Teachers

**107. Teaching of Reading.** Considers the objectives of the reading program, stages of reading development, skills and attitudes to be gained, the materials of instruction, and the experiences of children that contribute to achievement of the objectives of reading. (3F) Burke

**108. Social Studies in the Public School.** Social responsibilities and opportunities of youth in the modern world. Emphasizes the part played by the school and the teacher in helping children meet problems of living. Content and methods on both elementary and secondary levels. (3W) Burke

**109. Arithmetic and Science in the Elementary Grades.** Investigation of the aims of the arithmetic and science programs and an acquaintance with the materials, techniques of instruction, and experiences of children that may help them gain the skills, understandings and attitudes desirable in these subjects. (3S) Burke

**110. Diagnostic and Remedial Teaching.** Specific objectives of the elementary school and methods of analyzing the extent to which these objectives are reached. Diagnostic and remedial measures with respect to various areas of the curriculum. (2S) Staff

**207. Elementary School Administration.** The operation and management of the elementary school. (3W) Burke

**208. School Supervision.** The principles and practices of school supervision including the qualifications and responsibilities of the supervisor in elementary education. (3S) Burke

**245. Problems in Elementary Education.** Consideration given those fields of elementary education that members of the class desire to investigate in order to gain modern authoritative viewpoints. Opportunity for both individual and group work. (2S) Burke

## Education (Secondary)

John C. Carlisle, Professor and Chairman; L. G. Noble, Professor; Helen Cawley, Keith Oakes, Associate Professors; Dale O. Nelson, Assistant Professor; Pearl S. Budge, Instructor.

For a major in Secondary Education the student must complete at least 36 credits of professional work in Education and Psychology. The major course 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, 116, 141.
- (3) Fifteen credits in student teaching, methods and curriculum: Education 111, 127, 129, 130, 107, 108, 161, 162, 164; Art 154; English 124; Speech 123; Secretarial Science 179 or 180; Music 121, 122 or 123; Physical Education 130, 160, 163; Mathematics 150.

Note: Courses in group (3) above other than Education may be elected only by students having teaching majors in the specific fields indicated.

Students majoring in other departments who wish to complete only the requirements in Secondary Education for a Utah teaching certificate must complete the total of 30 credits distributed according to the above groups plus an additional three credits of elective work in Education or Educational Psychology.

A teaching major of not fewer than 36 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 fewer than 60 credits in two or more related subjects with a minimum of 18 credits in any field included in the composite major. 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 teacher certification in 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 status of the American secondary school. Problems concerning desirable objectives and functions are analyzed. An introduction to various type curricula and methods is included. (5F, 5W, 5S) **Carlisle**

**113. Principles of Guidance.** Major emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (5F, W or S) **Van Shaar**

**119. Extra-curricular Activities.** Designed to acquaint prospective teachers and administrators with extra-curricular programs in secondary schools, and the place such activities occupy. (5S) **Staff**

**123. Teaching of Speech.** The methods and problems peculiar to teaching Speech. Organization of courses and lesson plans is included. Students may register only with permission of instructor. (2F) **Myers**

**124. 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**

**127. Secondary School Methods.** Teacher personality, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, testing and evaluation, are all included. Recommended to be taken the same quarter with Ed. 129. (3F, 3W, 3S) **Carlisle; Budge; Oakes**

**129. Student Teaching in the Secondary School.** Required for certification. Students may enroll only after completing Psychology 102, Education 111, and at least 18 credits in the subject which they expect to teach. Education 127 should be taken during the same quarter. At least one period per day is required, 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 Ed. 129 and 130, the student has had guided experience in all professional responsibilities of the typical faculty members in the high school. (4F, 4W, 4S)

**Carlisle; Budge; Oakes; Nelson**

**130. Student Teaching in the Secondary School.** Must precede Educ. 129 or be taken concurrently with it. (4F, 4W, 4S) **Carlisle; Budge; Oakes; Nelson**

**138. Improvement of Teaching in Secondary Schools.** Designed to meet the needs of teachers, supervisors, and administrators. Emphasis upon recent developments in the improvement of teaching learning situations and activities from the junior high school to the junior college. (3F) **Carlisle**

**150. Teaching Mathematics.** Objectives in teaching mathematics in elementary and secondary schools, and materials and methods most conducive to attaining these objectives. (3S) **Tingey**

**151. Art Education for High School.** Methods of teaching art in the secondary school. Motivation of 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. (2W) **Staff**

**161. Audio-Visual Aids in Education.** Studies the building of a workable program in which the newest materials and techniques are utilized. (3F, 3W, 3S) **Drake**

**179. Methods of Teaching Typewriting.** Recent development and practice in teaching typewriting. For students preparing to teach and those engaged in teaching who wish to make their teaching more effective. (3F) **Neuberger**

**180. Teaching Shorthand.** New methods and trends in teaching shorthand, and observation and practice in shorthand classes for those preparing to teach. (Consult instructor before registering.) (3F) **Doty**

**236. Secondary School Administration.** Topics in secondary school administration are considered, including problems of teacher-pupil personnel, the principal as supervisor, and managing the activity program. Designed for experienced school principals, and those preparing for the administrator's certificate in secondary education. (3W) **Carlisle**

**237. Problems in Secondary Education.** For graduate students in secondary education and those preparing for school administration or supervision in the junior or senior high schools. Reviews current research in areas of special interest to class members. (3F) **Carlisle**

## Education (Vocational)

**S. S. Richardson**, Professor and Chairman; **L. Mark Neuberger**, Professor; **Helen Cawley**, Associate Professor; **Eldon Drake**, Assistant Professor.

Candidates for a teacher's certificate in any branch of Vocational Education must comply with Utah certification requirements. The following courses are suggested:

**Agriculture Basic:** Psychology 102; Education 112, 113, 114, 125, 126; Public Health 155; Elective, 3 credits.

**Home Economics Basic:** Psychology 102; Education 114, 120, 121, 122; Bacteriology 155; Public Health 155; Elective, 7 credits.

**112. Principles of Vocational Education.** Social and economic bases for vocational education and its relation to general education. Fundamental principles and practices in vocational education. (3W) **Richardson**

**120. Methods in Teaching Home Economics.** Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102. (3F or S) **Cawley**

**121. Problems in Teaching Home Economics.** Recent investigations in Home Economics and their bearing upon Home Economics curricula and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) This

course should be blocked with Education 122 and with one other 3-hour Education course so that concentrated work may be taken on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W, S) Cawley

**122. Student Teaching in Home Economics.** Observation and teaching of homemaking under supervision in public schools having co-operative arrangement with the College. Student teachers leave the campus the middle five or six weeks of Faall or Winter Quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122, preferably at the beginning of her junior year, to make arrangements for teaching at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8F, W, S) 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. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4S) Cawley

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

**125. Methods of Teaching Agriculture.** Fundamental principles and practices of teaching agriculture, selection and organization of subject matter, and supervision of agricultural activities on the farm. (5W) Richardson

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

**194. Principles and Objectives of Distributive Education.** To acquaint students with the general philosophy and purposes of vocational distributive education, and to enable them to understand and appreciate its place in the modern education program. Students compare the principles and objectives of distributive education with those of other educational programs. Arr. Staff

**195. Part-time Distributive Education.** The content, methods and devices to be used in part-time education program. Emphasis placed on problems of co-ordination, selection of students, arrangement of a class schedule, supervision on the job, and other phases of the co-operative part-time distributive education program in the high school. Requirements and standards of part-time vocational education will be treated. Arr. Staff

**199. Special Problems in Home Economics Education.** Developed around individual needs of students which are not otherwise provided for in curriculum. (1-2F, W or S) Cawley

**210. 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) Richardson

**226. Young Farmer and Adult Classes.** Fundamental concepts in organization and instruction of young farmers and adults; principles and techniques of teaching classes. (3S) Richardson

**237. Seminar. Home Economics Education.** Opportunity for investigation and reporting on individual problems. (Time and credit arranged) Cawley

### Graduate Work

Graduate study in the Departments 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 Education 103, 104, 105, 106, 113, 114, 129, 130.

### Library Science

**King Hendricks**, Professor and Chairman; **Milton Abrams**, **Russell Davis**, **Leone Harris**, **James Tolman**, Assistant Professors; **George Beutler**, **Ann Caine**, **Pearl Carter**, **LaPrele Hatch**, **Ida Marie Logan**, Instructors; **A. M. Smith**, Lecturer in Library Science

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 fewer than 30 credits or a minor of not fewer than 18 credits must represent credits selected from each of three groups of courses including courses marked °.

Group 1: Technical processes: 1, 113, 120°, 121; Eng. 111; Educ. 161; Art 110.

Group 2: 100°, 155°, 156, 160; Eng. 23, 24, 40; any upper division course in Literature; Speech 18; Educ. 107.

Group 3: Administration 150°; Educ. 104, 105; Psychology 110.

The courses required for an Elementary library certificate are English 24, L. S. 120, and L. S. 150; for a high school library certificate: L. S. 120, L. S. 150, and L. S. 155.

**1. Library Procedures.** Designed for library employees. Procedures and techniques of library operation including circulation, reserve, and all branch libraries. Open to prospective employees of the library and required of all student employees of the library. Restricted to 20 and open to freshmen and sophomores upon consultation with instructor. (2F, W, S) **Davis; Harris**

**100. Reference Materials and Bibliography.** Principal reference tools in each field. Reference materials for school, public, and college libraries. (3W) **Davis**

**103. Bibliographic Research in Education.** Technical reference materials, including bibliographies, abstracts, and technical journals, in education. (1F, W) **Logan**

**104. Bibliographic Research in Commerce and Business Administration.** Technical reference materials peculiar to Commerce and Business Administration, including indexes, bibliographies, abstracts and technical journals. (1F or W) **Staff**

**105. Bibliographic Research in Forestry.** Technical reference materials peculiar to Forestry, including indexes, bibliographies, abstracts and technical journals. (1W) **Tolman**

**106. Bibliographic Research in Agriculture.** Technical reference materials peculiar to Agriculture, including indexes, bibliographies, abstracts and technical journals. (1F, S) **Tolman**

**107. Bibliographic Research in Engineering.** Technical reference materials peculiar to Engineering, including indexes, bibliographies, abstracts and technical journals. (1F or W) **Davis**

**108. Bibliographic Research in Home Economics.** Technical reference materials peculiar to Home Economics, including indexes, bibliographies, abstracts and technical journals. (1F or W) **Staff**

**113. Book Repair and Binding.** Methods of book repair, necessary bindery records, and the history of book binding. (2S) **Beutler**



**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) **Davis**

**121. Second Quarter Cataloging and Classification.** A continuation of Library Science 120, which is prerequisite to this course. (3W) **Davis**

**150. School Library Administration.** The theory of school library work with emphasis on demonstration and practical application. (3S) **Harris**

**155. Book Selection.** Methods and principles of book selection and book ordering. (3S) **Smith**

**156. School Library Problems.** Reading in professional library literature on current issues of librarianship, related especially to the school library. (2F) **Smith**

**160. Art of the Book.** The history of bookmaking and printing. (2W) **Tolman**

## Music

### Instrumental Music Division

**N. Woodruff Christiansen**, Professor and Chairman, Instrumental Division; **Walter Welti**, Professor and Chairman, Vocal Division; **John Philip Dalby**, Band, Professor; **George Pahtz**, Instructor; **Mischa Poznanski**, Instructor.

**Instrumental Music Majors.** Students may work in the field of Music Education or applied music.

#### I. Requirements for departmental endorsement to teach band and/or orchestra.

##### A. Fill professional requirements for certification.

##### B. Core requirements, 26 hours.

Music 74, 75, 77, 88, 89, 176

Three hours to be chosen from Music 1, 80, 81, 90.

##### C. In addition to core requirements

Music 106, 120, 121, 122, 123, 170, 171, 173.

Performing groups.

##### String Instrument Majors

Orchestra ..... 13½ hours.

Minor instruments ..... 4½ hours.

##### Wind Instrument Majors

Band ..... 13½ hours.

Minor instruments ..... 4½ hours.

Performance: Students must pass departmental examination on one major and two minor instruments, voice, and piano.

#### II. Majors in Applied Music

##### A. Piano

1. Meet core requirements (See B above)

2. Private instruction or equivalent 18 hours

3. Piano instruction or equivalent 4½ hours

4. Music Electives 12 hours

5. Present a public recital with a program approved by the department.

6. Pass a departmental examination in sight reading.

##### B. Major performing instrument other than piano

1. Meet core requirements

2. Private instruction or equivalent 18 hours

3. Piano instruction or equivalent 4½ hours

4. Ensemble playing 4½ hours

5. Music Electives

6. Present a public recital and pass an examination in sight reading as piano.



**10, 11, 12. Band and Orchestra Instruments.** An individual study of minor instruments only. No fee. 10—Brass and Percussion, 11—Woodwinds, 12—Sec. 1, Sec. 2 Strings. One credit. (F, W, or S) **Staff**

**15, 115. String Orchestra.** Composed of capable string players performing as a group. Music specially arranged for a large string group is used. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Pahtz**

**18, 118. 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. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Christiansen**

**41, 141. Marching Band.** Open to all students who play band instruments. Rehearsals and drill for presentation of shows for athletic events. Attendance at all public appearances of band required. ( $\frac{1}{2}$ F) **Dalby**

**42. Military Band.** Open to men students enrolled in ROTC Basic. Band drill and rehearsal. Fall quarter Military band combined with Marching band meets daily. Winter and Spring quarters band meets twice weekly. All military band students excused from 1 hour military drill period each week. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Dalby**

**43, 143. Symphonic Band.** Study and preparation of modern symphonic band literature. Public performances and concerts. Permission to register must be obtained from instructor. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Dalby**

**44, 144. Wind Ensembles.** Brass quartets, sextets and woodwind trios, quartets or quintets. Members are selected from applicants. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Pahtz**

**71. Development of String Literature.** A historical study of literature for string instruments from Corelli to the present time. Demonstrations of concert numbers. (2F, 2W, 2S) **Poznanski**

**74, 75. Diatoni and Keyboard Harmony.** Chord progressions and melody writing up to and including seventh chords. Form and analysis. (4F, 4W) **Christiansen**

**77. Counterpoint.** Elementary study of counterpoint based on style of 16th Century. Prerequisite Mus. 74, 75. (4S) **Dalby**

**\*80. Opera Appreciation.** Study is made of the world's best operas. Particular attention is given to development of the orchestra as an essential of the opera. By means of recordings, the choicest musical selections are learned. (2F, 2S) **Christiansen**

**\*81. Symphony Appreciation.** Complete symphonies are played from recordings. Study is made of their form and content. Biographical sketches of composers. (2W) **Christiansen**

**84, 184. String Ensembles.** Offers opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Standard literature is studied. ( $\frac{1}{2}$ -1F,  $\frac{1}{2}$ -1W,  $\frac{1}{2}$ -1S) **Pahtz**

**87. Composition.** Study of simple forms in original compositions. Prerequisites: Music 74-75-77. (W, S) Credit and time arr. **Dalby**

**88-89. Melodic and Harmonic Dictation.** Transcribing simple melodic and harmonic studies to develop ability to hear and interpret written music. 2 lab. hours per week. Arr. (2W, 2S) **Dalby**

**\*90. Music in General Culture.** A non-technical course aiming to increase the enjoyment and understanding of potential music lovers. Primarily for non-music majors, but open to all interested persons. (3F, 3W, 3S) **Christiansen**

**120. Secondary School Music Methods.** Teaching and administration of all phases of the music program in the secondary schools. Required of all Secondary Music Education Majors. (3W) **Staff**

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\*Language Arts Group.

**121, 122, 123. Instrumental Methods.** Technical study of various instruments to prepare student to understand and teach the fundamentals of playing them. Weekly discussion of general band and orchestra problems. Required of all teaching majors in instrumental music. Open to other students. Fall, brass and percussion; Winter, woodwind and saxophone; Spring, string instruction. (3F, 3W, 3S)

Dalby; Poznanski

**170, 171. Instrumentation and Arranging.** Study of each of the standard instruments in use today, their use in small ensembles and large heterogenous groups. Scoring and arranging for band and orchestra. (3W, 3S)

Dalby

**173. 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: Music 114. (2S)

Christiansen

**176. Chromatic Harmony.** The study of chord embellishments. Analysis of corresponding musical literature. Composition in small forms. (4S)

Christiansen

**187. Composition.** Continued study in composition for advanced students. Writing for large vocal and instrumental groups. Prerequisite: Music 87, 170, or 171. (W, S) Time and credit arranged.

Dalby

**300. Thesis.** 5-10 credit hours.

Staff

### PRIVATE INSTRUCTION COURSES

**N. Woodruff Christiansen**, violin; **Walter Welti**, vocal; **John Philip Dalby**, brass; **George Pahtz**, cello. Instructors: **Mischa Poznanski**, violin. Brass and woodwind instruments: **Max Dalby**; **Eldon Torbensen**. Vocal: **Maxine Greenwood**, **Patience Thatcher**. Piano: **Lucy L. Christiansen**; **S. E. Clark** (and organ); **Thelma Lundquist**; **Laverne Odd**; **Irving Wassermann**; **Jeanne T. Welti**.

The following courses are given through private study only. Appointments must be arranged with the instructor selected. For fees see "Student Fees."

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 is given students of junior standing provided they have had at least two years, or equivalent, of previous study.

**50P, 150P. Piano, Fundamental and Advanced Techniques.** A study of music suited to the ability of the performers.

Staff

**53P, 54P, 55P, 153P, 154P, 155P. Vocal.** See statement for piano.

Staff

**56P, 156P. Wind Instruments.** See statement for piano.

Staff

**60P, 160P. String Instruments.** See statement for piano.

Staff

**66P, 166P. Pipe Organ.** See statement for piano.

Clark

### Vocal Music Division

Music students desiring to major in this Division are required to attain proficiency either in singing or in playing the piano. In addition, for those who plan to teach, the following comprehensive program is recommended:

Music 3, 4, 5; 74, 75; 121, 122, 123; 131, 132; 106; 114; plus at least nine hours in choral activities either as singer or accompanist.

Students desiring to major in applied music must attain recital capacity in voice or piano. In addition, the following courses are required:

Music 1, 3, 4, 5; 74, 75; 106, 114; at least six hours in choral activities either as singer or accompanist.

## COURSES OFFERED

**\*1. Music Appreciation.** Examples of early and modern music, from song form to opera and symphony, with biographical and historical comments and observations. (3F) **Welti**

**\*3. Music Fundamentals.** A basic approach to music study, dealing with notation, rests, keys, scales, intervals, major and minor modes. Recommended in preparation for Mus. 74, 75. (3F) **Welti**

**\*4. Reading Music.** This next step following Mus. 3 is reading music, beginning with simple and familiar intervals, and familiar songs; "hearing with the eye." (3W) **Welti**

**\*5. Melodic and Harmonic Dictation.** Follows Music 4. Developing ability to write down music as heard: "seeing with the ear." (3S) **Welti**

**24. Chorus.** Open to all students with a normal singing voice. Auditions to determine the part to be sung are announced at rehearsal. A program is prepared and presented during the quarter.

(Sec. 1, Men, M. W. F. 12) (Sec. 2, Women, T. Th. F. 12) (F1) **Welti**

**25. Opera Chorus.** The chorus is trained to perform in the College Opera. Auditions are conducted intermittently to determine progress.

(Sec. 1, Men, M, W, F 12) (Sec. 2, Women, T, Th, F 12) Both sections have one additional rehearsal per week. Arr. (2W) **Welti**

**26. Chorus.** A cantata or oratorio is prepared and presented. (Sec. 1, Men, M, F, W 12) Sec. 2, Women, T, Th, F 12) (1S) **Welti**

**35, 36, 37. Small Ensembles.** Opportunities for good voices to organize into small groups. See instructor before registering. (1F, 1W, 1S) Arr. **Welti**

**106. Music History.** Music's place in history from antiquity to present. Lives of eminent contributors to development of music as a science and an art. (Not open to freshmen) (3S) **Welti**

**114. Choral Conducting.** Methods, materials and techniques of developing choruses; use of baton; style in expression; care of voice. (Not open to freshmen) (3F) **Welti**

**124, 125, 126. Meistersingers.** A selected group of men singers. Admission by audition only. Auditions are conducted at first and second rehearsals. Limited registration. No credit for less than two consecutive quarters. (1F, 1W, 1S) **Welti**

**127, 128, 129. Opera Staging.** Competitive auditions are announced and parts assigned early in Fall quarter. Auditions are open to all students. Those selected are required to register for credit in winter quarter. (W3) Arr. **Welti**

**130. Elementary School Music for the Classroom Teacher.** Application of music to the elementary classroom. Problems, methods and materials in singing; rhythm, creative music, reading, and appreciation. Prerequisite: Mus. 3. (W3) **Staff**

**132. Secondary School Music Methods.** Principles, practices, materials and problems in Junior and Senior High School. Prerequisites: Mus. 3, 4. (3S) **Staff**

**135, 136, 137. Chansonettes.** A selected group of women singers. Admission by audition only. Auditions are conducted at first and second rehearsals. Limited registration. No credit for less than two consecutive quarters. (1F, 1W, 1S) **Welti**

**138-139. Opera Production.** Practical study of details involved in production of opera. Students enrolled become members of the production staff, and are assigned specific tasks. (2W) **Welti**

\*Counts in language arts group requirements.

214. **Special Problems in Music Education.** Independent study of chosen problems in Music Education,, developed around individual needs. Time and credit arr. **Welti**

300. **Thesis.** Time and credit arr. **Welti**

## **Physical Education and Recreation**

**H. B. Hunsaker**, Professor and Head of Department; **Israel C. Heaton**, **Lois Downs**, Associate Professors; **Dale O. Nelson**, **Helen I. Clark**, **Ray Watters**, **Pauline Fuller**, Assistant Professors.

### **INTERCOLLEGIATE ATHLETIC STAFF**

**John Roning**, Professor, Director of Athletics; **Cecil Baker**, Associate Professor; **Everette Faunce**, **Calvin C. Stoll**, **Ralph Maughan**, Assistant Professors; **George Nelson**, **Gordon Porter**, Instructors.

### **SERVICE COURSES**

In the service courses, opportunity is given each student to perfect skills in some physical activity that will help establish a permanent interest in healthful recreation both active and passive, the promotion of physical fitness, the building of morale, and the maintenance of health.

A physical examination is given each student at the beginning of each year to advise him properly about the type of activity best suited to his individual needs.

Women students are required to take physical education service courses for six quarters. Classes may be selected by the student; no course may be repeated for credit. Before a student may enter an intermediate 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.

All male students should take some activity course in Physical Education. Numerous 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 part of the program of the Department of Physical Education and Recreation. The Women's Athletic Association, in co-operation with the women's division of the department, sponsors and offers a widely varied program of activities. All women students are eligible and encouraged to participate in any or all of the sixteen activities 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 separate leagues, fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues.

The intramural program is planned to give every student moral, social, physical, and educational values derived from competitive athletics. This program of athletics provides for both individual and team endeavor. "Athletics for all" is the purpose of the intramural sports program.

### **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 activity. After taking courses in this department, students should be so interested in recreation that they will be a valuable aid to any community.

Awards are given to managers of various recreational groups; individual awards are given for special achievement. Groups are organized in hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and square dancing.

### Professional Study in Health, Physical Education and Recreation

The Department of Physical Education and Recreation offers major study with specialization in the following areas: Physical Education, Elementary Physical Education, Secondary Physical Education Certification, Recreation, Health, Dance, Professional Scouting, and Physiotherapy. A composite major including two of the above areas may be taken to meet the major-minor requirement. Selection of a study program in the above areas should be carefully worked out under the guidance of the student's adviser. The following courses, in addition to the six credits required for graduation, are suggested for each of the above areas:

Non-certifying Physical Education Majors should complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 83, 84, 85 or 92, 106, 181, 183; six credits in Sports Techniques, and ten credits of approved electives.

Elementary Physical Education Majors should complete Physical Education 24, 55, 75, 81, 83, 84, 85 or 92, 160, 177, 181, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.

Secondary Physical Education Men Majors should complete the following:

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
P. E. 20, 21, 22 .....	1	1	1	P. E. 30, 31 .....	1	1	...
P. E. 75 .....	2	...	...	*P. E. 74 .....	...	...	2
*P. E. 17A, 18 .....	...	1	1	P. E. 85, 84, 83 .....	3	3	3
M. S. ....	1	1	1	Eng. 10 .....	5	...	...
Group Req. ....	5	10	10	Ed. 50 .....	...	2	...
Electives .....	7	3	3	M. S. ....	1	1	1
				Minor .....	...	3	3
				Group Req. ....	5	5	5
				Electives .....	2	2	2
	16	16	16		17	17	17

The following courses may be taken  
any quarter during the year indicated

Junior				Senior			
Course	F	W	S	Course	F	W	S
P. E. 120, 121, 122 .....	2	2	2	P. E. 130, 131, *132 .....	2	2	2
P. E. 188, 189, 190 .....	2	2	2	P. E. 183 .....	3	...	...
P. E. 106, 181 .....	5	3	...	P. E. 192 .....	...	3	...
Ed. 111 .....	3	...	...	P. E. 184 .....	...	...	3
Psy. 102 .....	...	5	...				
Ed. 114 .....	...	...	3	PH .....	3	...	...
Eng. 110 .....	...	...	4	Ed. 127 .....	...	3	...
Minor .....	3	3	3	Ed. 129 .....	...	4	...
Electives .....	2	2	2	Ed. 130 .....	...	4	...
				Minor .....	6	...	3
	17	17	17	Elective .....	3	...	8
					17	16	16

\*Courses taught more than one quarter each year.

Secondary Physical Education Women Majors should complete the following:

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
P. E. 75 .....	2	---	---	P. E. 81, 83 .....	3	---	3
P. E. 20, 21, 22 .....	1	1	1	P. E. 92, 84 .....	---	3	3
P. E. 24, 26 .....	1	---	1	P. E. 77, 78, 79 .....	1	1	1
P. E. 98 .....	---	---	1	P. E. 94, 95, 96 .....	1	1	1
*P. E. 17A .....	1	---	---	*P. E. 74 .....	---	2	---
*P. E. 18 .....	---	1	---	Eng. 10 .....	5	---	---
Group Req. ....	5	10	10	Ed. 50 .....	---	2	---
Electives .....	6	4	4	Group Req. ....	5	5	5
				Electives .....	2	3	3
	16	16	17		17	17	16

The following courses may be taken  
any quarter during the year indicated

Junior				Senior			
Course	F	W	S	Course	F	W	S
P. E. 106, 181 .....	5	3	---	P. E. 160, 161, 162 .....	2	2	2
P. E. 120, 121, 165 .....	2	2	2	P. E. 183, 192, 184 .....	3	3	3
P. E. 132 .....	---	---	2	P. H. 155 .....	3	---	---
P. E. 150 .....	---	---	4	Ed. 127 .....	---	3	---
Ed. 111 .....	3	---	---	Ed. 129 .....	---	4	---
Psy. 102 .....	---	5	---	Ed. 130 .....	---	4	---
Ed. 114 .....	3	---	---	Minor .....	6	---	3
Eng. 110 .....	---	---	4	Electives .....	3	---	8
Minor .....	3	3	3				
Elective .....	---	3	3				
	16	16	17		17	17	16

Recreation Majors should complete Physical Education 3, 17A, 18, 74, 75, 83, 84, 85, 153, 157, 179, 183, 196; three credits in Sports Fundamentals, four credits in Sports Techniques, and 12 credits in the related fields of sociology, arts and crafts, music, drama, and photography.

Health Education Majors should complete Physical Education 55, 84, 145, 181, 183, 184; Public Health 15, 50, 151, 152, 153, 156, and Psychology 145 or Sociology 162 or Social Work 165, and 12 credits from approved electives.

Dance Majors should complete Physical Education 72, 76, 81, 83, 84, 102, 103, 104, 106, 111, 140, 150, 151, 153, 183, 184, and six credits of approved electives.

Students planning to go on to a Physiotherapy School should complete Physical Education 17A, 18, 55, 74, 75, 83, 84, 106, 180, 181, 183; four credits in Sports Fundamentals and four credits in Sports Techniques, and 12 hours from approved electives. Physiotherapy students should work closely with the adviser in selecting courses to fill groups and minor requirements.

### Master of Science Degree in Physical Education

The Department of Physical Education and Recreation offers courses leading to the Master of Science degree in physical education or recreation. Before admission to candidacy for the degree, a student must complete the equivalent of a Bachelor's Degree in physical education at Utah State Agricultural College and additional requirements as prescribed by the graduate school. Required courses are P. E. 192, 250, 271, 295, 299, Ed. 267, Eng. 211.

Students entering the department for graduate study should select supporting fields from one or two other areas of the school, closely allied to physical education and recreation, from which graduate courses will be selected. Suggested areas and courses are:

Education 201, 211, 219, 221, 230, 237.

Health 160, 166, Bact. 144, 151, 156, 168, 201.

Sociology 141, 152, 154, 160, 170, 172, 202, 222, 240, 250, 270, 280.

Psychology 107, 110, 140.



## INTERCOLLEGIATE ATHLETICS

Utah State Agricultural College is a member of the Mountain States Conference, which also includes Montana State University, University of Utah, Brigham Young University, University of New Mexico, University of Denver, Colorado A & M College, and University of Wyoming.

The Conference authorizes competition in football, basketball, baseball, track, wrestling, swimming, skiing, tennis, golf, cross country, hockey and gymnastics. The college is represented in the Conference organization by a Faculty Representative and the Director of Athletics. On the campus the intercollegiate athletics are administered by the Director of Athletics. A faculty council, on which the student body and alumni have representation, has responsibility for the conduct of the program, the scheduling of all contests and the academic standing of all athletes.

Every student in the college is given opportunity to try out for various teams. Students who participate enough to earn a letter receive the college block "A" award and, according to his sport, a sweater, blanket or some other trophy.

Every student is given opportunity to try out for the various teams. Attractive schedules with teams from other colleges are arranged in football, basketball, track and field, baseball, swimming, wrestling, tennis, golf and skiing. The College has an attractive Stadium for football, track, and field sports. The Field House seats 7500 people for basketball games and 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.

## COLLEGE HEALTH SERVICE

The Health Service is maintained primarily for care of students who may become ill during their stay on the campus. This service also functions as an educational department by teaching preventive medicine and hygiene. Through consultations, examinations, and advice it points out causes of ill health, and presents the fundamental laws of good health.

## SERVICE COURSES FOR MEN

2. Football. (1F, 1W)	Staff
4. Boxing. (1F, 1W, 1S)	Staff and G. Nelson
5. Boxing. (Advanced) (1F, 1W, 1S)	Staff and G. Nelson
6. Football. (1W)	Roning
7. Wrestling. (1F, 1W, 1S)	G. Nelson
8. Wrestling. (Advanced) (1F, 1W, 1S)	G. Nelson
12. Tack. (1S)	Staff
14. Handball. (1F, 1W, 1S)	Staff
15. Softball. (1S)	Staff
16. Swimming. (Beginners) (1F, 1W, 1S)	Staff
17. Swimming. (Intermediate) (1F, 1W, 1S)	Staff
23. Basketball. (1F, 1W, 1S)	Baker
26, 27, 28. Restricted Gymnastics. For students physically unable to take required physical education. Students may register only after consultation with head of department. (1F, 1W, 1S)	Staff
29. Sigma Delta Psi. (1S)	Heaton
34. Soccer. (1F)	Staff
35. Volley Ball. (1W)	Staff
37-38 Tumbling and Gymnastics. (1F, 1W, 1S)	Heaton

**SERVICE COURSES FOR WOMEN**

39. Soccer-Speed Ball. (1F)	Staff
40. Volleyball. (1F, 1W)	Staff
41. Basketball. (1W)	Staff
42. Softball. (S)	Staff
43. Field Hockey. (1S)	Staff
44. Tumbling and Stunts. (1W, 1S)	Staff
45, 46, 47. Restricted Activities. For students physically unable to take required courses in physical education. Students may register only after consultation with head of department. (1F, 1W, 1S)	Downs
52. Swimming. (Elementary). (1F, 1W, 1S)	Staff
56. Swimming. (Intermediate). (1F, W, or S)	Staff
60. Body Conditioning and Physical Fitness. (1F, 1W, 1S)	Staff
152. Synchronized Swimming. (1F)	Staff

**SERVICE COURSES FOR MEN AND WOMEN**

1. Hiking. (1 F, 1S)	Staff
3. Skiing (elem.) (1F)	Watters
9. Fencing. (Elementary). (1F, 1W, 1S)	Downs
13. Bowling. (1F, 1W, 1S)	Staff
18. Swimmers. (1F, 1W, 1S)	Staff
19. Skiing. (Interm.) (1W)	Staff
48. Modern Dance (Elementary) (1S)	Fuller
49. Modern Dance (Intermediate) (1W, 1S)	Fuller
61. Archery. (1F, 1W, 1S)	Staff
66. Badminton. (1F, 1W, 1S)	Downs
67. Tennis. (Elementary) (1F, 1S)	Staff
68. Folk Dance. (1F, 1W)	Staff
70. Tap Dancing. (1F, 1W, 1S)	Fuller
71. Tap Dance. (Interm.)	Fuller
72. Social Dancing. (1F, 1W, 1S)	Heaton
73. Golf. (1S)	Staff
74. Life Saving. Prerequisites: Red Cross Swimmers Card or permission of instructor. American Red Cross Certification is given to students who pass the examination. (2W, 2F, 2S)	Staff
76. Social Dance. (Advanced) (1F, 1S)	Heaton
90. Tennis. (Intermediate) (1S)	Staff
136. Golf. (Advanced) (1S)	Staff
141. Modern Dance (Advanced) (1W, 1S)	Fuller
155. Diving. Prerequisite: Swimming. (1S)	Staff
161. Archery. (Advanced) Prerequisite: 61. (1W, 1S)	Staff
166. Badminton. (Advanced) Prerequisite: P. E. 66, (1F, 1W, 1S)	Downs
167. Tennis. (Advanced) Prerequisite: P. E. 67. (1S)	Staff
168. Square Dancing. (1F, 1W, 1S)	Heaton

## THEORY AND PROFESSIONAL COURSES

**17A. Swimming.** For screening of all freshmen and transfer students majoring in Physical Education. (1F, 1W) **Watters**

**Sp. 20. Playground Dramatics and Pageantry.** See Speech 20.

**20, 21, 22. Fundamentals of Sports.** A freshman laboratory course for Physical education majors. These courses are prerequisites for P. E. 120, 121, 122. (1F, 1W, 1S) Taught alternate years. **Staff**

**24, 26. Dance Laboratory.** For teaching folk, square and tap to freshman and sophomore women majoring or minoring in physical education or dance. Material presented as a survey. (1F, 1S) Taught alternate years. **Fuller**

**30, 31, 32. Fundamentals of Sports.** A sophomore laboratory series for men physical education majors. These courses are prerequisites for P. E. 130, 131, 132, and are a continuation of the freshman class. Taught alternate years. Not taught 1954-55. **Staff**

**55. First Aid.** Standard American National Red Cross course in first aid with emphasis on practical use of the knowledge as applied to everyday life in various occupations. Detailed demonstrations and practice. American Red Cross First Aid certificate may be obtained by students who pass a satisfactory examination. (3F, 3W) **Nelson-Watters**

**75. Backgrounds and History of Physical Education.** Acquaints the student 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. (2F) **Heaton**

**77, 78, 79. Dance Laboratory.** For teaching the techniques of beginning, intermediate and advanced modern dance to freshman and sophomore women majoring in physical education or dance. Taught alternate years. (Not taught 1954-55) **Fuller**

**81. Rhythms and Dramatic Games.** Music for young children; its use in creative movement. Methods of presenting and developing rhythms are studied. (3F) **Fuller**

**83. Playground and Community Recreation Leadership.** Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (3S) **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) **Nelson (D.)**

**85. Organization of Intramural Sports.** Organization and administration of intramural sports in secondary schools. Sports, tournaments, units of competition, scoring systems, and co-ordination of intramural sports with physical education and athletics are considered. (3F) **Watters**

**86, 87. Sports Officiating.** Men, knowledge of rules, mechanics of officiating, proper instructions to other game officials such as timers and scorers, and game administrations. (2F, 2W) **Watters**

**92. Organization of Intramural Programs for Women.** Organization of sports days, play days, tournaments, and administration of intramural activities for women. (3W) **Downs**

**93. Sports Officiating for Women.** Techniques of officiating, knowledge of rules, and practical experience in officiating. (2F) **Clark**

**94, 95, 96. Physical Education Laboratory.** For teaching team sports fundamentals to lower division women majoring or minoring in physical education. Taught alternate years. (Not taught 54-55) **Downs**

**98. Physical Education Laboratory.** For teaching fundamentals of individual sports to lower division women majoring or minoring in physical education. (1F, 1W, 1S) Taught alternate years. **Downs**

**102. Dance Composition.** Composition based upon the special elements of direction, level, and dimension. Experience in composing for an individual and for group. (2F) **Fuller**

**103. Dance Composition.** Composition based upon the following musical forms: AB, Rondo, Theme, and Variation, Canon and Round, Dance Suite. (2W) **Fuller**

**104. Dance Production.** Composition done independently and participation in a performance required; lighting, staging, costume and make-up applied to a dance concert. (2S) **Fuller**

**106. Applied Anatomy and Physiology.** The structure of the human body in relation to adaptations made by the healthy body during mild and strenuous physical activity. Laboratory experience is included. (5F) **Nelson (D.)**

**111. Creative Rhythms for Schools.** Methods and materials used in guiding creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W) **Fuller**

**113. Construction of Physical Education Equipment.** Construction of and practice in the use of rhythmic instruments and play equipment. (3S) **Staff**

**120, 121, 122. Technique of Team Sports.** For students majoring in physical education. Prerequisites: P. E. 20, 21, 22. Techniques of dual combatives and team sports. Each student expected to prepare a teaching syllabus of class work. (2F, 2W, 2S) (Taught alternate years) **Staff**

**P. E. 124. Scoutmaster's Basic Training Experience.** The standard training course approved by the National Council and includes the following: Plans and Methods, Fundamentals, Organization and Leadership, Program Planning, Meetings, Hiking, and Camping. (2S) **Staff**

**130, 131. 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. Taught alternate years. (Not taught 54-55.) **Staff**

**132. Water Safety Instructor's Course.** Prerequisite: American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life-saving and use of small water crafts. Proper American Red Cross certification is given students who pass the examination. (2S) **Watters**

**135. Safety Education.** (a) The needs for safety education; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions; and dreadings, stressing various aspects of safety in many areas. (3W or S) **Staff**

**140. Dance History.** A history of dance from the primitive through Greek, Medieval and Renaissance periods into the theatrical dance forms: Ballet and Modern. (3) **Staff**

**145. Alcoholism and Education.** The alcohol problem is considered from the physiological, psychological, sociological, educational, historical, and legal aspects. The development of a correlated attack on the problem is emphasized. (3S) **Nelson (D.)**

**150. Methods in Dance.** The place of various types of dance in the physical education program. Emphasis given methods of teaching these activities and practice in teaching class members. (3S) **Fuller**

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

**153. Leadership in Dance.** An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing is prerequisite. A syllabus is required. (2S)

**Heaton**

**157. Social Recreation Leadership.** Practical experience in conducting social recreation activities by planning and conducting social recreation evenings for church, school and civic groups. Prerequisite: P. E. 83. Time and credit arranged. (F, W, or S)

**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. Taught alternate years. (Not taught 1954-55)

**Downs**

**165. Techniques of Sports for Women.** Upper division students majoring or minoring in physical education are taught techniques of teaching sports. Taught alternate years. (2S)

**Downs**

**177. Physical Education in the Elementary School.** Characteristics of the growth and development of the elementary school child with special reference to his needs in social and physical development which can be aided through physical activities. (3F, 3W)

**Downs**

**179. Camping and Camp Craft.** Training in camp technique and camp leadership. Different types of camps and their organization, supervision, equipment and safety are considered. Several short hikes and an overnight camp are conducted during the course. Each class member is expected to participate in these hikes. (2S)

**Watters**

**180. Athletic Training and Conditioning.** Conditioning of men for the various sports. Principles, techniques and practices of athletic training. Special instruction given to taping, bandaging, massage, use of special methods and devices to prevent and care for injuries. (2F)

**Nelson (D.)**

**181. Corrective Physical Education.** Facts in body mechanics which contribute to the basic principles of posture. Analysis of postural deviations, their prevention and correction. Prerequisite: P. E. 106 (3W)

**Nelson**

**182. Material and Methods of Elementary School Physical Education.** Practical experience in, participation in, and direction of activities in the well balanced physical education program. Students teach at all grade levels in local elementary schools. (3W, 3S)

**Downs**

**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. (3F)

**Hunsaker**

**184. Administration of Physical Education.** Administration procedures in the conduct of physical education in the high school; curriculum construction and program planning. (3S)

**Hunsaker**

**188. Methods in Football.** Fundamentals of football, theory and practice, details of each position on the team, training, and managing, complete technique of developing offensive and defensive tactics. (2W)

**Roning**

**189. Methods in Basketball.** Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; methods of defense and offense. (2S)

**Baker**

**190. Methods in Track and Field.** How to train for various track and field events; their form and technique; conduct of athletic meets; construction, use, assembling of and equipment used by the participants on the field; development of certain types of individuals for certain events. (2S)

**Maughan**

**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 and Measurements in Physical Education.** Practical studies of tests now used and technique of test construction. (3W) **Hunsaker**

**194. Problems of Athletics.** Discussing problems in athletics relative to public relations, athletic management, administration of athletics, purchase of equipment, schedules, plant layout, etc. (3S) **Roning**

**196. Organization of Recreation.** Problems of organization and administration of community recreation departments, including staff, facilities, program of activities, and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school co-operation in a united recreation program. (3W) **Heaton**

**250. Reading and Conference.** Provides for individually directed study. **Hunsaker**

**271. Research and Thesis Writing.** Credit arranged. **Hunsaker**

**295. Problems in Physical Education.** (F, W, S) Credits arranged. **Hunsaker**

**299. Physical Education Seminar.** (3F, 2W, 3S) **Hunsaker**

## Psychology and Guidance

**Arden N. Frandsen**, Professor and Head of Department; **David R. Stone**, **Heber C. Sharp**, **Bruce Gardner**, Associate Professors.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Courses in Psychology contribute, therefore, to both professional training and personal development of students in nearly every department of the College.

A major or preferably a master's degree in psychology should prepare students professionally (1) for guidance and psychological counseling in high schools; (2) for teaching psychology, study habits, mental health, and personality development in high schools; (3) for diagnostic and remedial teaching and for dealing with personality and conduct problems of children in elementary schools and in child guidance clinics; (4) (with additional courses in Education) as a "special" teacher of exceptional children; (5) as clinical psychologists (with additional graduate training) in mental hygiene clinics and hospitals; (6) for personnel work (at the junior professional level) in industry, the U. S. Employment Offices, various Civil Service positions, and in the military services, and (7) for further graduate study in psychology, education, child development and social work. Psychology is also a suitable major for students planning to study medicine, nursing, law, and social work, or personnel work after graduating with a bachelor's degree.

The Department of Psychology has arrangements with schools, social welfare agencies, juvenile courts, the industrial school, and a mental hospital in which graduate students and some seniors may have practical experience in the general field of clinical psychology. The experiences include educational and vocational counseling; diagnosis and guidance of gifted, subnormal, and delinquent children; diagnosis and treatment of conduct and personality problems; diagnosis and remedial instruction for achievement difficulties in school subjects; teaching psychology in high school or college; teaching exceptional children; and for various kinds of psychometric work.

**Lower Division Preparation for Psychology.** The best preparation for psychology is basic training in biological science, social science, literature, mathematics and physical science. In completing the group requirements, it is recommended that the following courses be included: Physiology 4; Sociology 70; English 40, 45, and other literature (novel and biography) courses; Mathematics 34, 35, and desirably additional mathematics courses for students with interest in the subject; Physics 7. The minimum of 40 hours in the "group requirements" might well be exceeded. Psychology courses for lower division students expecting to major in psychology are Psychology 53, 71, 80 and, if desired before attaining upper division status, 102, 105, and 112.



**Requirements for a major in Psychology** include 40 credits of approved courses from the following basic: Psychology 53, 71, 102 or 105, 112, 127, 140 or 145, 161, 183, 281, 282; and elective: from Psychology 80, 102, 105, 108, 114, 115, 121, 123, 140, 145, 155, 191; Sociology 170; Education 110; Speech 167, or 173. As upper division electives, Zoology 111; Physiology 121, 122, 123; the Education courses for teacher certification; Sociology 130, 153; S. W. 165, 270; an upper division courses in literature are also suggested.

**A minor in psychology** (which should include Psychology 53, 71, 102, or 105, 112, 127, 140, or 145, 161, 181, and 183) is recommended for high school teachers who expect to participate in the school guidance program, social workers, students majoring in speech correction, students whose major is business administration, and students majoring in other social sciences.

**Master of Science Degree in Psychology.** Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program planned to meet the student's professional objectives may be arranged to include courses both from psychology and pertinent related fields. In preparation for meeting the requirements for the Professional School Counselor's Certificate, for example, courses mainly from psychology and education would be chosen. Lists of the prescribed courses for this certificate and for other special professional objectives may be obtained from the Department Head. Besides the courses required for a specific professional objective, the Master of Science degree in psychology should include, as a graduate or undergraduate student, study in the following fields: (1) general and experimental, (2) systems and history, (3) learning, (4) child and adolescence (included in educational), (5) clinical psychology, (6) mental hygiene, abnormal psychology and physiological, (7) social psychology, (8) personality, (9) statistics, and (10) research thesis. Besides additional courses from those listed in each of the above 10 areas, courses planned especially for graduate students are: Psychology 115, 123, 191, 202, 205, 208, 212, 214, 216, 217, 280, 281, 282, 284, 285, 286, 287 or 288. For students who have not majored in psychology thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin graduate study in psychology.

**Master of Science Degree in Guidance.** Any able student who has a teaching certificate and a total of 30 credits in Education and, or in Psychology is eligible to begin study for this degree. Included in the courses required are: Education 110; Guidance 187, 213; and Psychology 123 or 140, 127, 183, 202 or 205, 281, 282, 285, 288; and a thesis in the field of guidance. These are also the courses required for a Professional Counselor's Certificate.

**Personnel in Business and Industry:** In cooperation with the Inter-Departmental Program in Human Relations, psychology students may earn a Master's degree in Personnel Psychology. This program would include the central courses outlined by the committee, and the following courses: Psy. 71, 80, 102 or 105, 112, 127, 140 or 145, 181, 182, 183; Speech 9; Merchandising 63, 156; Sociology 130, 160, 161; and Social Work 165, 174.

**Doctorate in Educational Psychology and Counseling.** The Department of Psychology in co-operation with the Department of Education has planned a program of advanced graduate study in counseling, school clinical psychology, and educational psychology that leads to the Ph.D. degree in Educational Psychology. The program requires two years of graduate study (partly supervision of individual study) beyond the M.S. degree, plus a six months' internship in school, mental hygiene clinic, hospital, or social agency. Prospective candidates interested in learning more about this program should confer with Dean E. A. Jacobsen or Professor Arden Frandsen.

### Courses

**33. Mental Hygiene for College Students.** Deals with the common personal and social problems of normal people, that is, problems which arise when people try to get along together. It is intended as a basis for improving self-understanding, personal and social effectiveness, happiness and emotional health. (3F) **Sharp**

**51. Psychology for Nurses.** ( ) Time arranged.**Sharp**

**53. Elementary General Psychology.** Principles of human behavior and experience including: nature of personality; factors of determining development; how we learn, observe, and think; motives of human conduct; dealing with people; maintenance of personal efficiency and mental health. For Lower Division students in all schools of the College. (5F, W or S) **Staff**

**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. (3W) **Sharp**

**80. Reading and Study Habits.** A practical course, highly individualized, designed to aid students in improving the efficiency of their work and study habits. Individual appointments arranged for one-third of the time. (3F, W, or S) **Stone**

**102. Educational Psychology.** A professional course for prospective high school teachers intended to increase understanding of adolescents and to develop insight into conditions for effective learning. Applications to development in adolescence of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects are emphasized. Prerequisite: General Psychology. (5F, W or S) **Stone**

**105. Child Psychology and Development.** The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional development in children from birth to adolescence. Generalizations with respect to dynamics of personality, individual differences, emotions, motivation, how children learn, observe, and think are applied to understanding and guiding children's behavior in home, school, and community. Opportunity for observation and applications of psychological methods of child study in the school is provided. Prerequisite: General Psychology. (3F, W, S) **Frandsen**

**108. Educational Psychology for Elementary School Teachers.** A study from the point of view of psychological theory and research, of the aims, selection and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. Tool subjects are emphasized. Prerequisite: General Psychology. (2F, W, S) **Frandsen**

**112. Application of Statistics to Education and Psychology.** Elementary study of statistical procedures used in handling test scores in schools and of the concepts needed to read current educational and psychological literature. May be taken by last quarter sophomores who have taken General Psychology. (3F or S) **Frandsen**

**115. Seminar. Readings and Discussions on Current and Special Topics in Psychology.** Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or periodical literature on a specialized topic, selected according to student's interest. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2F, W or S) **Staff**

**121. Individual Differences.** The nature, extent, and causes of human differences and of the implications and applications of a recognition of these differences in several major life activities. The concepts of human differences have useful applications in the work of the students majoring in the other social and biological sciences. (3S) **Sharp**

**123. Psychology of Exceptional Children.** The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment, suited to their needs. The groups included are the mentally deficient, physically handicapped, the gifted, and children having serious personality and conduct problems. (3W or Su.) **Sharp**

**127. Psychology of Learning.** A comprehensive study of descriptions of learning, factors related to efficiency, explanatory theories of learning, and of applications of the facts and explanatory principles to guiding learning in school and out-of-school situations. Prerequisite: General Psych. (3S) **Frandsen**

**140. Abnormal Psychology.** A descriptive and explanatory study of the varieties of mental abnormality—psychoses, psychoneuroses, and minor maladjustments—their causes, the methods of treatment and the mental hygiene approach in preventing psychological maladjustments. Prerequisite: General Psych. (3S) **Sharp**

**145. Mental Hygiene.** Designed for teachers and other workers in social occupations. Based on the philosophy that a knowledge of the factors which influence mental health should be in the possession of all who work with people. Intended to promote understanding of emotional and social adjustment and as a basis for guiding children, adolescents and adults toward improved mental health. Prerequisite: General Psych. (3W) **Sharp**

**155. Psychology of Business and Industry.** Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice; selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work, and psychological aspects of training for work in business and industry. (See also Business Administration 155) Prerequisite: General Psychology or instructor's approval. (3F) **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 are considered in terms of such topics as propaganda, institutional behavior, "social" neuroses, morale, leadership, and membership. Prerequisite: General Psych. (3W) **Stone**

**162. Social Psychology of Teaching.** An application of the concepts of "self" and of "group dynamics" to teaching, and to leadership and participation in other social situations. (3W) **Stone**

**165. Psychology of Military Leadership.** (3S) **Gardner**

**175. Physiological Psychology.** Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisite: General Psych. (3S) **Sharp**

**183. Theory and Techniques of Counseling.** Principles and techniques of counseling students on problems of curriculum planning and vocational choice, on problems of improving methods of study, and on problems of emotional and social adjustment will be studied. Applications will be made also to administrative, supervisory teaching, and other inter-personal relations situations. (3S) **Staff**

**191. History and Systems of Psychology.** History of psychology and a critical comparison of the several systematic points of view on major problems in psychology. (3S) **Stone**

**202. Psychology of Adolescence.** Growth, psychological and social characteristics and development, educational and guidance needs, and adjustment problems of adolescents as met in schools, homes, and communities. Prerequisite: Educational Psych. (This course and the Psychology of Learning provide training in advanced educational psychology for graduate students in secondary education and in psychology.) (3Su.) **Stone**

**205. Problems in Child Psychology and Guidance.** Elementary school child guidance problems—of the roles of teachers and child guidance specialists in promoting mental health and in diagnosing and treating problems of achievement, social adjustment, and emotional maladjustment. The course may be considered as an advanced course either in child psychology or in elementary school guidance. Alternates with Psychology 280. (3F) **Frandsen**

**208. Advanced Educational Psychology of the Elementary School.** Advanced study, from the points of view of learning theory and experiments in elementary education and child psychology, of the aims, curriculum, methods of teaching, provisions for individual differences, and evaluation of outcomes in the elementary school. Intended especially for supervisors, principals, and teachers of the ele-

mentary school interested in graduate study. Theses topics are suggested. Provision is also made for undergraduate students who need the course Psych. 108 for certification. (3Su.) **Frandsen**

**212. Treatment of Psychometric Results.** Statistical methods of representation, and analysis of interrelationships of psychological test scores. (2W) **Frandsen**

**214. Independent Readings in Psychology.** For students who cannot participate in the discussions in Psychology 115, this course provides opportunity for independent readings and conferences on topics selected by the student. (2F, W or S) **Staff**

**216. Research on Special Problems in Psychology.** Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) **Staff**

**217. Research for Master's Thesis in Psychology.** Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) **Frandsen, Stone, Sharp, Gardner**

**280. Personality.** An advanced study of the organization, development, dynamics, and appraisal of personality. Theories and empirical investigations of personality will be studied as a basis for arriving at integrated concepts of the nature and development of personality. Both the biological and cultural determinants of personality will be considered. Alternates with Psych. 205. (3F) **Frandsen**

**281. Psychometrics Applied to Guidance.** For school counselors, personnel workers, social workers, and clinical psychologists. Consideration is given selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisites: General Psychology and Elementary Statistics. For seniors or graduate students. (5F) **Frandsen**

**282. Individual Diagnostic Intelligence Testing.** Theory and techniques of testing, including practice in the administration of (a) the Stanford-Binet and other individual tests especially suited to psychological examination of children, and (b) the Wechsler-Bellevue and related tests for use with adolescents and adults. Interpretation of test data. (5W) **Frandsen**

**284. Hospital Treatment of Mental Patients.** Seminar and staff conferences on personality appraisals, diagnoses, and treatment of mental hospital patients. Students observe and participate in treatment to the extent they are qualified in all of the hospital routines and "treatment" activities in which patients participate. (4F, W or S) **Staff**

**285. Projective Methods for the Study of Personality.** The dynamics of human adjustment and the common projective methods for revealing motives, attitudes, and adjustment mechanisms in individual personalities. (5S) **Frandsen**

**286. Problems in Counseling and Clinical Psychology.** Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy are studied. (2F) **Frandsen**

**288. Practicum in Clinical Psychology.** Arrangements are made for obtaining experience under staff supervision in vocational guidance; diagnostic testing and writing of interpretative reports; counseling; psychotherapy; diagnostic and remedial teaching. Subjects include children, adolescents, and adults in schools, institutions for the feeble-minded and for delinquents, and patients in mental hospitals. Psychological procedures and institutions are selected according to qualifications and interests of each student. Time and credit arranged. (F, W or S) **Staff**

### Guidance

**213. Organization and Administration of Guidance.** Development and evaluation of plans for utilization of school and community resources in guidance. (3S) **Oakes**

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

**297. Workshop in Guidance.** A faculty or part of a faculty in a school or school district studies, evaluates, and attempts to improve the use of the school's resources for more effective guidance in its several phases. (3) **Staff**

# SCHOOL OF ENGINEERING AND TECHNOLOGY

J. E. CHRISTIANSEN, Dean

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## General Information

The School of Engineering and Technology consists of the Division of Engineering and the Division of Technology. The Division of Engineering offers both undergraduate and graduate curricula in professional engineering. The Division of Technology offers both two-year and four-year curricula in several specialized fields of Industrial Technology. It also offers undergraduate and graduate courses in Industrial Education.

**Admission.** For general requirements, see "Academic Regulations," in Introduction. For entrance in the Division of Engineering, students should have taken in high school Algebra B and Solid Geometry. The curricula are so arranged, however, that students may enter deficient in these subjects and still complete the requirements in four years.

**Scholarship.** All students must maintain an average grade of C or higher to remain in College and be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade of C or higher. In the Division of Engineering, it is important that students make a grade of C or higher in all mathematics taken during the freshman and sophomore years. Students who fail to do this usually have difficulty in upper division engineering courses.

**Graduation.** Candidates for graduation must satisfy the general college requirements listed in "Academic Regulations," except those pertaining to group requirements. They must, in addition, satisfy the requirements of the prescribed curriculum of their elected major.

**Opportunity for Graduates.** The tremendous development in modern industry, the necessity for control and development of natural resources, the rapid advance of transportation and communication, and the development of structures to meet the needs of society, give assurance that graduates of the School of Engineering and Technology will have ample opportunity for remunerative professional employment.

**Faculty Advisers.** Personal contact with the student is provided through a system of 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 assistance is given to members of each graduating class, to alumni who desire to change positions, and to undergraduates who wish summer employment.

## DIVISION OF ENGINEERING

The Division of Engineering offers undergraduate curricula in Agricultural Engineering, Civil Engineering, Electrical Engineering (Electronics and Communications Option) and Tool Engineering. Graduate study for the Master of Science degree is offered in Agricultural Engineering, Civil Engineering, and Irrigation and Drainage Engineering. The Irrigation and Drainage Engineering Department provides a two-year graduate program for the professional degree of Irrigation Engineer and collaborates with other departments in offering the Doctor of Philosophy degree in Irrigation Science.

A department of Engineering Drawing provides service courses in drafting for all departments of the College.

**Objectives.** The objectives of the four-year curricula in Engineering are to provide the student an opportunity to obtain the thorough, fundamental, and technical education necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities that are essential to high professional attainment.



**Upper Division Standing.** A student must have completed 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22, and Mathematics 99 or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

**Engineering Societies.** General professional association and advancement are promoted by activities of student branches of national engineering societies. The following are represented, either by faculty membership or student chapter, or both: American Concrete Institute, American Geophysical Union, American Road Builders Association, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society of Electrical Engineers, American Society of Mechanical Engineers, American Society of Tool Engineers, the Institute of Radio Engineers, and others.

**Honor Societies and Scholarships.** The Alpha Delta chapter of Sigma Tau was installed at Utah State Agricultural College in February, 1951. Membership is elected from junior and senior Engineering students whose scholarship is in the upper third of their class.

Agricultural Engineering upper division students with high scholarship are eligible for membership in Alpha Zeta. Graduating Seniors in the upper ten percent of the class are eligible for membership in Phi Kappa Phi. Graduate students may be elected to Associate Membership in Sigma Xi, honorary scientific society.

Several scholarships are available to engineering students. (See "Scholarships, Fellowships, Awards" in Introduction to catalog.)

**Summer Surveying Camp.** Prior to registration for the junior year, a three-week survey camp is held where plane, topographical, and route surveying are taught. Completion of Summer Surveying Camp, or acceptable substitution, is required of all Civil and Agricultural Engineering students. Students taking this course should be immunized against Rocky Mountain Spotted Fever.

**Engineering Seminars.** Engineering seminars are a feature of the advanced engineering work. Course 198 is required of all Agricultural and Civil Engineering students in their Senior year.

**Field Trips.** Field trips to local construction projects, engineering works, and industries are arranged for engineering students. Seniors in engineering usually take a supervised field trip covering the major engineering works in the Western United States. This trip is scheduled in the Spring Quarter.

### COMMON FRESHMAN CURRICULUM IN ENGINEERING

Dept. No.	Course Title	F	W	S
C.E. 1, 2, Electives <sup>1</sup>	Engineering Orientation .....	1	1	1
C.E. 65	Engineering Problems .....			1
E.D. 61, 62	Engineering Drawing .....	3	3	
E.D. 63	Descriptive Geometry .....			3
Math. 34 <sup>2</sup>	Introduction to College Algebra .....	3		
Math. 35	College Algebra .....		5	
Math. 46	Plane and Spherical Trigonometry .....			5
Chem. 10, 11	General Chemistry .....	5	5	
Shop <sup>3</sup>	.....			3
English 17, 18, 19	Freshman English .....	3	3	3
M.S. or A.S.	Basic Military or Air Science .....	1	1	1
		16	18	17

1—Orientation taken in Spring Quarter is under direction of the major department.

2—Students who have completed Algebra B in high school, and who make satisfactory grades on the mathematics entrance examination, may omit this course and begin with Math. 35 Fall Quarter.

3—See departmental curriculum for recommendation.

## Engineering Drawing

Austin G. Loveless, Associate Professor and Head of Department; Frederick Preator, Professor; Bertis L. Embry, Associate Professor; B. O. Willhite, Willis A. Tingey, Assistant Professors; Ross A. Nyman, Instructor.

The Engineering Drawing department offers service courses in drafting and blueprint reading to all departments of the College.

The Department's four drafting laboratories have a total floor space of 5400 square feet and are equipped with 120 individual drafting tables. Modern instructional equipment such as drafting machines, reproduction facilities, moving pictures, slides, and other teaching devices are available to students. Since this is primarily a service department, basic courses are designed to meet needs of many departments.

Students may qualify for a minor in Engineering or Mechanical Drawing on completion of 18 credits, including Descriptive Geometry.

### TWO-YEAR CURRICULUM LEADING TO CERTIFICATE OF COMPLETION IN DRAFTING

This two-year terminal curriculum is being offered for those people having drafting interest and ability, and who desire to prepare themselves as draftsmen. The curriculum will provide the student with the basic drafting techniques and the necessary related information to enable him to obtain a position in industry.

First Year				Second Year			
Course	F	W	S	Course	F	W	S
Math. 34, 35, 44 .....	3	5	3	E.D. 63, 195, 197* .....	3	3	5
English 17, 18, 19 .....	3	3	3	E.D. 95 .....	3	---	---
E.D. 61, 62, 93 .....	3	3	3	T.E. 57, 58 .....	---	2	2
T.E. 51, 52, 53 .....	3	3	3	Phys. 6, Chem. 10 .....	5	5	---
Speech 5 .....	3	---	---	English 112 .....	---	4	---
M.S. 1, 2, 3 .....	1	1	1	I.E. 120 .....	3	---	---
Electives .....	1	1	3	Econ. 51 .....	---	---	5
	17	16	16	M.S. or A.S. ....	1	1	1
				Electives .....	1	1	3
					16	16	16

### Courses

**59. Blueprint Reading and Industrial Drawing.** Broad coverage for those desiring only one quarter's work in drafting. Reading and interpretation of blueprints, lettering, use of instruments, and basic drafting practices. Two lectures, two labs. (3F, S) Nyman

**60. Elementary Drafting.** For Forestry students. Use of instruments, simple lettering, and drafting fundamentals. One lab. (3W) Tingey

**61, 62. Engineering Drawing.** The use of drafting instruments, graphic solutions, applied geometry, lettering, principles of shape and size description, sectioning, and standard elements and symbols. Problems are included in sketching; pictorial illustrations are made from orthographic views. (3F, W, S) Staff

**63. Descriptive Geometry.** Principal and auxiliary views, points, lines and planes, developments, intersections and warped surfaces. Engineering problems relating to cut and fill, mining, geology, and industrial design are selected. Prerequisites: E.D. 61 or L.A. 20. One lect., two labs. (3F or S) Staff

**93. Mechanical Drawing.** Advanced work for those interested in a drafting minor. Includes basic work in industrial drawing, including machine fasteners, developments for patterns, and fundamentals of architectural, structural, welding, piping, and electrical drawings. Prerequisite: E.D. 62. (3F, S) Willhite

**94. Working Drawings and Specifications.** An introduction to architectural drawing and specifications applied to building and construction problems. Scale drawings including plans, elevations, sections and construction details are completed with tracings and prints. Prerequisites: E.D. 62 (3W) **Willhite**

**95. Machine Design.** Mechanisms of power and motion and the design of machine parts incorporating standard methods consistent with industry. Prerequisite: E.D. 93. (3F) **Willhite**

**120. Mechanical Drawing for Industrial Arts Teachers.** Emphasis is given to the preparation of course work and the training of teachers to teach architectural, sheetmetal, machine, and electrical drawing, as applied to the junior and senior high school industrial arts program. Prerequisite: E.D. 62 or equivalent. (3F) **Loveless**

**194. Mechanical Perspective.** Practical problems in angular, parallel, and oblique perspective. Techniques in rendering finished drawings. Prerequisites: E.D. 94 or 95. (3S) **Loveless**

**195. Industrial Production Illustration.** Translation of working drawings into dimetric and trimetric projections, exploded views, and assemblies as a means of rendering industrial illustrations. Prerequisite: E.D. 94 or 95. (3W) (Taught alternate years with E.D. 194) **Loveless**

**196. Aircraft Drawing.** Aircraft techniques, numbering systems, change methods, and technical specifications as stressed. Prerequisite: E.D. 95. (3S) **Willhite**

**197. Drafting Room Practice.** Personnel and organization of drafting room and its position in industry. Preparation, reproduction and care of drawings and prints. Prerequisite: E.D. 95. (5S) **Willhite**

## Agricultural Engineering

Spencer H. Daines, Associate Professor and Head of Department; J. E. Christiansen, C. H. Milligan, Joseph Coulam, Professors; A. Alvin Bishop; Melvin J. Greaves, Bertis L. Embry, Dean K. Fuhrman, Associate Professors; J. Donald Wadsworth, Assistant Professor; Von H. Jarrett, Instructor.

O. W. Israelson, Professor Emeritus.

The Department of Agricultural Engineering offers courses involving application of engineering knowledge to solution of farm problems. The most important of these problems are related to farm machinery, farm power, farm structures, drainage, irrigation, soil erosion control, and modern farm and home equipment.

The four-year curriculum leading to a Bachelor of Science degree in Agricultural Engineering is fully accredited by the Engineers' Council for Professional Development. This curriculum includes all basic courses common to other engineering curricula, such as mathematics, physics, and mechanics, fundamental subjects in the different engineering departments; courses selected to familiarize the student with modern methods of agriculture; and a thorough treatment of Agricultural Engineering courses.

Graduates from this curriculum have opportunity to work in research, sales, or advertising in the farm machinery and farm motor industry; farm structure design, or promotional work with the building materials industry; soil erosion prevention; rural electric service; management of farms, and teaching, research and extension in colleges, experiment stations and in the United States Department of Agriculture. Students majoring in Agricultural Engineering should be thoroughly acquainted with farm practices and have a real interest in agriculture.

In addition, the Department offers service courses in farm mechanics and forging, designed to give students practical training in use of hand and power tools and other mechanical skills related to farming and industry. Classes are open to all college students.

**AGRICULTURAL ENGINEERING CURRICULUM**

Degree: Bachelor of Science in Agricultural Engineering

Freshman				Sophomore				
Course	F	W	S	Course	F	W	S	Su
C.E. 1, 2; A.E. 3 .....	1	1	1	C.E. 84, 82, 85, 87....	4	3	4	4
C.E. 65 .....	---	---	1	Math. 97, 98, 99 .....	5	5	5	---
Math. 34 <sup>1</sup> , 35, 46 .....	3	5	5	Phys. 20, 21, 22 .....	5	5	5	---
English 17, 18, 19 .....	3	3	3	Agron. 56 .....	---	4	---	---
E.D. 61, 62, 63 .....	3	3	3	Ag. Econ. 53 .....	3	---	---	---
Chem. 10, 11 .....	5	5	---	Speech 5 .....	---	---	3	---
A.E. 21 .....	---	---	3	M.S. or A.S. ....	1	1	1	---
M.S. or A.S. ....	1	1	1					
	16	18	17		18	18	18	4
Junior				Senior				
Course	F	W	S	Course	F	W	S	
C.E. 101, 102, 103 .....	4	4	4	C.E. 109, 110 .....	---	1	1	
C.E. 141, 142 .....	---	4	4	C.E. 111, 112 .....	4	3	---	
E.E. 107 .....	4	---	---	A.E. 116, 106 .....	---	3	4	
I.D. 112 .....	3	---	---	A.E. 115, 108 .....	3	---	4	
Agron. 107 .....	---	5	---	I.D. 146, 148 .....	---	3	3	
C.E. 196, 192, 173 .....	4	3	4	English III .....	4	---	---	
Approved Electives .....	3	3	5	C.E. 198 .....	---	1	1	
	18	19	17	Approved Electives <sup>2</sup> .....	3	6	3	
				A.E. 110 .....	3	---	---	
					17	17	16	

1—Students who have completed high school Algebra B and and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 Fall Quarter.

2—Approved electives may be selected from the following courses: Pol. Sci. 20, 181; An. Hus. 1; Poul. Hus. 1; Biology 1; Geology 3; Ag. Econ. 102, 103, 106; A. E. 109; I. D. 149, 145, 160; C. E. 105, 106, 150, 190, or other courses approved by the major professor.

### TYPICAL PROGRAM OF STUDY FOR TWO-YEAR CERTIFICATE OF COMPLETION IN AGRICULTURAL MECHANICS

First Year				Second Year			
Course	F	W	S	Course	F	W	S
Math. 34, 35, 44 .....	3	5	3	Agronomy 56 .....	4	---	---
Engl. 17, 18, 19 .....	3	3	3	Agric. Econ. 53 .....	---	3	---
E.D. 61, 62, 63 .....	3	3	3	An. Hus. 10 .....	---	---	5
Welding 91, 94 .....	3	3	---	Speech 3 .....	3	---	---
A.E. 11, 21 .....	2	---	3	E.E. 21, T.E. 56 .....	---	4	3
I.D. 10 .....	---	---	4	A.E. 14, 15 .....	3	3	---
M.S. or A.S. ....	1	1	1	A.E. 113, 121, 105 .....	3	3	5
Approved Electives .....	2	2	---	M.S. or A.S. ....	1	1	1
	17	17	17	Approved Electives .....	3	3	3
					17	17	17

This program is suggestive only. Variations are permitted according to a student's objectives so long as he has the approval of his advisor and department head.

### Courses

**3. Orientation.** To familiarize freshman Agricultural Engineering majors with opportunities and requirements of an Agricultural Engineer. Lectures. Films and field trips. (1S) **Staff**

**4. Dairy Mechanics.** Basic equipment found in modern dairy plants; its accessories and upkeep. Three lectures, one lab. (4F) **Daines**

**11. Forging and Bench Metal Work.** (Especially for agricultural students). Instruction is divided equally between hot and cold metalwork. The first deals with fundamental forging operations. The second consists of the use of hand and power metalworking tools and layout work. Two labs. (2F, W or S) **Jarrett**

**14. Farm Power for Agricultural Students.** Principles, operation, care and maintenance of internal combustion engines and electric motors. Two lectures, one lab. (3F or S) **Daines**

**15. Farm Machinery for Agricultural Students.** Principles of mechanics and materials applied to farm machinery. Operation, adjustment, and care of agricultural machines. Two lectures, one lab. (3W or S) **Embry**

**21. General Farm Mechanics.** Basic course in use of hand and power tools, such as are used on the farm. Basic instruction in woodworking, welding, and forging. Three labs. (3W) **Jarrett**

**82. Forge Practice. Fundamental operations.** Recommended for Industrial Arts, Woodworking, and Building Construction students. Two labs. (2F, W or S) **Jarrett**

**83. Forge Practice.** A beginning course in forge practice, more extensive than 82. Three labs. (3F, W or S) **Jarrett**

**85. Forge Practice.** Advanced forging with emphasis placed on farm tools and implements. Prerequisites: A.E. 82 or 83. Three labs. (3W) **Jarrett**

**105. Farm Woodwork and Building for Agricultural Students.** Location, planning, and construction of farm buildings. Wood and metal preservatives, fences and fencing, and the farm workshop. Three lectures, two labs. (5F or S) **Daines**

**106. Farm Structures.** Economics of farm structures; insulation as it involves heating and ventilating; mechanics of farm structures; types of construction; building materials; location and planning of the farmstead; fundamental requirements and design of farm buildings. Prerequisite: C.E. 101. Three lectures, one lab. (4S) **Daines**

**108. Engineering Aspects of Soil and Water Conservation.** Extent and kinds of erosion, rate of water absorption, soil erodibility, soil vegetation and cultural practices. Erosion control structures, surveys for hydraulic design of terraces, terrace outlets and soil-saving dams. Tillage and farming methods, strip-cropping, erosion and alkali problems on irrigated land. Three lectures, one lab. (4S) **Bishop**

**109. Farm Utilities.** Modern methods of heating, lighting, ventilating, water supply and farm sanitation; farm electrical systems and appliances. Three lectures, one lab. (4W) **Daines**

**110. Pumps and Blowers.** Selection, installation, operation, and maintenance of pumps, blowers, and hydraulic couplings. Prerequisites: C.E. 142. Two lectures, one lab. (3F) **Greaves**

**113. Farm Machinery Repair.** Applied problems in farm machinery repair and maintenance. Prerequisite: A.E. 82 and Weld. 96. Three labs. (3F or S) **Jarrett**



**115. Farm Implements.** Selection, operation, adjustment, and care of agricultural machines. Prerequisite: C.E. 101. Three lectures. (3F) Embry

**116. Farm Tractors.** A study of design, operation, and performance. Efficiencies and ratings as determined by the Nebraska Tractor Tests. Prerequisite: C.E. 101. Two lectures, one lab. (3W) Daines

**121. Farm Tractor Maintenance.** Operation, care, and maintenance. Does not include major overhaul and repair work. One lecture, one lab. (2W or S) Jarrett

**184. Ornamental Iron Work.** Designing and making of iron furnishings, interior and exterior railings, wrought iron furniture, trills, jardiniers, sign brackets, etc. Prerequisite: A.E. 82, 83, or 85. Two labs. (2S) Jarrett

**230. Special Problems in Agricultural Engineering.** Independent study of chosen problems in agricultural engineering. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. Staff

**298. Thesis.** Time and credit arranged. (F, W or S) Staff

## Civil Engineering

J. E. Christiansen, Professor and Head of Department; O. W. Israelsen, Professor Emeritus; H. R. Kepner, C. H. Milligan, E. M. Stock, Professors; A. Alvin Bishop, Melvin J. Greaves, Spencer H. Daines, Bertis L. Embry, Dean K. Fuhrman, Associate Professors; Willis A. Tingey, Reynold K. Watkins, Assistant Professors.

Civil Engineering consists of the economic application of the laws, forces and materials of nature to the design and construction of engineering structures, including irrigation and drainage systems, highways, railways, bridges, buildings, dams, water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

The carefully planned curriculum in Civil Engineering is accredited by the Engineers' Council for Professional Development. It is based upon a thorough training in English, mathematics, physics, and chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to many phases of Civil Engineering. Special emphasis is placed upon work in Irrigation and Drainage.

A Summer Surveying Camp is required; academic work is supplemented by local field trips during the junior year, and a major field trip of approximately one week duration, in the senior year. These field trips provide opportunity for first-hand study of projects under investigation, construction, and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

The Civil Engineering department is housed mainly in the Engineering Building, where well-equipped laboratories and classrooms provide ample facilities for experimental work. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. A model hydraulic laboratory demonstration unit is available for instruction and laboratory use. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the engineering properties of soil. The materials testing laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscopes.



**CIVIL ENGINEERING CURRICULA**

Degree: Bachelor of Science in Civil Engineering

Freshman				Sophomore				
Course	F	W	S	Course	F	W	S	Su
C.E. 1, 2, 3.....	1	1	1	C.E. 84, 82, 85, 87....	4	3	4	4 <sup>3</sup>
C.E. 65 .....	1	1	1	Math. 97, 98, 99.....	5	5	5	....
E.D. 61, 62, 63 .....	3	3	3	Physics 20, 21, 22.....	5	5	5	....
Chem. 10, 11 .....	5	5	....	Speech 5 .....	3	....	....	....
English 17, 18, 19 .....	3	3	3	Economics 51 .....	....	5	....	....
Math. 34 <sup>1</sup> , 35, 46 .....	3	5	5	Geology 3 .....	....	....	5	....
T.E. 56, or Weld. 96 .....	....	....	3	M.S. or A.S. ....	1	1	1	....
M.S. or A.S. ....	1	1	1					
	16	18	17		18	19	20	4

Junior				Senior			
Course	F	W	S	Course	F	W	S
C.E. 101, 102, 103 .....	4	4	4	C.E. 105, 106, 107 .....	6	6	5
C.E. 196, 141, 142 .....	4	4	4	C.E. 108, 109, 110 .....	1	1	1
C.E. 120, 192 .....	3	....	3	C.E. 150, 190, 182 .....	4	3	2
C.E. 173 .....	....	....	4	C.E. 198 .....	1	1	1
I.D. 112 .....	....	3	....	C.E. 130, 191 .....	3	1	....
E.E. 107 .....	....	4	....	C.E. 193 or I.D. 146.....	....	3	....
English 111 .....	4	....	....	C.E. 194 or I.D. 145.....	....	....	4
Approved Electives <sup>2</sup> .....	3	3	3	Options or Military .....	3	3	3
	18	18	18		18	18	16

**Senior Options**

General C.E.				Irrigation and Drainage			
Course	F	W	S	Course	F	W	S
C.E. 131, 125, 132.....	3	3	3	I.D. 149, 160, 147.....	3	3	3

**Courses**

**1, 2, 3. Engineering Orientation.** A preview of engineering; what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. (1F, 1W, 1S) **Christiansen**

**65. Engineering Problems.** Methods of computations include the use of logarithms, slide-rule, and calculating machines. Emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 35. One lab. (1F or 1S) **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, one lecture. (3W) **Tingey**

**81. Plane Surveying.** Primarily for Forestry students. Use of tape, hand level, level transit, compass and plane table. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math. 35 and 46. One lecture, two labs. (3F or 3S) **Tingey**

1—Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 Fall Quarter.

2—May be selected from the following: B.A. 109, Geol. 103, Pol. Sci. 20 or 182, C.E. 181, Bact. 70, Math. 122, Adv. Military or Air Science, or other courses approved by Major professor.

3—See note under course description, page 204.

**82. Mapping and Office Practice.** Practice in mapping various kinds of surveys that may be encouraged by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. One lecture, two labs. (3W) **Stock; Bishop**

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

**85. Advanced Surveying.** Problems in chaining, leveling, curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Two lectures, two labs. (4S) **Stock; Bishop**

**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 recommended. Summer employment in engineering or surveying may be substituted for the Summer Surveying Camp when approved by Head of the Department. Whenever possible, approval should be obtained in advance. Following the summer experience, a report must be submitted outlining work done, and giving appraisal of experience gained. Substitution will be allowed only when such report is submitted. Prerequisite: C.E. 85 or equivalent. Daily, eight hours a day for three weeks preceding Fall Quarter. (4Su) **TINGEY**

**101, 102, 103. Engineering Mechanics.** Includes statics, dynamics, and strength of materials. Fall Quarter and part of the Winter Quarter are devoted to study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and the kinematics and kinetics of bodies in translation, rotation and plane motion. The remainder of the year is devoted to study of properties of engineering materials, stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads and special topics. Prerequisite: Math. 99. Three lectures, one lab. (4F, 4W, 4S) **Watkins**

**105, 106, 107. Structural Theory and Design.** This sequence introduces the analysis and design of structures and their elements. C.E. 105 and 106 cover stress analysis and design in steel, timber, and reinforced concrete. In C.E. 107, students are given more comprehensive problems in the design of buildings and bridges. Prerequisites: Engineering Mechanics; C.E. 101, 102, 103. Fall and Winter Quarters, recitation daily, one lab. Spring Quarter, five recitations. (6F, 6W, 5S) **Kepler**

**108, 109, 110. Materials Testing Laboratory.** Strength, composition, and physical properties of engineering materials, including wood, concrete, metal and bituminous. One lab. (1F, 1W, 1S) **Watkins**

**111. Advanced Dynamics and Kinematics.** Kinematics of linkages, belts, gears and cams. Design of machine elements subject dynamic loadings. Two lectures, one lab. Prerequisite: C.E. 103. (3F) **Greaves**

**112. Stresses in Machine Elements.** A study of stresses in machine parts; theories of failure; statically indeterminate stresses and deflections; thermal stresses; stress concentration. Prerequisite: C.E. 103... Three lectures, on lab. (4W) **Greaves**

**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. (3F) **Stock**

**124. Street and Highway Traffic Control.** Collection and analysis of traffic data; causes and remedies for traffic congestions and accidents; traffic control devices; illumination of streets and highways; economics and administration of traffic control. Prerequisite: C.E. 120. Two lectures, one lab. (3F) **Stock**

**125. Highway Design.** Theory and practice in design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisites: C.E. 124. 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. Prerequisite: C.E. 124. (3S) **Stock**

**130. Building Construction and Cost Estimating.** Construction methods used in fabrication and erection of buildings and practice in estimating costs. (3F) 2 lectures, 1 lab. **Greaves; Kepner**

**131, 132. Structural Design Problems.** Problems in deflection of beams and trusses, analysis and design of statically indeterminate trusses and rigid frames. Open to seniors and to graduate students in Civil Engineering. C.E. 103 is prerequisite for C.E. 131 and C.E. 105 and 106 are prerequisites for C.E. 132 (3F, 3S) **Kepner**

**141, 152. 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: C.E. 196. Three lectures, one lab. (4W, 4S) **Greaves**

**144. Applied Hydraulics and Pneumatics.** Theory and practice of hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite: C.E. 141. Two lectures, one lab. (3S) **Greaves**

**150. Soil Mechanics.** Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and seepage, shear, stress, distribution, consolidation and stability as factors in the design of earth structures and foundations. Prerequisites: C.E. 103, 142. Three lectures, one lab. (4F) **Watkins**

**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) **Fuhrman**

**173. Hydrology and Meteorology.** The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, groundwater, and runoff methods of collection of hydrologic data and their use in water supply and flood control studies. Prerequisites: C.E. 142, or by special arrangement. Three lectures, one lab. (4S, 4W) **Fuhrman**

**176. Application of Thermodynamics.** For Air Conditioning, Aeronautic, and Automotive majors. Applications of laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigeration are studied. Prerequisites: Math. 35, 44; Physics 22. Three lectures. (3W) **Greaves**

**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: Ed. 63, C.E. 81 or 85, or Senior standing in Forestry, Range or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3S) **Tingey**

**182. Route Surveying.** Theory and practice in highway curves and earth work, including 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**

**191. Senior Project. Research.** Research or testing project in some phase of engineering. Student conducts minor research project under direction of faculty. Conducted cooperatively with C.E. 198 and English 111. (1W, 1S) **Staff**

**192. Engineering Economy.** Financial and cost problems associated with engineering design, operation and construction. Determination of the economic alternative in engineering. Prerequisite: Econ. 51. Three lectures. (3W) **Watkins**

**193. Municipal Water Systems.** Elements of design construction, and maintenance of waterworks systems. Treatment of public water supplies. Prerequisite: C. E. 142. Three lectures. (3W) **Kepner; Stock**

**194. Sewerage.** Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical and biological action and methods of final disposal. Prerequisite: C. E. 142. Three lectures, one lab. (4S) **Stock; 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 S)

**198, 199. Senior Seminar.** Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Seniors. One lecture. (1F, 1W, 1S) **Christiansen**

**201, 202. Advanced Structural Theory.** Review of elementary strength of materials; advanced topics in stress analysis involving central, torsional, and flexural loads. Open to graduate students in Civil Engineering and to qualified Senior students, with the approval of the instructor. (3F, 3W) **Kepner**

**203. Advanced Structural Design.** Individual problems in the design of modern structures. Checking of designs by model analysis may be selected. Prerequisite C. E. 133. (3F, 3W, or 3S) **Kepner**

**210. Earth and Rock-Fill Dams.** Design of flexible type (earth or rockfill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. Prerequisite: C. E. 150. (3W) **Milligan**

**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 miscellaneous types are also considered. For graduate students and specially prepared seniors. Time arranged. Prerequisite: C. E. 103 (3F) **Milligan**

**212. Appurtenances to Dams and Operation of Reservoirs.** Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. For graduate students and specially prepared seniors. Prerequisite: C. E. 142 (3S) **Milligan**

**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. (3W) **Greaves**

**220, 221, 222. Advanced Highway Engineering.** Economics of location and design; selection, improvement and maintenance; traffic control, administration and finance, and jurisdiction as applied to highways. Prerequisite: C. E. 125. (3F, 3W, 3S) **Stock**

**230. Special Problems in Civil Engineering.** Independent study of chosen problems in Civil Engineering, given under 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**

**241, 242. Advanced Fluid Mechanics and Hydraulics.** Effects of pressure, inertia, gravity, viscosity, compressibility, and surface tension on the motion of fluids. Surface resistance, form resistance, and lift and propulsion. Dynamic similarity. Non-uniform flow in open channels. Prerequisites: C. E. 142 and 196 or equivalents. (3F, 3W) **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) **Staff**

**250. Advanced Soil Mechanics.** Theories of seepage, capillarity, stress, consolidation, and stability are developed and applied to the practical design and construction of earth structures. Interpretation of laboratory tests is given special attention. For graduate students and specially prepared seniors. Prerequisites: Math. 122 and C. E. 150 or its equivalent. (3S) **Staff**

**251. Advanced Soil Mechanics Laboratory.** Advanced laboratory work in soil mechanics. (1S) **Staff**

**2298. Graduate Thesis.** Time and credit arranged. Each quarter. **Staff**

**273. Advanced Hydrology.** Application of basic hydrologic principles to engineering investigations. Application of the unit hydrograph, infiltration analysis, hydrograph analysis, streamflow routing for reservoir operation and control, and use and storage of groundwater. For graduates and specially prepared seniors. Prerequisite: C. E. 173 and senior standing in engineering. Three lectures. (3S) **Fuhrman**

**295. Sanitary Design.** Principles of design, construction, and operation of water purification and sewage treatment plants. Prerequisite: C. E. 193, 194. (3W) **Kepner**

**299. Graduate Seminar.** Time arranged. (1S) **Staff**

## Irrigation and Drainage Engineering

C. H. Milligan, Professor and Head of Department; J. E. Christiansen and O. W. Israelsen, Professors; A. Alvin Bishop and Dean K. Fuhrman, Associate Professors; Vaughn E. Hansen, Associate Research Professor; C. W. Lauritzen, Wayne D. Criddle, and Frank Haws, Collaborators, U. S. Department of Agriculture.

O. W. Israelsen, Professor Emeritus.

This department offers undergraduate courses for Agricultural Engineering and provides an option in Civil Engineering. A joint major in Irrigation and Soils is provided for students registering in the School of Agriculture.

A major function of the department is its graduate course offerings for Master of Science degrees in Agricultural Engineering, Civil Engineering, Irrigation and Drainage Engineering, and Irrigation and Soils. It also provides a two-year graduate curriculum for the professional degree of Irrigation Engineer, and collaborates with other departments in offering the Doctor of Philosophy degree in Irrigation Science.

A program of research is conducted 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 direction of the Agricultural Experiment Station. This, together with activities of the Engineering Experiment Station, provides opportunities for qualified students to act as part-time research assistants and thereby obtain experience and compensation for their services.

Utah State Agricultural College is located in the heart of the Irrigation regions of the West. Emphasis is placed upon basic principles of engineering applicable to the design, construction, operation and maintenance of irrigation systems, and upon the solution of problems related to irrigation agriculture.

The program of study for either the degree of Master of Science in Irrigation and Drainage Engineering or for the professional degree of Irrigation Engineer depends upon the student's previous training and experience. It should contain basic sequence courses to strengthen the undergraduate program and to provide adequate training in irrigation and drainage. Since students come to this institution



with different degrees of preparation and with different objectives, no rigid curricula can be suggested for advanced degrees. Typical programs of study for students having the Bachelor of Science degree in either Agricultural Engineering or Civil Engineering for the Master of Science degree in either Agricultural Engineering or Civil Engineering or for the Master of Science degree in Irrigation and Drainage Engineering or the degree of Irrigation Engineer are as follows:

### TYPICAL PROGRAMS OF STUDY FOR THE M.S. DEGREE IN IRRIGATION AND DRAINAGE ENGINEERING

Those with B.S. degree in A.E.

Course	Quarter		
	F.	W.	S.
C.E. 105, 106 .....	6	6	---
I.D. 112, 231, 232 .....	3	3	3
Agr. 207, I.D. 146, 148 ....	3	3	3
C.E. 299, I.D. 145 .....	1	---	3
I.D. 298 .....	2	4	6
	15	16	15

Those with B.S. degree in C.E.

Course	Quarter		
	F.	W.	S.
Agr. 207, C.E. 210, 273 ....	3	3	3
C.E. 241, 242, I.D. 245 ....	3	3	3
I.D. 112, 146, 147 .....	3	3	3
C.E. 299, I.D. 231, 232 ....	3	3	3
C.E. 298 .....	4	4	4
	16	16	16

\*Students who have had considerable professional experience may, on the approval of his graduate committee, substitute plan "B" reports for the Graduate Thesis. Most students will be required to satisfy the thesis requirement.

### TYPICAL PROGRAMS OF STUDY FOR THE DEGREE OF IRRIGATION ENGINEER

#### First Year

Those with B.S. degree in A.E.

Course	Quarter		
	F.	W.	S.
C.E. 105, 106, 173 .....	6	6	4
I.D. 112, 146, 147 .....	3	3	3
Agr. 130, 131, 132 .....	3	3	3
C.E. 150, Agr. 107, I.D. 145 .....	4	3	4
I.D. 298 .....	---	---	2
	16	15	16

Those with B.S. degree in C.E.

Course	Quarter		
	F.	W.	S.
Math. 130, 131, 132 .....	3	3	3
Agr. 130, 131, 132 .....	3	3	3
I.D. 112, 146, 147 .....	3	3	3
C.E. 241, 242, 243 .....	3	3	3
C.E. 201, 202 .....	3	3	---
C.E. 299, 298 .....	1	1	4
	16	16	16

#### Second Year

Those with B.S. degree in A.E.

Course	Quarter		
	F.	W.	S.
Math. 130, 131, 132 .....	3	3	3
I.D. 149, 160, 148 .....	3	3	3
C.E. 241, 242, 273 .....	3	3	3
I.D. 231, 232 .....	---	3	3
I.D. 298 .....	6	4	4
	15	16	16

Those with B.S. degree in C.E.

Course	Quarter		
	F.	W.	S.
C.E. 211, 210, 212 .....	3	3	3
I.D. 231, 232 .....	---	3	3
I.D. 149, 160, 245 .....	3	3	3
Agr. 207, C.E. 273, I.D. 148 .....	3	3	3
C.E. 298 .....	6	4	4
	15	16	16

These typical programs are suggestive only. Variations are permitted according to a student's previous training and his objectives so long as the general requirements of the department and of the Graduate School are satisfied. These general requirements are described under "Graduate School."



### Courses

**10. Irrigation for Agricultural Students.** Principles and practices underlying efficient and economic use of water in irrigation. Three lectures, one lab. (4F or S)  
**Bishop; Fuhrman**

**112. Irrigation Principles.** For advanced students in Agriculture or Engineering who have not taken I.D. 10. Principles of irrigation including soil, water, and plant relations, irrigation methods, irrigation efficiency, salinity, etc. Two lectures, one lab. (3F, S)  
**Fuhrman**

**I.D. 145. Design of Drainage Systems.** Drainage design in relation to soil properties, location of drains, flow into tile, properties of tile, drainage construction. Prerequisite: C.E. 142. Three lectures, one lab. (4S)  
**Bishop**

**I.D. 146. Design of Water Conveyance Irrigation Structures.** Application of principles of solid, fluid, and soil mechanics to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 106, 142, and 150. Three lectures. (3W)  
**Bishop**

**I.D. 147. Design of Water Control Structures.** Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: I.D. 146. Three lectures. (3S)  
**Bishop**

**I.D. 148. Design of Farm Irrigation Systems.** Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems, for application of water by both surface and sprinkling methods. Prerequisite: I.D. 146, 112 (3S)  
**Bishop**

**I.D. 149. Irrigation Institutions.** Laws governing acquisition, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; federal legislation affecting water. Three lectures. (3F)  
**Milligan**

**I.D. 160. Management of Irrigation Systems.** Details of staff organization for irrigation systems. Distribution of water to irrigators. Financing for construction and operation. Maintenance of canals, flumes, pipe lines, dams, weirs, and other irrigation structures. (3W)  
**Milligan**

**I.D. 231, 232. Irrigation Science.** Advanced study in irrigation including such topics as consumptive use of water; soil moisture; irrigation, erosion, and land management; infiltration; permeability; and other irrigation engineering principles and practices. (3W, 3S)  
**Fuhrman, Milligan**

**I.D. 241. Special Problems in Irrigation and Drainage Engineering.** Regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student projects. A qualified student may elect a problem in any phase of irrigation or drainage engineering for study at the college or elsewhere. This course also provides for research other than that for the graduate thesis. (I.D. 298 or C.E. 298). Credit according to work done. Each quarter. Time arranged.  
**Staff**

**I.D. 245. Advanced Design of Drainage Systems.** Measurements of field permeability, hydraulics of wells, pumping for drainage, leaching and reclamation of saline soils, etc. (3W)  
**Bishop**

**I.D. 298. Graduate Thesis.** Time and credit arranged. Each quarter. **Staff**

### Electrical Engineering

(Electronic and Communications Option)

Larry S. Cole, Professor and Head of Department; Clayton Clark, Professor; Bertis L. Embry, Bruce O. Watkins, Associate Professors; William L. Jones, Assistant Professor.

The course of study offered by the Department of Electrical Engineering has been designed with emphasis in Electronics and Communications. The curriculum thus permits both a wide range of courses and thorough treatment of the work in these fields at the undergraduate level. At the same time, provision is made for inclusion of a sufficient number of basic engineering courses to provide a well-rounded engineering education.

The objective of the curriculum is to provide the necessary background and training to enable the student, on graduation, to qualify for positions available in Electronics and Communications. Former graduates have found excellent employment opportunities and have been successful in the following general fields: electronic research and development, broadcast and communications (including television), electronic and radio manufacturing industry, and industrial electronics. Positions in these and related occupations have been available in both Civil Service and private industry.

Departmental courses provide a maximum possible amount of laboratory experience; the senior laboratory program duplicates, as closely as possible, actual types of work the student may expect to perform after employment; e.g., carrying out typical engineering assignments in design, development and testing with a minimum of direction.

Laboratory facilities available in the department of Electrical Engineering include: Communications laboratory with transmitters up to 1000 watts and modern communication receivers (W7TMK) radar laboratory with Mark-16 50-KW cm. set; UHF laboratory, including 10, 3 and 1 cm. equipment; field antenna laboratory for study on full scale broadcast and communication systems; broadcast studio with audio control and recording equipment; instrument rooms for measurement work; electrical machinery laboratory.

A graduate course of study leading to the M.S. degree in E.E. including courses numbered 200 and over together with suitable related work in other departments is offered. A typical program is listed below. This suggested course of study may be modified as required depending on the individual student problems.

### ELECTRICAL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Electrical Engineering  
(Electronics and Communications Option)

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
C.E. 1, 2 .....	1	1	---	E.E. 79, 80, 81 .....	4	5	5
E.E. 26 .....	---	---	1	Math. 97, 98, 99 .....	5	5	5
C.E. 65 .....	---	---	1	Physics 20, 21, 22 .....	5	5	5
Math. 34, <sup>1</sup> 35, 46 .....	3	5	5	C.E. 84 .....	4	---	---
E.D. 61, 62, 63 .....	3	3	3	Speech 5 .....	---	---	3
English 17, 18, 19 .....	3	3	3	Economics 27 .....	---	3	---
Chem. 10, 11 .....	5	5	---	M.S. or A.S. ....	1	1	1
T.E. 56 .....	---	---	3				
M.S. or A.S. ....	1	1	1				
	16	18	17			19	19
Junior				Senior			
Course	F	W	S	Course	F	W	S
E.E. 124, 125, 126 .....	5	5	5	E.E. 131, 129, 120 .....	3	5	5
E.E. 107, 108, 110 .....	4	4	4	E.E. 139, 140, 141 .....	3	5	5
C.E. 101, 102, 103 .....	4	4	4	E.E. 151, 152 .....	2	2	---
Math. 120 .....	3	---	---	E.E. 160, 142 .....	4	3	---
E.E. 150 .....	---	2	---	E.E. 175, 176, 177 .....	1	1	1
Electives or A.S. ....	3	3	3	C.E. 196 .....	---	---	4
				English 111 .....	4	---	---
				Electives or A.S. ....	3	3	3
	19	18	16			20	19
						18	18

<sup>1</sup>—Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.

**Suggested Course of Study Leading to the Degree of  
Master of Science in Electrical Engineering**

Course	Quarter		
	F	W	S
E.E. 211, 212 .....	4	4	---
E.E. 231, 251 .....	3	---	4
E.E. 222, 223 .....	---	3	3
E.E. 200 (thesis) .....	---	5	5
Math 257, 258, 259 .....	3	3	3
Approved elective .....	5	---	---
	15	15	15

**Courses**

**21. Fundamentals of Electricity.** A service course for students in Industrial Arts, Automotive, Welding, etc. Basic principles of practical and applied electricity; DC and AC circuits; power; wire and wiring; motor, generator and transformer principles; batteries; meters. Prerequisites: Math. 34 or equivalent. Three lectures, one demonstration lab. (4F, 4W, 4S) **Staff**

**26. Electrical Engineering Orientation.** Gives the beginning student a preliminary view of the nature of the work to follow. Laboratories are visited to acquaint the student with the units and types of equipment with which he will work. Basic components used in electrical and electronic equipment are explained and demonstrated. One lab. (1S) **Staff**

**79. Introduction to Electrical Engineering.** Covers basic electricity and magnetism; Ohm's Law and circuits; circuit components; batteries, motors and generators; alternating currents; electron tubes and circuits; communication systems. Laboratory includes basic training in construction, testing, and operation of electrical and electronic equipment. Prerequisite: Math. 46. Three lectures, one lab. (4F) **Jones**

**80. Direct Current Circuits.** Applications of Ohm's law, Kirchoff's laws, and network theorems to the solution of resistive circuits; introduction to magnetic and electric fields and circuits. Prerequisite: (or concurrent registration in) Math. 98. Three lectures, two labs. (5W) **Jones**

**81. Alternating Current Circuits.** Fundamentals of AC; application of vector algebra to solution of AC circuits; application of network theorems to AC circuits; resonant circuits; introduction to reactive matching networks; elements of complex wave analysis. Prerequisite: E.E. 80. Four lectures, one lab. (5S) **Jones**

**E.E. 101 Electronics.** A special course for senior or graduate science majors and non-electrical engineers. Fundamentals of electric and electronic circuits; applications to the electrical measurement of physical quantities. Prerequisites: Physics 21 and elementary calculus. Three lectures, 1 lab. (4F) **Jones**

**107. Electrical Machinery I.** An introductory course covering principles and operation of DC and AC machines; transformers; power transmission and distribution. Prerequisites: Physics 21 and Math. 99. Three lectures, one lab. (4F, 4W, 4S) **Embry**

**108. Electrical Machinery II.** A continuation of E.E. 107 with special emphasis on AC machinery. Single and polyphase systems and machines; transformers; control equipment. Three lectures, one lab. (4W) **Embry**

**110. Lines and Filters.** Principles and characteristics of transmission lines, networks, matching sections and filters. Prerequisite: E.E. 81. Three lectures, two labs. (5S) **Cole**

**120. Antennas.** Fundamentals of radio antennas, radiation and wave propagation; directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisite: E.E. 110. Three lectures, two labs. (5S) **Clark**

**124. Electron Tubes.** Fundamentals of thermionic emission and operation of vacuum and gas-filled tubes; basic principles and methods of analysis of electron

tube circuits; measurements and testing in electronic circuits; elements of power supply design. Prerequisite: E.E. 81. Three lectures, two labs. (5F) Jones

**125. Electron Tube Circuits I.** Principles and design of R-C and transformer coupled amplifiers; class A, AB, and B power amplifiers; principles of inverse feedback; distortion and gain measurement techniques. Prerequisite: E.E. 124. Three lectures, two labs. (5W) Cole

**126. Electron Tube Circuits II.** Principles and design of RF voltage and power amplifiers; neutralization methods; modulation; RF oscillators; detectors. Prerequisite: E.E. 125. Three lectures, two labs. (5S) Jones

**129. Electroacoustics.** Elements of architectural acoustics; principles of direct radiator and horn loudspeakers; microphones and pickups; recording equipment and methods; audio system planning and design; acoustic and special audio measurement problems. Prerequisite: E.E. 125. Three lectures, two labs. (5W) Cole

**131. Transient Analysis.** Elementary study of transient phenomena in linear systems; formulation of differential equations and their solutions. Includes an introduction to the Laplace transform method of solution. Prerequisites: E.E. 110 and Math. 122. (3F) Cole

**139. Fundamentals of Electric Waves.** Introduction to vector analysis; elementary electromagnetic field theory; Maxwell's equations; radiation and wave guides. Prerequisites: E.E. 110 and Math. 122. (3F) Clark

**140. UHF Circuits.** Principles and design of pulse and wide-band RF amplifiers; transmission networks for UHF modulating signals; regulated power supplies; oscilloscope measurements; application of transmission line theory in the UHF spectrum. Prerequisite: E.E. 131, 139. Three lectures, two labs. (5W) Clark

**141. UHF Techniques.** UHF generators, cavity resonators, wave guides; parabolic and horn radiators; applications of UHF transmissions to radar and other complete systems. Laboratory work includes study and operation of the complete Mark 16 10 cm radar set. Prerequisite: E.E. 140. Three lectures, two labs. (5S) Clark

**142. Television and F.M. Systems.** A survey of the elements of present television and F. M. transmission and receiver systems; principles of other special systems as facsimile and teletype. (3W) Clark

**150. Instruments and Measurements.** A laboratory course covering the principles and application of electrical and electronic instruments; methods and techniques of measurements. Prerequisite: E.E. 124. Two labs. (2F or W) Jones

**151., 152, 153. Advanced Laboratory.** Individual engineering assignment involving design, development, construction and testing of various types and units of electronic and communications equipment. Prerequisite: Senior standing in E.E. Two labs. (2F, 2W, 2S) Cole; Clark

**160. Industrial Electronics.** Application of electronics methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms, R. F. heating. Prerequisite: E.E. 126. Three lectures, one lab. (4F) Clark

**175. E.E. Seminar.** A weekly meeting of staff and senior E.E. majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents a technical paper on a suitable topic. (1F, 1W, 1S) Staff

**200. Special Studies in Electrical Engineering.** Preparation of professional papers and reports, research, and special problems. Open to senior E.E. students of high standing or graduate students. Time and credit arranged. Staff

**211, 212. Advanced Electron Tube Circuits.** Pulse techniques and recurrent electrical transients. Generator, trigger, multivibrator and similar circuit theory and design. Theory and design of high-speed pulse amplifiers. Wideband and band-pass amplifiers. Amplifier noise problems. Prerequisite or concurrent registration in EE 221 or equivalent. Three lectures, one lab. (4F, 4W) Staff

**222, 223. Network Synthesis.** The mathematical basis and design methods for two and four terminal passive networks having physically realizable driving point immittances. Prerequisite Math. 254 and EE 131. Three lectures. (3W, 3S) Staff

**231, 232, 233. Electromagnetic Waves and Fields.** Vector analysis, field theory and Maxwell's equations. Field equation and boundary value problems. Application to antennas, wave guides and propagation. Three lectures. (3F, 3W, 3S) Staff

**251. Servo-Mechanisms and Automatic Controls.** Basic theory and design of servo systems. Transient response and stability problems. Computer fundamentals. Prerequisite: EE 131 or equivalent. Three lectures, one lab. (4S) Staff

## Tool Engineering

**Frederick Preator**, Professor and Head of Department; **Rawson D. Child**, Assistant Professor.

The department offers a four-year curriculum that leads to the degree of Bachelor of Science in Tool Engineering. The present demand for capable tool engineers is greater than the supply of personnel qualified to take over production responsibilities.

Tool Engineering is a specialized branch of engineering devoted primarily to planning the processes of economic manufacture; the art and science of analyzing, planning, designing, construction, and producing tools for manufacturing industries. The tool engineer handles the more specialized activities of process engineering, machine design, tool design, plant and layout engineering, gage engineering, manufacturing cost estimating, machine tool building, and maintenance engineering.

The Tool Engineering laboratories are equipped with eighteen engine lathes, three universal and one vertical milling machine, one planer, three shapers, four precision tool grinders, six drill presses, five tool grinders, one carbide tool grinder, one Doall machine, two punch presses, and one power hack saw. The laboratory is well supplied with all the necessary hand tools for precision work. The heat treatment laboratory is equipped with five electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. A modern inspection laboratory has gage blocks, sine bars, electric comparators, polishing heads and microscopes for mechanical inspection work.

A joint program of cooperative training with Utah industries has been worked out for advanced students which permits registration for summer periods.

Members of the teaching staff are qualified members of the American Society of Tool Engineers, and the department sponsors a Tool Engineering club affiliated with the National Society. Field trips to industrial plants are conducted each year for junior and senior students.

### TOOL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Tool Engineering

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
C.E. 1, 2, 65 .....	1	1	1	Math. 97, 98, 99 .....	5	5	5
T.E. 50 .....	....	....	1	Physics 20, 21, 22 .....	5	5	5
T.E. 56 .....	....	....	3	T.E. 52, 53 .....	4	4	....
Math. 34 <sup>1</sup> , 35, 46 .....	3	5	5	T.E. 57, 58 .....	....	2	2
English 17, 18, 19 .....	3	3	3	Econ. 50 .....	3	....	....
E.D. 61, 62, 63 .....	3	3	3	Speech 5 .....	....	....	3
Chem. 10, 11 .....	5	5	....	M.S. or A.S. ....	1	1	1
M.S. or A.S. ....	1	1	1				
	16	18	17		18	17	16

<sup>1</sup>—Students who have completed high school Algebra B and and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.



Junior				Senior			
Course	F	W	S	Course	F	W	S
T.E. 151, 152, 153 .....	4	4	4	T.E. 181, 182, 183 .....	5	5	5
T.E. 150 .....	3	---	---	E.D. 95, 195, 196 .....	3	3	3
C.E. 101, 102, 103 .....	4	4	4	C.E. 111, 112, 192 .....	4	3	3
C.E. 141, 144 .....	---	4	3	T.E. 184, 158 .....	---	1	3
E.E. 107, 108 .....	---	4	4	B.A. 155 .....	3	---	---
Welding 96 .....	3	---	---	English 112 .....	---	4	---
Electives .....	3	3	3	Approved Electives .....	3	3	3
<hr/>				<hr/>			
17 19 18				18 19 17			

### Courses

**50. Orientation.** Lectures, films, and field trips to acquaint the student with diverse opportunities for the tool engineer in industry. (1S) **Staff**

**51, 52. Machine Tool Operation.** Training in use of hand tools, and in bench work and tool sharpening, together with elementary training on drill press and engine lathe. Reading assignments on machine tool operations, and applications of mathematics to machine tool problems are included. (5F, W or S) **Child**

**53. Machining Processes.** (Shaper and Milling Machines) Introduction to work on the shaper, planer, and milling machines prepares the student for advanced operations. (4F, W) **Preator**

**56. Machine Practice for Engineers.** Acquaints engineering students with basic machine tool operations. (3S) **Child**

**57. Precision Control.** Theory and practice of precision measurement are 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.** Teaches the student the fundamentals of such manufacturing processes as foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; shows possibilities and limitations of these processes and their application to fabrication of industrial products. (2S) **Child**

**150. Metals and Heat Treatment.** Physical properties, composition, constituents, and heat treatment of metals used in industry, including cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. Prerequisite: Chemistry 10. Two lectures, one lab. (3F) **Preator**

**151. Tooling Operations.** Develops for the student an understanding of the capacity and the versatile usefulness in production operations of turrets, milling machines, and precision grinding equipment. Prerequisites: T.E. 51, 52, 53. Two lectures, three labs. (5F, W) **Preator; Child**

**152. Tool Planning.** Analyzes machining processes and organization of operational sequence. Tool planning procedures and routing for production control. Prerequisites: T.E. 151. Two lectures, three labs. (5W) **Child**

**153. Tool Processes.** Introduction to tool and gage and die processes. The student studies and makes specialized tools and equipment necessary for the design and construction of projects in the tool and die industry. Required of all major students. Two lectures, three labs. (5S) **Child**

**158. Manufacturing Analysis.** Economics of tooling operations; the productivity of machines, different tooling methods, fabrication techniques, breakdown of operations, tool maintenance, tool costs, and job estimating. (3S) **Staff**

**181, 182, 183. Tool Design.** The study and design of such production tools as gages, jigs and fixtures, punches and dies. Includes tool design standards, toler-



ances, springs, details of jigs, cam layouts, and techniques of preparing tool drawings. Each student designs and constructs a set of tools for production of a specific workpiece. Emphasis on development of creative ability and originality. Prerequisite: C.E. 103. Two lectures, three labs. (5F, 5W, 5S) **Preator; Child**

**184. Seminar.** A review of current technical literature dealing with the latest production methods. Oral and written reports presented for discussion. (1W, or S)

**185, 186. Co-operative in Plant Training.** A co-operative training course conducted by the college and industry to supplement the student's academic work with plant experience and to qualify him for industrial opportunities. Arranged (6) **Staff**

### Two-Year Curriculum Leading to Certificate of Completion in Machine Tool Technology

The two-year terminal curriculum prepares young men who have mechanical interests and abilities to become skilled craftsmen and technicians. Operations performed in the two-year terminal course are the same as those required in industrial shops. Mechanical drawing and blueprint reading are essential in the Machine Tool curriculum. Capable and efficient craftsmen are rarely out of employment in the manufacturing industries.

First Year				Second Year			
Course	F	W	S	Course	F	W	S
English 17, 18, 19 .....	3	3	3	T.E. 54, 151, 152 .....	5	5	5
T.E. 51, 52, 53 .....	5	5	5	E.D. 63, 95 .....	3	3	...
Math. 34, 35, 44 .....	3	5	3	T.E. 57, 58 .....	...	2	2
E.D. 61, 62, 93 .....	3	3	3	Weld. 91, 94 .....	3	...	3
P.S. 20, Speech 5 .....	3	...	3	Phys. Sc. 31, 32 .....	...	5	5
M.S. 1, 2, 3 .....	1	1	1	Physiol. 4 .....	5	...	...
				M.S. or A.S. ....	1	1	1
	18	17	18				
					17	16	16

### Engineering Experiment Station

J. E. Christiansen, Director

By act of the Board of Trustees of the Utah State Agricultural College, December 2, 1918, the Utah State Engineering Experiment Station was established to serve the State in a manner broadly outlined as follows:

(1) To serve those industries and utilities affecting the agricultural and rural populations of the State and to aid public officials and teachers by making engineering investigations of significance and interest to them.

(2) To further the development of methods of processing and use of waste products from agriculture.

(3) To develop methods of processing and making available for use the undeveloped agricultural and industrial raw materials of the State.

(4) To further develop the science of Irrigation and Drainage to the end that the land and water resources of the State may be most fully utilized.

(5) To stimulate a greater use of native materials in rural housing and farm structures.

(6) To develop applications and uses of power equipment and to help solve problems relating to the water supply and sanitation of the farm home.

(7) To develop new tillage, harvesting, and weed control equipment.

(8) To develop new methods and uses of native materials in the construction of farm-to-market roads and highways.

(9) To cooperate with the Federal government in the conducting of investigations along these and other lines of engineering in harmony with the functioning of the Land-Grant College.

(10) To publish and distribute through bulletins, circulars, and technical articles in periodicals the 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.

## DIVISION OF TECHNOLOGY

The Division of Technology includes six departments: Aeronautics, Air Conditioning and Refrigeration, Automotive, Industrial Education, Woodwork and Building Construction, and Welding. Beginning as a Department of Mechanic Arts in 1888, the division has expanded and developed as a result of efforts of the College to provide for the "liberal and practical education of the industrial classes" as outlined in the original charter for Land-Grant Colleges and Universities.

This division offers three major programs:

**I. Industrial Technology Program.** Present-day industry requires services of engineers, technicians, and skilled craftsmen. The Industrial Technology program is a four-year technical program leading to the degree of Bachelor of Science in Industrial Technology. The training provided combines technical knowledge and manual skills with a broad general college education. This program prepares technicians for technical, supervisory, or managerial positions in modern industry and is an excellent foundation for entrance into industrial Civil Service positions, or for private business. Prescribed curricula under this program are described under the departments in which they are offered.

**II. Industrial Education Program.** This program, offered by the Department of Industrial Education, gives professional training for teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and the Summer Season. Completion of the under-graduate curriculum leads to the degree of Bachelor of Science in Industrial Education with majors in Industrial Arts Education for junior and senior high school positions, and Trade and Industrial Education for junior college and vocational school positions.

Graduate study leading to the degree of Master of Science in Industrial Education is also offered.

**III. Vocational Technical Program.** This program prepares skilled technicians for modern industry. Completion of the two-year curricula, listed under the departments in which they are offered, leads to a Certificate of Completion in the specific field. This program is briefer and more specialized than the degree program.

This program is offered in close co-operation with the State Department of Public Instruction, and with industry. Problems of training and placing of students are considered jointly with advisory committees representing the trade. Instruction covers the practices of industry with emphasis on latest methods, modern equipment, and live productive work. The instructors all have years of successful trade experience in their field.

The Vocational Technical Program offers many distinct advantages to students desiring terminal education. Students completing this program are not only well prepared with the skills of their trade to enter modern industry, but they are also prepared, through their association and activities on a college campus, to take their place in society. Students entering industry from this training program have oppor-

tunities for further progress and advancement in industry, as has been demonstrated by many industrial leaders. By returning to this institution for further training, qualified students may apply most of the credit earned under this program toward a degree, and thus better prepare themselves for supervisory and managerial positions.

The Division of Technology, as an integral part of a Land-Grant College of Agriculture and Mechanic Arts, is providing the types of training specified in the Morrill Act of 1862, establishing the Land-Grant Colleges.

## Aeronautics

**H. A. Buntine**, Associate Professor and Head of Department; **Lowell P. Summers**, Assistant Professor; **Louis Klein, Jr.**, Instructor.

This department offers instruction for thorough training of skilled 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 Airframe and Aircraft Engine mechanics. The curricula, equipment, and instructors have been properly certified in compliance with regulations for the training of Airframe and Aircraft Engine Mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Airframe and Aircraft Engine Mechanic Ratings. This training prepares graduates for both airframe 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. Students graduating in the four-year curriculum are required to have successfully accomplished the written and practical C.A.A. examinations for Airframe and Aircraft Engine Mechanic ratings.

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. Also included are electro-plating, 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

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
Aero. 5, 6, 7.....	5	5	5	Aero. 8, 9,, 10 .....	5	5	5
Aero. II .....	.....	.....	1	Aero. 58, 59, 60 .....	5	5	5
Aero. 55, 56, 57 .....	5	5	5	Aero. 12 .....	.....	.....	1
Math. 34*, 35, 44* or 46....	3	5	3	English 17, 18, 19 .....	3	3	3
Weld. 92 .....	.....	3	3	E.D. 61, 62 .....	3	.....	3
T.E. 51 .....	3	.....	.....	C.E. 65, E.E. 21 .....	1	4	.....
M.S. or A.S. ....	1	1	1	M.S. or A.S. ....	1	1	1
	17	19	18		18	18	18

\*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.

Junior				Senior			
Course	F	W	S	Course	F	W	S
Aero. 100, 104, 105.....	3	3	3	Aero. 101, 132, 126 .....	3	3	2
Phys. 17, 18, 19 .....	5	5	5	Aero. 37, 131, 133 .....	3	2	2
Chem. 10, 11 .....	5	5	---	Econ. 125 .....	3	---	---
E.D. 93, 95, 63 .....	3	3	3	B.A. 109, 147, 148 .....	3	3	3
Eero. 134 .....	---	---	4	English 111 or 112 .....	---	4	---
				E.D. 196 .....	---	---	3
				T.E. 150 .....	3	---	---
				C.E. 176 .....	---	---	3
				Approved Electives .....	---	5	3
	16	16	15				
						15	17 16

Two-Year Vocational Technical Program  
Certificate of Completion in Aircraft and Engine Mechanics

First Year				Second Year			
Course	F	W	S	Course	F	W	S
Aero. 5, 6, 7 .....	5	5	5	Aero. 8, 9, 10 .....	5	5	5
Aero. 55, 56, 57 .....	5	5	5	Aero. 58, 59, 60 .....	5	5	5
Math. 34* .....	3	---	---	English 17, 18, 19 .....	3	3	3
T.E. 51 .....	3	---	---	E.D. 61, 62 .....	3	---	3
Weld. 92, 93 .....	---	3	3	E.E. 21 .....	---	4	---
M.S. 1, 2, 3 .....	1	1	1	M.S. or A.S. ....	1	1	1
Ind. Ed. 21 .....	---	---	3				
Approved Electives .....	---	3	---				
						17	18 17
	17	17	17				

**Courses\*\***

**5, 55. Composite Aircraft Structures.** (Technical and Shop Design, construction, repair, and maintenance of composite aircraft, including wood structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air regulations. (Tech. 5; Shop 5; F) Klein

**6, 56. All-Metal Aircraft Structures.** (Technical and Shop) 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. Adaptation of stressed skin aircraft construction; 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, 57. Aircraft Maintenance.** (Technical and Shop) The maintenance, repair, and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, instruments, electrical equipment and installation, and general servicing of components; rigging, weight and balance computations, periodic inspections, recording of repairs and alterations, time and material cost estimates, material and equipment requirements. Pertinent Civil Air regulations are studied. (Tech. 5; Shop 6; S) Klein

**8, 58. Aircraft Powerplants...** (Technical and Shop) 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, cylinder and valve mechanisms, and pertinent Civil Air regulations. Basic related material includes a study of

\*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.

\*\*First number is for Technical or lecture course, second number for Shop or laboratory course.

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 6; F) **Summers**

**9, 59. Aircraft Powerplant Accessories.** (Technical and Shop) 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, 60. Aircraft Powerplant Maintenance.** (Technical and Shop) Training in repair and alteration, maintenance, and operation of modern aircraft powerplants, including periodic inspections, maintenance servicing, diagnosis of engine manufacturing; engine installation, test and servicing; installation and maintenance of propellers, hydromatic, constant speed, controllable and wood; use of special tools; engine repair and alteration; time and material costs; and pertinent Civil Air regulations. (Tech. 5; Shop 5; S) **Summers**

**11. Aircraft Mechanic Problems.** Relating to C.A.A. regulations and procedures and changes in the industry. Prerequisite: Aero. 7 (1S) **Klein**

**12. Aircraft Engine Mechanic Problems.** Relating to C.A.A. regulations and procedures and changes in the industry. Prerequisite: Aero. 10. (IS) **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. (3F) **Buntine**

**101. Flight Engineering.** Principles underlying relationships between altitude, power output, airplane performance, and the use of engine power curves, takeoff and climb charts, cruising charts and flight logs. (4S) **Summers**

**104. Advanced Aircraft Design and Construction.** Latest methods in design and manufacturing of stressed skin aircraft. Correction of design requirements and manufacture. Pertinent Civil Aeronautics Administration regulations covering design. (3W) **Buntine**

**105. Aircraft Woods and Plastics.** Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria, applications of elastic theory, and effects upon structural analysis. (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. (2W) **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.** Techniques of time and motion study and their inter-relationships. Detailed discussion and practice with process charts, multiple-activity charts, micromotion study. Therblig check list, motion economy and stopwatch time study. Methods of application and personnel problems involved. (2W) **Klein**

**132. Airport Planning.** The airport and the community. Present and future aircraft. Airway and airport traffic control. Airport types, fundamental airport requirements. Airfield planning and construction. Lighting. Building and hangar design. Special services. Special problems and miscellaneous facilities. (3S) **Buntine**

**133. Certificated Repair Station Operation.** Operation of an approved C.A.A. repair station. (2S) **Klein**

**34. Navigation.** Maps, charts, and navigational problems. Required by the systems used in larger aircraft. Three lectures, 2 labs. (4W) **Summers**



### GROUND SCHOOL COURSES

**31. Civil Air Regulations, Radio and Airway Procedures.** Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Two lectures. (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**

**34. Navigation.** Maps, charts, and navigational problems. Required by the C.A.A. for any pilot rating above private. (3F, W or S) **Buntine**

**135. Aeronautical Ground School (Advanced).** Intensive course in aircraft, aircraft engines, propellers, construction, inspection, and general maintenance. Prerequisite: Aero. 32. (5W) **Buntine**

### FLIGHT COURSES

Students interested in flight courses should take Physics 16, Introductory Meteorology, which is required by C.A.A. for pilot rating above Private Pilot Certificate.

**37. Private Pilot Certificate.** Flight school Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for 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**

**138. Flight Instructor Certificate.** Flight School (advanced). Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certificate. Prerequisite: Aero 137. (2F, W or S) **Staff**

### Automotive Technology

**Owen Slaugh**, Assistant Professor and Head of Department; **Vern R. Beecher** and **Lynn R. Willey**, Assistant Professors; **Clyde Hurst** and **Ivan E. Lee**, Instructors.

This department offers a Bachelor of Science Degree in Industrial Technology with majors in Automotive Technology, Auto Body Reconditioning, or Diesel Technology. It also provides general service courses for students in other departments who desire to become familiar with various phases of automobile education. In cooperation with the Industrial Education Department courses are offered in Driver Education Teacher Training.

Training facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the most modern servicing and testing equipment, and provide ideal conditions for study.

A major in Automotive, Diesel, or Auto Body Technology prepares a student to be a technician who can better interpret the designs of the engineers and direct the work of repairmen. This major also prepare students to become shop foremen, shop superintendents, and with special preparation, school instructors. Excellent background is provided for entrance into civil service, private business, and managerial positions with large companies.

Students desiring to more thoroughly prepare themselves for advanced or graduate study in Automotive or related engineering may do so by substituting mathematics and engineering courses during their junior and senior years.



**CURRICULUM**

Degree: Bachelor of Science in Industrial Technology  
Major: Automotive Technology

Course	Freshman		
	F	W	S
Auto 1, 2, 3 .....	6	6	6
Math. 34 <sup>a</sup> , 35, 44 .....	3	5	3
English 17, 18, 19 .....	3	3	3
E.D. 61, 62, 93 .....	3	3	3
C.E. 65 .....	...	...	1
M.S. or A.S. ....	1	1	1
	16	18	17

Course	Sophomore		
	F	W	S
Auto 4, 5, 6 .....	6	6	6
Physics 17, 18, 19 .....	5	5	5
Weld. 91, 94 .....	3	3	...
T.E. 51 .....	...	3	...
E.E. 21 .....	4	...	...
Auto 54 .....	...	...	3
M.S. or A.S. ....	1	1	1
	19	18	15

Course	Junior		
	F	W	S
Auto. 101, 102, 103 .....	3	3	3
Auto. 61, 162 .....	3	3	...
Econ. 51 .....	5	...	...
Chem. 10, 11 .....	5	5	...
Weld. 190 .....	...	3	...
C.E. 176 .....	...	...	4
English 112 .....	...	...	4
I.E. 120 Psy. 155 .....	...	...	3
Electives or M.S. ....	3	3	3
	19	17	17

Course	Senior		
	F	W	S
Auto. 151, 152, 154 .....	3	3	3
P.H. 155 or Zoo. 111 .....	...	3(4)	...
Econ. 125 .....	3	...	...
Aero. 131 .....	...	3	...
I.E. 113 .....	...	...	3
B.A. 109, 147, 148 .....	3	3	3
T.E. 150 .....	...	...	3
A.E. 82 .....	...	2	...
Chem. 125 .....	5	...	...
Electives or M.S. ....	3	3	3
	17	17	15

**Diesel Technology Major**

Substitute Auto 21, 22, 23, 121, 122, and 123 for Auto 1, 2, 3, 101, 102, 103.

**Auto Body Reconditioning Major**

Substitute Auto 52, 53, for Auto 2; Auto 12, 13, and 16 for Auto 4, 5, 6; and Auto 113 for Auto 102. Interchange E.D. 62 and 93 with Weld. 91 and 94.

**Two-Year Vocational Technical Program**

Certificate of completion in Automotive Repair, Diesel and H. D. Mechanics, and Auto Body Reconditioning will be granted, upon application and payment of diploma fee, to students completing the Freshman and Sophomore years of the respective curricula.

**Service Courses**

Courses open to any students: Auto 51, 52, 53, 54, 61, 62 and 162.

**Courses**

**1. Steering Correction.** (Technical and Shop) Construction, operation, and repair of all parts of the automobile chassis. Units studied are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, and hydraulic brakes. Modern methods of repair. (6F) **Lee**

<sup>a</sup>Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 Fall Quarter.

**2. Automotive Engines.** (Technical and Shop) Construction, operation, and repair of the modern automobile engine, including cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. (6W) **Lee**

**3. Driving Mechanisms.** (Technical and Shop) Construction, operation, and repair of clutches, transmissions, overdrives, universal joints, drive shafts, differentials and rear axles. Modern methods of repair. (6S) **Beecher; Lee**

**4. Fuel Systems.** (Technical and Shop.) Construction, operation, and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls and such special devices as superchargers, governors, and auto diesel engine fuel systems. Modern methods of repair. (6F) **Slaugh**

**5. Auto Electrics.** (Technical and Shop) Construction, operation, and repair of electric systems used on modern automotive equipment, including the battery, lighting systems, ignition systems starting and generating systems. Modern methods of repair. (6W) **Beecher**

**6. Motor Tune-Up.** (Technical and Shop.) Correlates the work covered on engines, carburetion and electrics. Tests for troubles are made with modern tune-up equipment; these troubles remedied by trade-accepted methods. Prerequisites: Auto 2, 4, 5. (6S) **Slaugh; Beecher**

**12. Fender Reconditioning.** (Technical and Shop.) Roughing out, shrinking, leading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfacers. (6F) **Whilley**

**13. Body Reconditioning.** (Technical and Shop.) Construction and repair of automobile bodies. Units include checking and alignment of automobile bodies and repair and replacement of damaged body panels such as the dash, cowl, trunk, rocker, floor, side, top and door panels. Prerequisite: Auto 12. (6W) **Whilley**

**16. Automotive Refinishing.** (Technical and Shop.) Preparation of body metal and application of lacquer and synthetic enamels, including metal preparation, priming, surfacing, and application of color. Practice in spotting, striping, and graining. (6S) **Whilley**

**21. Heavy Duty Chassis.** (Technical and Shop.) Construction, operation, and repair of automotive diesel and heavy-duty chassis. Units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (6F) **Hurst**

**22. Automotive Diesel Engines.** (Technical and Shop.) Construction, operation, and repair of automotive diesel engines, including two-stroke cycle and four-stroke automotive, truck and tractor engines and their accessories. (6W) **Hurst**

**23. Heavy-Duty Drives.** (Technical and Shop.) Construction, operation, and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (6S) **Hurst**

**51. Automobile Chassis.** Principles and practice in construction, operation, and servicing of the modern automobile chassis. Units of the course include axle, wheel suspension, steering gears, frames, springs, universals, drive shafts and brakes. Open to any college student. Two lectures, two 2-hr. labs. (3F) **Hurst**

**52. Automobile and Farm Power Plants.** Principles and practice in construction, operation and servicing of the modern automobile and farm power plants. Units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmission, overdrive, fuel, cooling and lubrication systems. Two stroke, four stroke and diesel cycles considered. Open to any college student. Two lectures, two 2-hr labs. (3F, W, S) **Lee**

**53. Automobile and Farm Engine Electricity.** Principles and practice in the construction, operation, and servicing of electrical systems used on modern automobiles and farm engines. Units studied include starting, generating, lighting, ignition, and special accessory systems. Open to any college student. Two lectures, two 2-hr. labs. (3S) **Slaugh**

**54. Service Techniques.** Theory and practice in service station and shop management records. Professional ethics. Selling and installing automobile accessories. Minor repairs and lubrication. (3W, S) **Lee**

**61. Body and Fender Repair.** Principles and practice in fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. Two lectures, two 2-hr. labs. (3F, S) **Willey**

**62. Upholstering.** Principles and practice in 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. (3S) **Willey**

**101. Frame Suspension and Steering Systems.** (Technical and Shop.) Geometry and design factors of the various types of steering units including power steering, wheel balancing, frame alignment, and power brakes are studied in relationship to steering facility. Prerequisite: Auto 1, Math. 34, 44. (3W) **Hurst**

**102. Internal Combustion Engines.** (Technical and Shop.) Design and operational characteristics of different engine types. Attention is given such items as combustion chamber design, precision cylinder and bearing boring, engine balancing, valve actuating mechanisms, determination of bearing loads, inertia and centrifugal forces and production of engine parts. Prerequisite: Auto 2, Math. 35, 44. (3W) **Lee**

**103. Automatic Transmissions.** (Technical and Shop.) Development of fluid couplings, torque convertors, automatic transmissions, electric clutches, and hydraulic valve control systems. Tests and trouble diagnosis procedures emphasized. Prerequisite: Auto 3. (3W) **Beecher**

**113. Body Mechanisms** (Technical and Shop.) Modern mechanical, electrical, and hydraulic body regulating devices, windshield wipers, body wiring, heaters, and lights. Includes radio replacement. Prerequisite: Auto 13. (3W) **Willey**

**121. Power Steering and Power Brakes.** Functional characteristics and servicing of intricate steering and brake devices used on heavy vehicles. Includes differential brake steering and hydraulic controls. Prerequisite: Auto 21 (3W) **Hurst**

**122. Fuel Injection Systems.** (Technical and Shop) Design, operation, and servicing of diesel and gasoline injection systems. Includes air and solid types injection. Turbulence requirements of induction are considered. Prerequisite: Auto 22, Physics 19. (3W) **Hurst**

**123. Hydraulic Drives and Special Differentials:** A study of history and development of hydraulic clutches and transmissions used on trucks and buses. Consideration is given to unique gear designs, strength tests of materials, torque arms, radius rods, angular drives, and the evolution of differential gear design. (3S) **Hurst**

**151. Carburetion.** Technical training in fuels and combustion processes related to internal combustion engines. Emphasis is given to cycle analysis and associated carburetor problems affecting combustion. Prerequisite: Auto 52 or equivalent. Two lectures, one 3-hr. lab. (3F) **Slaugh**

**152. Motors, Generators, and Magnetos.** Technical training in construction and operation of electrical testing equipment used with the major electrical units of the automobile. Emphasis is given in industrial testing procedures and practices. Principles and practices in construction, operation, and repair of magnetos. Prerequisite: Auto 53 or equivalent. Two lectures, one 3-hr. lab. (3W) **Beecher**

**154. Seminar and Special Problems.** A systematic review of the automotive field with discussions and reports on recent developments. Lab. analysis of special problems encountered in automotive work. Prerequisites: Auto 151 and 152. Two lectures, two 2-hr. labs. (3S) **Slaugh**

**162. Metal Refinishing.** Principles and practice in preparing metal for refinishing. Fundamental procedures in priming, surfacing, and applying lacquer, enamel, and other special finishes. Two lectures, two 2-hr. labs. (3F, 3W) **Willey**

## Industrial Education

**William E. Mortimer**, Professor and Head of Department; **C. D. McBride**, **Charles W. Hailes**, **Vern R. Beecher**, Assistant Professors; **Bert V. Allen**, Instructor.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. It also offers training for management positions in industry. Students who complete their undergraduate courses receive a Bachelor of Science degree in Industrial Education with a major in Industrial Arts Education, Trade and Industrial Education, or Industrial Management.

The Master of Science degree in Industrial Education is offered 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: L.E. 102, 104, 107, 110, 111, 120, 121, 123, 124, 145, 154, 167. Courses in the 200 series are intended strictly for graduate work. Registration in these courses requires approval of the major professor and the instructor concerned.

## INDUSTRIAL ARTS

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Class A. Industrial Arts certificate, and is composed of courses in Arts and Science, Education, Industrial Arts Technical and Professional, and basic shop skills. The catalog description of each course in the curriculum is printed in the description of courses for each department offering the various courses.

## CURRICULUM

Degree: Bachelor of Science in Industrial Education

Major: Industrial Arts Education

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
English 17, 18, 19 .....	3	3	3	Econ. 51 .....	5	.....	.....
Math. 34,* 35, 44 .....	3	5	3	Physics 31, 32, 33 .....	3	3	3
E.D. 61, 62 .....	3	3	.....	Bot. 1, Physiology 4 .....	5	5	5
W.W. 61, 62 .....	5	5	.....	T.E. 57 .....	5	.....	.....
Art 1 .....	.....	.....	3	T.E. 53 .....	5	.....	.....
Soc. 70 .....	.....	.....	5	I.E. 40 .....	2	.....	.....
M.S., A.S., or P.E. ....	1	1	1	Speech 5, Art 2 .....	3	3	3
				E.E. 21 .....	.....	4	.....
				M.S., A.S., or P.E. ....	1	1	1
	15	17	15		16	17	16

\*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 Fall Quarter.

Junior				Senior			
Course	F	W	S	Course	F	W	S
Psy. 102 .....	5	---	---	I.E. 107, 112 .....	3	8	---
Public Health 155 .....	---	---	3	I.E. 129, 121, 123 .....	3	3	6
I.E. 141 .....	---	---	3	I.E. 145, 102 .....	3	---	3
I.E. 142, 143 .....	3	2	---	I.E. 110 .....	---	3	---
I.E. 144, Art 114 .....	2	---	3	E.D. 120 .....	3	---	---
Educ. 113 .....	---	3	---	Approved Electives and/or			
Educ. 114, A.E. 184 .....	---	3	2	M.S. ....	4	3	7
W.W. 170, Wel. 96 .....	2	3	---				
Approved Electives and/or					16	17	16
M.S. ....	3	8	3				
	16	16	16				

### TRADE AND INDUSTRIAL EDUCATION

Designed primarily for instructors and supervisors in Vocational Technical Education and/or Vocational Industrial programs. A candidate for the degree of Bachelor of Science in Industrial Education must show evidence of successful trade and teaching experience, together with the general education requirements necessary for state certification in his field. Observation and directed teaching in the major and minor subjects may be substituted for teaching experience. The trade and teaching experience must be approved by a committee consisting of the department heads concerned.

### CURRICULUM

Degree: Bachelor of Science in Industrial Education  
Major: Trade and Industrial Education

	Credits
A. Trade Training .....	30-60
Individuals who have trade experience or other qualifying training may secure a maximum of 18 credits by special examination.	
B. English Composition	
English 17, 18, 19, or English 10 and 110 .....	9
C. General Group requirements	
Biological Science	
Botany 1 or Zoology 1 .....	5
Physiology 4 .....	5 10
Exact Science	
Math 34 .....	3
Physics 3 and Chemistry 1, or Physics 31, 32, 33 .....	9 12
Language and Arts	
Speech 1 .....	5
Choice of Art 1, Art 3, Music 1, L.A. 3, or any lower division literature course .....	3 8
Social Science	
Economics 51 .....	5
Psychology 53 .....	5 10
Total Required	40
D. Courses for Major	
Industrial Education 102, 107, 109, 110, 112, 118, 120, 121....	29
Education 113 .....	3
Psychology 102 .....	5
English 111 .....	4
Economics 125 .....	3
Woodwork 6 .....	3
Total Required	47



E. Advanced Trade and Technical Education	26
Consists usually of upper division trade and technical courses, drafting, or other work closely related to the selected trade.	
F. Recommended Electives, including Sociology 70	36
G. Military Science & Tactics or Physical Education	6
Total Required for A, B, C, D, E, F, G .....	192

If a high school teaching certificate is desired, Education 114 and Public Health 155 must be included among the electives.

## INDUSTRIAL MANAGEMENT

The degree program in Industrial Management provides training in executive development for students whose basic training is in Engineering, Technology, or Industrial Education. A core curriculum is offered through the combined facilities of the Schools of Commerce, Education and Engineering and Technology. In addition the student takes the courses listed below for the degree in Industrial Management. This program is designed to meet the needs of people who desire to prepare for supervisory and executive positions in industry. Work experience is made possible through a cooperative arrangement with industry.

## CURRICULUM

Degree: Bachelor of Science in Industrial Education  
Major: Industrial Management

Core Curriculum: See Industrial Management in the Business Administration Section, School of Commerce, page 148.

### Industrial Management Emphasis

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
English 17, 18, 19 .....	3	3	3	Indus. Educa. 21 .....	...	...	3
Electives .....	2	4	2	T.E. 58 .....	...	2	...
Work Experience, 10 Weeks				Art 1 .....	3	...	...
				Electives .....	1	...	2
				Work Experience, 10 Weeks			
Junior				Senior			
Course	F	W	S	Course	F	W	S
Indus. Educa. 120, 104 .....	...	3	3	Ind. Edu. 264 .....	...	3	...
Psych. 181, 127 .....	5	...	3	Ind. Edu. 121 .....	...	3	...
Electives .....	1	4	4	Ind. Edu. 117 .....	...	3	...
Work Experience, 10 Weeks				Econ. 150 .....	...	...	3
				Econ. 180 .....	...	...	2
				Electives.. .....	5	4	5

## Courses

**13. Driver Training.** For persons who desire to learn to drive an automobile correctly and safely. Traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; general mechanics, operation, and servicing of automobile; highway safety engineering; and actual supervised training in dual-control cars. Two lectures, lab. arranged. (2F, W, S) **Beecher**

**21. Industrial and Labor Relations.** The nature and problems of the employee class today; and nature and problems of industry and management in America; the principles, objectives and processes of collective bargaining; government policies; and the economics of income and security. An orientation course for students preparing for industry and business. Three lectures. (3F, S) **McBride**



**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, seaming, riveting, and wiring. Two 3-hour labs. (2F) **Hailes**

**102. Instructional aids.** Instruction in the purpose, types, sources, preparation, and proper use of audio and visual aids, including samples, models, charts, graphs, slides, still film, movie film, sound film, and other aids suitable for classroom and auditorium use. Prerequisites: I.E. 107 and 129. Three lectures. (3W) **Mortimer**

**104, 204. Occupational Analysis.** Principles and practice in analyzing occupations in order to determine teaching content. Students complete an analysis of one unit for a trade or occupation. Three lectures. (3 Arr.) **Staff**

**107. Principles and Objectives of Industrial Education.** Philosophy and purposes of Industrial Education. Students study and compare general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three lectures. (3F) **Mortimer**

**110. Shop Organization and Management.** Teaches students to organize and manage an Industrial Education shop of the unit, general, or multiple activity type. Each student prepares, for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. Prerequisites: I.E. 107, 129. Three lectures. (3W) **Hailes**

**111. The General Shop.** Comprehensive study of the types of "General Shop," its advantages and applications; content and organization of subject matter; methods of teaching and shop plans. General shop projects, shop plans and new trends in content and equipment are given special consideration. Prerequisite: I.E. 107. Three lectures. (3 Arr.) **Hailes**

**112. Observation and Directed Teaching.** Students observe and teach in Industrial Arts shops throughout the state. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the state in junior and senior high schools. (8W) **Mortimer; Hailes**

**113. Driver Education and Traffic Safety.** To acquaint prospective teachers and others with available instructional materials for driver education and the latest methods of presenting these materials in the classroom and on the road. Supervised practice is arranged for each student. (3F, W or S) **Beecher**

**117. Foremanship and Supervision.** A comprehensive study of the place and functions of the foreman or supervisor in industry and business. Emphasizes foremanship as an important part of management. Provides the practical information a foreman or supervisor needs in his work. Prerequisite: I.E. 120. Three lectures. (3W) **McBride**

**118. Industrial Safety Education.** A practical course for technical workers, supervisors, and foremen in fundamentals of plant planning and operation for accident prevention. Special consideration is given to planning safety programs to meet needs of particular situations as they are experienced by the members of the class. Three lectures. (3W) **McBride**

**119. Job Evaluation and Wage Incentives.** The place of job evaluation and wage incentives and their use in successful management. How to set up these techniques and put them into operation. A practical course for both students and employed personnel for direct application in all levels of management. Prerequisites: I.E. 120 and 117. Three lectures. (3S) **McBride**

**120. Personnel Relations.** Training for leadership in industry as foremen, supervisors, and directors. Problems in organizing, supervising, training, and directing personnel. Directed conferences based on student experiences and directed studies in leadership problems and principles. Three lectures. (3F or S) **McBride**

**121. Methods in Industrial Education.** Latest techniques of teaching applied to individual and group instruction in Industrial Education. Each student has opportunity to use these different methods in presenting lessons before the class. Prerequisites: I.E. 107, 129. Three lectures. (3W) **Mortimer**

**123. Curriculum Problems in Industrial Arts.** To teach prospective junior high school Industrial Arts instructors the application of skills and knowledge acquired in basic shop courses. Each student constructs projects suited to the work recommended by the State Department of Education. He prepares lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisites: I.E. 129 and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. Three lectures, five 2-hour labs. (6S) **Mortimer; Hailes**

**124. History of Industrial Education.** Historical developments of manual and industrial education from the early leaders to the present. Emphasis is given to the influence that various leaders and movements, in both Europe and America, have had upon present-day objectives of industrial arts and vocational industrial education. Three lectures. (3 Arr.) **Mortimer**

**129. Organization and Development of Industrial Materials.** Selection and arrangement of teaching materials to be used in industrial arts and trade and industrial shop work. Three lectures (3F) **Mortimer**

**141. Art Metalwork.** Laboratory work in embossing, sinking, engraving, etching, and metal spinning operations. Work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Tool Technology. Three 3-hour labs. (3S) **Hailes**

**142. Plastics.** Acquainted students with the new and important group of plastic materials now produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. Special emphasis is given to the place of plastics in modern industrial arts programs. Three 3-hour labs. (3F) **Hailes**

**143. Recreational Crafts.** Especially for students majoring in recreational leadership. Consists of: (1) planning and organizing craft work as part of community recreational programs, (2) laboratory work in crafts, such as wood, leather, plastics, metals, and others. Two 3-hour labs. (2S) **Hailes**

**144. Foundry Principles and Practices.** Principles and practices of basic foundry work. Castings will be made using common non-ferrous metals, such as aluminum, copper, brass, and bronze. Two 3-hour labs. (2F) **Hailes**

**145. Industrial Arts Applied Electricity.** Provides the prospective teacher with an understanding of how the basic principles and applications of electricity in the home and in industry should be prepared for the industrial arts program of secondary schools. Prerequisite: E.E. 21. One lecture, two 3-hour labs. (3F) **Mortimer**

**167. Special Problems in Industrial Education.** For qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Time and credit arranged. **Staff**

**207. Philosophy of Vocational Education and the Practical Arts.** Designed to enrich and expand the student's understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. Prerequisite: I.E. 107 or equivalent. Three lectures. (3 Arr.) **Staff**

**209. Course of Study Building in Industrial Education.** Teaches students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, reference, tests, and instructional schedule. Each student completes this work for one unit of instruction. Prerequisite: I.E. 107. Three lectures. (3 Arr.) **Mortimer**

**251. Administration and Supervision of Industrial Education.** The laws, regulations, and policies affecting Industrial Education programs; organization, supervision, and management necessary for successful operation of these programs. Three lectures. (3 Arr.) Staff

**254. 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 intelligent use of the tests are covered. Prerequisite: Psychology 102. Three lectures. (3 Arr.) Mortimer

**225. Techniques in Writing Instruction Sheets.** Principles underlying development of instruction sheets for use in industrial arts and trade and industrial education programs. Prerequisite: I.E. 129. Three lectures. (3 Arr.) Staff

**259. Planning and Equipping School Shops.** Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. For administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students study basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to solution of their particular problems. Prerequisite: I.E. 110. Two lectures. (Arr.) Staff

**261. Part-time Education.** Content, methods, and special devices to be used in part-time education programs. Emphasis upon pertinent problems and their solutions. Workshop or lecture. (3 Arr.) Staff

**263. Evening School Programs.** Development, organization, and improvement of evening school programs in Industrial Education. Workshop or lecture. (3 Arr.) Staff

**264. Conference Leading.** Principles and practice in conference leading applied to methods used in industry. Emphasis given to preparation, use and evaluation of this method as it affects industrial education programs. Workshop or lecture. (3 Arr.) Staff

**265. Apprenticeship.** Development, organization, and improvement of apprenticeship training programs for industry. Workshop or lecture. (3 Arr.) Staff

**266. Related Instruction.** Content, methods, and special devices used in teaching related subjects in vocational programs. Emphasis on pertinent problems and their solutions. Workshop or lecture. (3 Arr.) Staff

**267. Reading and Conference.** Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of the department head; investigation is carried on under direction of the major professor. (Arr.) Mortimer

**270. Seminar in Industrial Education.** Gives opportunity for investigation and reporting of individual problems. (1-2 Arr.) Mortimer

**271. Research and Thesis Writing.** Provides for individual work in thesis writing in industrial education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arr.) Mortimer

**290, 291, 292. Advanced Studies under Plan "B."** Special library and seminar problems or studies designed to meet requirements for reports under plan "B." (2-3 Arr.) Mortimer

## Photography

Bert V. Allen, Instructor.

General service courses are available for college students desiring instruction in fundamentals of photography. Some courses are designed especially for students registered in Agriculture, Journalism, Engineering and Technology, Forestry, and other specialized subjects where photography supplements their major.

### Description of Courses

**51. General Photography.** Principles and practices in fundamentals of general photography. Training in selection and use of cameras, lenses, meters, films, filters, lights, developers, and accessories. Two lectures, one 3-hr. lab. (3F, W or S) Allen

**61. General Photography Laboratory.** Additional lab work to supplement Photography 51 for those desiring more than 3 credits of work. Two 3-hr. labs. (2F, W or S) Allen

**151. Photographic Problems.** Designed to help students solve advanced photographic problems. May be repeated provided that a different type of photographic work is taken each time the student registers. Repeating students must have approval of major professor and department head. Prerequisite: Photography 51. Two lectures, two 2-hr. labs. (3F, W or S) Allen

**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, Photo. 51. Three lectures, two labs. (5F) Allen

### Welding

A. B. Kemp, Head of Department and Instructor; Ross W. Eskelson, Instructor.

Modern manufacturing methods of today require the services of the welding engineer, technician, and skilled craftsman.

The Welding Department is so set up as to give progressive instruction in welding to supply the demands of industry with four-year curricula leading to degrees in Welding Engineering and in Industrial Technology, and a two-year curriculum leading to a Certificate of Completion.

Trained men in all three fields are in great demand by all manufacturers of metal products. Service courses are offered to all on the campus who wish to explore this field of science.

### WELDING ENGINEERING CURRICULUM

Degree: Bachelor of Science in Welding Engineering

Freshman					Junior				
Course	F	W	S		Course	F	W	S	
C.E. 12, 65	1	1	1	1	Math. 97, 98, 99	5	5	5	
Math. 34, 35, 46	3	5	5		Physis 20, 21, 22	5	5	5	
Engl. 17, 18, 19	3	3	3		Weld. 91, 92, 94	3	3	3	
Chem. 10, 11	5	5			C.E. 84	4			
Weld. 96			3		Econ. 51			5	
E.D. 61, 62, 63	3	3	3		Speech 5		3		
M.S. or A.S.	1	1	1		M.S. or A.S.	1	1	1	
	16	18	16			18	17	19	
Sophomore					Senior				
Course	F	W	S		Course	F	W	S	
Weld. 153, 154, 155	3	3	3		Weld. 161, 162, 163	3	3	3	
C.E. 196, 141, 144	4	4	3		C.E. 105, 190, 192	6	3	3	
C.E. 101, 102, 103	4	4	4		C.E. 111, 112, 130	4	3	3	
T.E. 150	3				Weld. 193			2	
E.E. 107, 108		4	4		C.E. 109, 110		1	1	
Electives or M.S.	3	3	3		I.E. 118			3	
	17	18	17		Engl. 111 or 112		4		
					Electives or M.S.	3	3	3	
						16	17	18	

**WELDING TECHNOLOGY CURRICULUM**

Degree: Bachelor of Science in Industrial Technology  
Major: Welding Technology

Sophomore				Freshman			
Course	F	W	S	Course	F	W	S
Weld. 41, 42, 43 .....	5	5	5	Weld. 44, 45, 46 .....	5	5	5
Engl. 17, 18, 19 .....	3	3	3	Econ. 50 .....	3	---	---
E.D. 61, 62 .....	3	3	---	Physics 17, 18, 19 .....	5	5	5
Math. 34, 35, 44 .....	3	5	3	Speech 5 .....	---	3	---
Psy. 80 .....	---	---	3	Sociology 70 .....	---	---	5
A.E. 82 .....	2	---	---	S.S. 65, 30, 86 .....	3	3	1
T.E. 51 .....	---	---	3	M.S. or A.S. ....	1	1	1
M.S. or A.S. ....	1	1	1				
	17	17	18		17	17	17
Junior				Senior			
Course	F	W	S	Course	F	W	S
Weld. 153, 154, 155 .....	3	3	3	Weld. 161, 162, 163 .....	3	3	3
T.E. 52, 53, 58 .....	5	4	2	Weld. 193 .....	---	---	2
Chem. 10, 11 .....	5	5	---	C.E. 130, 190, 192 .....	3	3	3
Zool. 1 .....	---	---	5	B.A. 109, 147, 148 .....	3	3	3
Zool. 111 .....	---	---	4	I.E. 117, 118, 119 .....	3	3	3
I.E. 120 .....	---	3	---	Econ. 125, 126 .....	3	3	---
Electives or M.S. ....	3	3	3	Electives or M.S. ....	3	3	3
	16	18	17		18	18	17

**Two-Year Vocational Technical Program****Certificate of Completion of Welding**

First Year				Second Year			
Course	F	W	S	Course	F	W	S
Weld. 41, 42, 43 .....	5	5	5	Weld. 44, 45, 46 .....	5	5	5
English 17, 18, 19 .....	3	3	3	Physics 31, 32, 33 .....	3	3	3
W.W. 6 or Math. 34 .....	3	---	---	I.E. 21 .....	---	---	3
E.D. 61, 62 .....	3	3	---	T.E. 51 .....	5	---	---
A.E. 83 .....	---	---	3	I.E. 40 .....	---	---	2
M.S. or A.S. 1, 2, 3 .....	1	1	1	Auto. 52 .....	---	3	---
Electives .....	2	5	5	M.S. or A.S. ....	1	1	1
	17	17	17	Electives .....	3	5	3
					17	17	17

**Courses**

In all of the following courses, various techniques and welding positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

**41, 42, 43. Acetylene Welding.** Acetylene welding of ferrous and non-ferrous metals as used by industry. (5F, 5W, 5S) Eskelson

**44, 45, 46. Electric Welding.** Electric welding as used in industry, (5F, 5W, 5S) Kemp

**91. Acetylene Welding.** Principles and practice in fundamentals of oxy-acetylene welding and cutting. A general service course open to all college students. Two lectures, two 2-hr. labs. (3F, 3W, 3S) Eskelson

**92, 93. Aero Welding.** Principles and practices in fundamentals of aircraft welding. Prepares for C.A.A. tests. (3W, 3S) Eskelson



**94. Electric Welding.** Principles and practice in use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc-welding of steels. Two lectures, two 2-hr. labs. (3F, 3W, or 3S) **Kemp**

**96. Engineers' Welding.** Exploration in modern welding. Students receive basic instruction and practice in use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. (3S) **Kemp; Eskelson**

**153, 154, 155. Advanced Acetylene Welding.** Hard surfacing, special bronzing problems, pipe welding, and other problems. Qualifies for code, tests. Prerequisite: Weld. 43 or 92. (3F, 3W, 3S) **Eskelson**

**161, 162, 163. Advanced Electric Welding.** Special problems in arc-welding and qualifies students for code test. Prerequisite: Weld. 46. (3F, 3W, 3S) **Kemp**

**190. Advanced Acetylene Welding.** Vertical and overhead steel welding. Special problems. Prerequisite: Weld. 91. (3F, 3W, 3S) **Eskelson**

**191. Advanced Electric Welding.** Vertical and overhead arc-welding. Special problems. Prerequisite: Weld. 994. (3F, 3W, 3S) **Kemp**

**193. Welding Seminar.** Current topics in production methods, cost, design, and manufacture of welded products used in modern industry. (2S) **Kemp**

## Woodwork and Building Construction

**Joseph Coulam**, Professor and Head of Department; **Charles N. Merkley**, Associate Professor; **Dan H. Swenson**, Assistant Professor; **Ross A. Nyman**, **Lynn A. Thompson**, Instructor.

**D. A. Swenson**, Professor Emeritus.

This department offers courses 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. It provides 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

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
English 17, 18, 19 .....	3	3	3	Chem. 10, 11 .....	5	5	---
E.D. 61, 62, 93 .....	3	3	3	E.D. 94, 63 .....	---	3	3
Math. 34, 35, 44 .....	3	5	3	Econ. 51 .....	---	---	5
W.W. 61, 62, 63 .....	5	5	5	W.W. 64, 65, 66 .....	5	5	5
W.W. 170 .....	---	---	2	W.W. 72, 68, 60 .....	2	3	3
M.S. or A.S. ....	1	1	1	M.S. or A.S. ....	1	1	1
	15	17	17	E.E. 21 .....	4	---	---
Junior				Senior			
Course	F	W	S	Course	F	W	S
B.A. 109, 147, 148 .....	3	3	3	W.W. 171 .....	5	5	5
C.E. 84, W.W. 73 .....	4	3	---	Forestry 130 .....	---	---	4
W.W. 161, 162, 163 .....	5	5	5	Econ. 125 .....	3	---	---
Phys. 17, 18, 19 .....	5	5	5	C.E. 190, History 135 .....	---	3	5
Electives .....	---	2	5	English 111 or 112 .....	4	---	---
	17	18	18	Zoology 111 .....	---	4	---
				Art 126 .....	3	---	---
				Electives .....	---	8	6
					15	15	15



**Two-Year Vocational Technical Program  
Certificate of Completion in Carpentry**

First Year				Second Year			
Course	F	W	S	Course	F	W	S
English 17, 18, 19 .....	3	3	3	W.W. 64, 65, 66 .....	5	5	5
W.W. 61, 62, 63 .....	5	5	5	W.W. 171, 172, 173 .....	5	5	5
W.W. 72, 73 .....	2	3	---	W.W. 170, 68 .....	2	3	---
W.W. 6, 60 .....	3	---	2	E.E. 21 .....	4	---	---
E.D. 61, 62, 93 .....	3	3	3	E.D. 94 .....	---	3	---
Weld. 96 .....	---	---	3	Ind. Ed. 21 .....	---	---	3
A.C. & R. 61 .....	---	3	---	M.S. or A.S. ....	1	1	1
M.S. 1, 2, 3 .....	1	1	1	Electives .....	---	---	3
	<hr/> 17 18 17				<hr/> 17 17 17		

**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 three-hour 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.** Simple mathematical formulas are used in solving problems in mechanical work. These include speed ratios, steel square, micrometer reading, and area and volume problems. Prerequisite: High school algebra and geometry. Three lectures. (3F or W) Coulam; Nyman

**60. Elements of Plumbing.** Includes specifications, codes, layouts, installations, inspections, cutting and fitting pipe, and repairs. One lecture, one lab. (2S) Merkley

**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 study of 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 woodwork problems. Projects in bench work and wood turning to give practice in fundamentals of wood construction. Five labs. (2, 3 or 5F; 2, 3 or 5W; 2, 3 or 5S) Swenson; Nyman

**64, 65, 66. Building Construction.** Laying out and constructing buildings, stressing carpenter work. Includes concrete forming, framing, roof framing, roofing, scaffolding, siding, exterior and interior trim, window and door work. Special attention is given to trade construction methods. Prerequisite: W.W. 63. (5F, W or S) Merkley

**68. House Wiring.** For students in building construction courses. Covers the national electrical code and local codes in Utah communities. Includes choice of materials, design of circuits and inspection for electrical heat, light, and power installation in homes and small public buildings. Two lectures, one lab. (3W) Thomson

**72. Concrete and Clay Products.** Composition of concrete for various purposes. Composition of bricks and tile; their strength and thermal conductivity. Projects are built in the laboratory during the course. One lecture, one lab. (2F) Merkley

**73. Materials of Industry.** Wood and wood products, commercial veneered panels, roof coverings, wall boards, insulating materials, siding, composition panelings, glass products and other non-metal materials used in building trades. Three lectures. (3W) Merkley; Mortimer

**74. 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,

calcimining and wallpaper cleaning receive attention. Minor repairs to heating, ventilating and refrigeration equipment are also considered. Open to men and women students. Prerequisite: High school physics or equivalent. Five labs. (2-5 F, W or S) Staff

**160. Pattern Making.** Simple patterns illustrating construction and choice of materials and principles of shrinkage. Prerequisite: W.W. 61. Five labs. (5S, 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, specification writing, cost estimating, construction methods, allowable loads, and drawing of special sections and details. Problems in actual bidding on sets of plans are worked out by students. Prerequisites: W.W. 66, E.D. 94. Three lectures, two labs. (5F, W or S)\*

**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, and stucco paints. Students are required to practice in each type of finishing. One lecture, one lab. (2F, W or S) Mortimer; Nyman

**171, 172, 173. Cabinet Work.** Design and construction of furniture and cabinets, including a study of woods suitable for furniture and cabinet making, wood turning, inlaying, and types of wood finishing. Projects are built which include inlaying and overlaying. Prerequisite: W.W. 63. All lab. (5F, W S) Nyman; Coulam

**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) Nyman; Swenson

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\*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 comparative newness of the fields of forest management, range management, wildlife management, soil conservation, watershed management, and forest recreation, and the unquestioned need for their correlation in long range wild land management, have created excellent opportunities for men who wish to enter these fields of public service. The purpose of this school is to provide training in the conservation and management of wild lands and their resources so that they may be of continuing benefit for present and future generations of citizens.

The favorable geographical location of this School of Forest, Range and Wildlife Management provides exceptional facilities for field experience and affords excellent opportunities for effective training in managing wild lands and their resources. Forests and range lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of the school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range, soil conservation, and wildlife problems and offer unlimited study projects and opportunities for demonstration. Herds of elk and deer are studied close to the campus during the winter. Primitive areas, Yellowstone Park and other national parks are within a half day to one day's driving distance.

A regional office of the U. S. Forest Service is in Ogden, 45 miles distant, and offices of the U. S. Bureau of Land Management, U. S. Bureau of Reclamation, U. S. Indian Service, and U. S. Soil Conservation Service are in Salt Lake, 85 miles from Logan.

## RECOMMENDED ENTRANCE QUALIFICATIONS

Normally, graduation from high school is prerequisite to entrance in the school. Veterans and certain others, not high school graduates, may be admitted if they make acceptable scores on the General Education Development (G.E.D.) Tests.

Students entering the School of Forestry, Range, and Wildlife Management will make more satisfactory progress if they have had high school algebra, chemistry, physics, typing, botany, zoology, and geometry. Students who have not had high school algebra or geometry should make up these deficiencies by taking their equivalent within the college as soon as possible.

## COURSES OF STUDY

The curricula of this school prepare men for positions with federal or state agencies and for private work in (1) forest management, (2) range management, and (3) wildlife management. Forest management students may choose between two options: one designed to train for general forestry work, as with the public land managing agencies, and one more strictly for timber management. Range management students may choose, in the junior year, to take in soil conservation and watershed management, or the regular, basic range management course. Wildlife management students may select a curriculum to train for management of big game; a curriculum in general wildlife management with emphasis on small game and fur-bearers; or, a curriculum in fishery management.

## SUMMER CAMP

The School has purchased and leased approximately 3,000 acres of forest and range land 22 miles from the campus within the Cache National Forest, where training facilities have been established. Field instruction is required for graduation in addition to the regular 12 quarters of classroom work. Also, at least one summer season of practical experience in his field of specialization is expected of all students.

Attendance at summer camp is required between the sophomore and junior

years. The camp opens soon after the close of the spring quarter and continues for 8 weeks. Nine credits are allowed for the complete program. In addition to the regular summer school fees, a \$5.00 fee is charged for each of the four courses. Board is provided on a cost basis, lodging is without cost. Students attending camp must be inoculated against Rocky Mountain spotted fever.

Students in other colleges or universities who wish to transfer to this school should consider carefully the following: Successful completion of all courses offered in the summer camp is (a) required for graduation in all three departments in the school, and (b) prerequisite to most of the professional courses in the junior and senior years. In planning a course of study for the junior and senior years, transfer students should note in the description of courses those for which the summer camp training is prerequisite. It should be recognized that some transfer students coming to this school with two or more years of college work may be required to take more than two years to graduate. Transfer students should also note that to be eligible to attend summer camp they should have completed approximately two years college work, essentially duplicating the courses required of freshmen and sophomores in this school. It is especially important that they have had such courses as systematic botany and a field course in engineering surveying.

### FIELD TRIPS

Field trips are planned each year as part of the regular class instruction. Besides short trips scheduled for individual courses, each department conducts an extensive field-problems trip in the spring quarter of the junior year; this trip is required of all students. The trip for students majoring in wildlife usually is scheduled over the first week of May, and for range management juniors over the second or third week of May. The trip for forest management juniors is taken during a period of ten days or two weeks just prior to the end of the spring quarter. A fee of about \$35.00 is charged each student to defray the general expenses of the trip.

### LOAN FUNDS

Two sources of funds are available on a loan basis to worthy, deserving students in the School of Forest, Range, and Wildlife Management. These are the W. B. Rice Memorial Loan Fund, and the Bureau of Land Management Fund. Loans are made for short periods, that is, a few months or to juniors and seniors for a period of a year or two. The funds are administered by a faculty committee and application should be made to the Dean's office.

### GENERAL REQUIREMENTS FOR GRADUATION

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management:

- A. Two hundred and one credits (quarter hours) exclusive of basic Military Science and/or Physical Education.
- B. Successful completion of summer camp, for which 9 credits are earned.
- C. All courses prescribed under the study program of the chosen field.
- D. All of the following general requirements:
  1. English and Speech, 16 credits, of which at least 3 must be Speech.
  2. Social Science, 8 credits, of which 5 are General Economics.
  3. Military Science or Physical Education—6 quarters.
- E. All students must demonstrate reasonable proficiency in written and spoken English; students showing marked deficiency are required to pass successfully certain supplementary or corrective courses in addition to the requirement stated above.

## BASIC COURSES

Required of all students in the School of Forest, Range, and Wildlife Management.

Freshman				Sophomore			
Courses	F	W	S	Courses	F	W	S
<sup>1</sup> Military Science 1, 2, 3 ....	1	1	1	<sup>1</sup> Military Science 4, 5, 6 ....	1	1	1
English 17, 18, 19 .....	3	3	3	Botany 24, 25, 30 .....	5	5	5
Chemistry 10, 11, 12 .....	5	5	5	Civil Engineering 81, 80 ....	3	3	---
<sup>2</sup> Mathematics 34, 35, 44 ....	3	5	3	Physics 6 .....	5	---	---
Speech 5 .....	---	3	---	Agronomy 58 .....	---	---	5
Forestry 1 .....	3	---	---	Economics 51 .....	---	5	---
<sup>3</sup> Animal Husbandry 1 .....	---	---	3	<sup>5</sup> Geology 3 .....	5	---	---
<sup>4</sup> Animal Husbandry 2 .....	---	---	2	<sup>6</sup> Botany 120 .....	---	---	5
Civil Engineering 60 .....	---	1	---	<sup>7</sup> Zoology 3, 4, 13 .....	5	5	5
Forestry 1 .....	---	3	---	<sup>8</sup> Animal Husbandry 10 .....	---	---	5
Forestry 2, 3 .....	---	½	½	Forestry 45 .....	---	½	½

## SUMMER CAMP

Required courses at summer camps: Credits

Forestry 96, Forest Surveying .....	3
Forestry 97, Forest Practice .....	2
Range Management 98, Range Practice .....	2
Wildlife Management 99, Wildlife Practice .....	2

It should be noted that junior standing, that is, the equivalent of 90 quarter hours or 60 semester hours of college work is prerequisite to all courses offered by the School of Forest, Range, and Wildlife Management except Forestry 1, 2, 3, 4, 5, 10, 11, 26, 96, and 97, and Range 98, and Wildlife 99.

## FOREST MANAGEMENT

J. Whitney Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; R. R. Moore, Associate Professor and Director of Summer Camp; Stewart Ross Tocher, Assistant Professor; Grant A. Harris, Extension Forester; James L. Mielke, Collaborator in Forest Pathology.

Upon completion of either of the curricula prescribed below, students are granted the degree of Bachelor of Science in Forest Management. The courses are designed to give the student comprehensive training in all branches of forest management, including growing, protecting, harvesting and utilizing of timber crops. Two options are offered by this department. It is desirable that the student know by the end of his sophomore year which he will follow. The option in general forestry provides training in timber management, and in addition training is provided in range management, wildlife management, recreation, and watershed management. This type of curriculum is particularly well adapted to the needs of personnel of the public land managing agencies such as the U. S. Forest Service, Bureau of Land Management, Park Service, Soil Conservation Service, and comparable state agencies. The second option, timber management, provides major emphasis on the growing, harvesting, and utilizing of timber crops and is more appropriate training for employment in private forestry or much more specialized timber work with the public agencies.

1—Not required of men who have served with the U. S. Armed forces.

2—Students presenting 1½ units of high school algebra or otherwise qualified to take Math. 35 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 of the sophomore year of forestry majors only.

7—Required of wildlife majors only.

8—Required of range majors, excepting soil conservation students. Wildlife management majors may substitute Animal Husbandry 10, or Physiology 4.



It is highly desirable that every student engage in field work related to forestry in the summer following the freshman and junior years. Students are urged to obtain employment with such agencies as the U. S. Forest Service, Park Service, or comparable state agencies, or in private forest industries. There is maintained a working agreement with the Forest Service which provides supervised and planned training jobs in the summer, at regular wages, and gaining for the student three hours credit. The school maintains an employment service to aid students in obtaining such summer work.

**Electives:** Electives necessary to complete the program of the first two years should be chosen with the object of improving the student's cultural as well as professional background. In the junior and senior years, electives should be chosen with the object of broadening a specific field of study. Courses selected must meet the approval of the student's advisor.

The degrees of Master of Science in Forest Management or Master of Forestry are given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. The Master of Science degree requires that the candidate obtain a Bachelor's degree in Forest Management and in addition one or two years residence study depending upon his ability and his thesis problem. The Master of Forestry degree is designed for those who have a Bachelor's degree in some other field and who wish to earn a degree in Forestry. It normally requires from two to three years, depending upon how close the candidate's original field was related to Forestry. 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

##### Junior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Measurements I, II .....	For. Mgmt.		106	107		4	4
Dendrology I, II .....	For. Mgmt.	112	113		3	2	
Silviculture I, II .....	For. Mgmt.		114	115		3	3
Forest Protection I, *II .....	For. Mgmt.	118	119		3	3	
Public Land Administration .....	For. Mgmt.		132			3	
Junior Field Problems .....	For. Mgmt.			146			3
Plant Ecology .....	Range Mgmt.	126			5		
Range Management .....	Range Mgmt.	162			5		
General Wildlife Management ....	Wildlife Mgmt.			150			5

##### Senior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Management .....	For. Mgmt.	121			4		
Forest Valuation .....	For. Mgmt.		122			3	
Forest Economics .....	For. Mgmt.			123			3
Wood Technology .....	For. Mgmt.	126			3		
Forest History and Policy .....	For. Mgmt.		133			2	
Improvements and Recreation ....	For. Mgmt.			137			3
Silviculture III .....	For. Mgmt.		120			3	
*Range Forage .....	Range Mgmt.		176			4	
*Watershed Management .....	Range Mgmt.	180			4		
Junior English .....	English			112			4
Aerial Photo Interpretation .....	For. Mgmt.			134			3

### B. Timber Management

Students who choose the timber management option will substitute the following courses for those marked (\*) above:

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Seeding and Planting .....	For. Mgmt.			116			2
Logging .....	For. Mgmt.	125			3		
Mechanical Properties .....	For. Mgmt.		129			2	
Milling and Products .....	For. Mgmt.			130			4
Forest Entomology .....	Zoology	105			3		
Forest Pathology .....	Botany		140			4	

1—English 111 may be substituted for English 112.

### Description of Courses

**1. General Forestry.** Survey of professions of forest management, range management, soil conservation, recreation and wildlife management; character of the work; and relation of conservation and multiple uses of wild land to welfare of state and nation. Open to all students. (3F, 3S) **Turner**

**2, 3. Natural Resources Management.** Required of all first and second year students in School of Forest, Range, and Wildlife Management. ( $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Staff**

**4, 5. Natural Resources Management.** Required of all second year students in the School of Forest, Range and Wildlife Management. ( $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Staff**

**10. Forest and Range Conservation.** Introduction to conservation problems designed to acquaint students with the nature and extent of the organic resources of the United States and methods of conserving them. Open to all students except those majoring in the School of Forest, Range, and Wildlife Management. (2F) **Turner**

**11. Winter Woodcraft.** Lectures, field trips designed to train student in proper way of living in wilderness. He must furnish his own field equipment and have suitable outdoor clothing. Lecture, field trips. (3W) **Kelker**

**26. Wood Technology and Mechanical Properties of Wood.** For vocational education majors or industrial arts majors. Covers structure, identification, mechanical properties of commercial woods of United States. (3F) **Tocher**

**96. Forest Surveying.** Practical field problems in surveying methods commonly employed in forest, range and wildlife management. Practice in various forest and range land developments. Type mapping. Lab. fee \$5.00. Summer Camp (3) **Staff**

**97. Forest Practice.** Field studies in inventories, successional stages and growth of stands of trees. Study of forest soils and related land use. Lab. fee \$5.00. Summer Camp (2) **Staff**

**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 majoring in the Forest Management Department. Prerequisite: Summer Camp (3F) **Daniel**

**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 majors in the Forest Management Department. Prerequisite: Summer Camp (3W) **Tocher**

**106. Forest Measurements I.** Measurements of timber in log, tree, and stand. Log rules and volume tables. Timber cruising practices. Prerequisite: Summer Camp. (4W) **Moore**

**107. Forest Measurements II.** Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all aged, and residual cut over stands. Prerequisite: For. 106. (3S) **Moore**

**112. Dendrology I. Hardwoods.** Identification, distribution, and silvics of the more important forest trees in the United States. Prerequisite: Summer Camp. (3F) **Daniel**

**113. Dendrology II. Conifers.** Identification, distribution and silvics of the more important forest trees in the United States. Prerequisite: Summer Camp. (2W) **Daniel**

**114. Silviculture I.** Characteristics of the tree species which influence silvicultural practice in the United States. Prerequisites: Summer Camp, Range 126, For. 112, and Botany 120. (3W) **Daniel**

**115. Silviculture II.** Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: For. 114. (3S) **Daniel**

**116. Seeding and Planting.** Seed collection, extraction, and cleaning methods; germination testing; storage of forest tree seeds. Practical experience in field planting and nursery work. Prerequisite: For. 115. (2S) **Daniel**

**118. Forest Protection I.** Prevention, presuppression and suppression of forest and range fires, including economic and physical effects. Fire behavior. Field trips. Prerequisite: Summer Camp. (3F) **Floyd**

**119. Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. (3W) **Floyd**

**120. Silviculture III.** Regional silviculture of United States. (3W) **Daniel**

**121. Forest Management.** Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. The first week of the quarter will be spent in the school forest collecting basic management data. It is important and necessary that all students enrolled in the course attend all of this camp. Prerequisites: Summer Camp, For. 106, 107, 115. (4F) **Moore**

**122. Forest Valuation.** Determination of monetary values in forest growing stock and land. Analysis of alternative management methods by use of standard valuation techniques. Prerequisites: For. 121. (3W) **Moore**

**123. Forest Economics.** Economic problems involved in the utilization of forest land and timber, and in the distribution of forest products. Prerequisites: For. 122. (3S) **Moore**

**125. Logging.** Principles and methods of harvesting wood products. Emphasis on cost, values and the application of forestry to the harvesting process. (3F) **Moore**

**126. Wood Technology.** Structure and identification of the economic woods of United States. (3F) **Tocher**

**1299. Mechanical Properties.** Factors affecting the strength of wood. (2W) **Tocher**

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

**132. Public Land Administration.** History, organization and functions of conservation agencies affecting range, forest, and wildlife administration. Personnel management problems. (3W) **Floyd**

**133. Forest History and Policy.** Development of federal, state, and private forest policy. (2W) **Turner**

**134. Aerial Photo Interpretation.** Elements of photogrammetry. Use of aerial photographs in mapping vegetation types and estimating timber volumes. Construction of planimetric maps from vertical photographs. (3S) **Tocher**

**137. Improvements and Recreation.** Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and planning of areas suitable for this purpose. Prerequisite: Summer Camp (3S) **Floyd**

**138. Recreational Planning.** Mapping and designing plans for the various forms of forest recreational use. (3S) **Floyd**

**145. Forest Problems.** Individual study and research upon a selected forestry problem approved by the instructor. (1-3 F, W, S) **Staff**

**146. Junior Field Problems.** Study of forest operations. (3S) Junior year. Fee, \$35.00. **Floyd**

**201, 202, 203. Advanced Forestry Seminar.** Review and discussion of advanced current literature. For students in the graduate school. (1F, 1W, 1S) **Turner**

**204. Forest Ecology.** Study of past and present distribution of forest species and forest types and the physical-biological basis of distribution and growth performance. (3W) **Turner**

**205. Silviculture.** Intensive study of a particular region by individuals. Group work consists of advanced treatment of silvics and silviculture with emphasis on physiological aspects of both subjects. (3W) **Daniel**

**206. Forest Management and Valuation.** Application of forest management principles; forest organization and development; forest regulation, valuation, and control of operations. (2F) **Moore**

**207. Forest Protection.** Advanced study in specialized fields of forest protection. (2F) **Floyd**

**208. Forest Measurements.** Application of statistical measurements to forest problems. (3F) **Moore**

**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**

## Range Management

**L. A. Stoddart**, Professor and Head of Department; **Arthur D. Smith**, **C. Wayne Cook**, Associate Professors; **Grant A. Harris** and **Max E. Robinson**, Assistant Professors.

A 4-year program leading to the degree of Bachelor of Science in range management is available in the School of Forest, Range, and Wildlife Management. Opportunity is given under this program to specialize in general range management or in range soil conservation and watershed management.

The range management option acquaints the student with methods of operating a ranch in the western range area and of managing range lands for private operators or for the federal or state governments. Graduates under the soil conservation and watershed management program are especially qualified for work with the Soil Conservation Service in the western states.

Graduates from either of these programs are qualified for positions such as Forest Ranger, Soil Conservationist, and Range Manager under the United States Civil Service system with such federal agencies as the Forest Service, Soil Conservation Service, Indian Service, and Bureau of Land Management. At present an acute shortage exists in qualified men for such positions, and employment opportunities are excellent.

The graduates from these programs are qualified for many private jobs such as operating a livestock ranch, technical foreman for livestock companies, adviser to land management companies, and range land appraiser. State land management and both federal and state research opportunities are also unusually good.

The degree of Master of Science in Range Management is granted upon completion of an arranged course of study. Adequate facilities are available to allow emphasis upon such related fields as forestry, soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in range management or a related subject is prerequisite to advanced study.

To a selected few students, a program of instruction and research leading to the degree of Doctor of Philosophy also is offered. Students having the bachelor's or master's degree should contact the department head for information concerning their eligibility for study toward this degree.

There are available to advanced senior students and to graduate students a number of assistantships which will defray most of the costs of attending school. Such assistantships involve part-time work for the department as research or teaching assistants and generally pay one hundred dollars per month or more. Several of these assistantships are available each year and interested students at Utah State Agricultural College or other accredited colleges should apply to the department head for further details.

## COURSES OF STUDY

### Freshman and Sophomore

Students majoring in range management take the same course as all other students of the School of Forest, Range, and Wildlife Management during the freshman and sophomore years (see pages 3 and 4.) This enables students to transfer without penalty from one department to another within the School at any time previous to their junior year.

#### Junior

		F	W	S
*Botany 108 .....	Agrostology .....	...	4	...
Range 126 .....	Plant Ecology .....	5	...	...
Range 162 .....	Range Management .....	5	...	...
Wildlife 150 .....	General Wildlife Management .....	...	...	5
*Range 177 .....	Forbs and Browse .....	...	...	3
*Range 179 .....	Poisonous Plants .....	2	...	...
For. Mgmt. 132 .....	Public Land Administration .....	...	3	...
*A.H. 110 .....	Beef Cattle Production .....	3	...	...
*A.H. 125 .....	Sheep Production .....	...	3	...
Botany 120 .....	Plant Physiology .....	...	5	...
Range 196 or 197 .....	Range Field Problems .....	...	...	3
<sup>1</sup> English 112 .....	Junior English .....	...	...	4

#### Senior

		F	W	S
Range 164 .....	Technical Problems in Range Management..	...	3	...
*Range 181 .....	Range Economics .....	...	3	...
Range 192, 193, 194 .....	Range Seminar .....	2	2	2
*For. Mgmt. 101, 102 .....	Forest Survey .....	3	3	...
Range 180 .....	Watershed Management .....	4	...	...
*An. Hus. 150 .....	Animal Nutrition .....	...	4	...
Range 163 .....	Range Improvement .....	2	...	...



## Suggested Electives

		F	W	S
Agron. 131, 132 .....	Applied Statistics .....	3	3	---
Agron. 114 .....	Soil Conservation and Survey .....	---	---	5
W.L. 155 .....	Economic Wildlife .....	---	3	---
For. Mgmt. 118 .....	Forest Protection I .....	3	---	---
Agron. 103 .....	Forage Crops .....	3	---	3
Ag. Econ. 106 .....	Land Economics and Utilization .....	---	---	5
Vet. Sci. 120 .....	Animal Hygiene .....	---	---	4
Agron. 155 .....	Soil and Plant Relations .....	---	3	---
Bot. 121 .....	Water Relations of Native Plants .....	---	3	---
Geol. 115 .....	Adv. Physical Geology .....	5	---	---
Agron. 160 .....	Genesis and Morph. of Soils .....	---	3	---
Chem. 90 .....	Biochemistry .....	5	---	---
Zool. 2 .....	Zoology .....	5	---	5
Zool. 112 .....	Genetics .....	5	5	5

## SOIL CONSERVATION AND WATERSHED MANAGEMENT

An option in soil conservation and watershed management is allowed with substitution of the following courses for those marked (\*) above and for An. Hus. 10 in the sophomore year.

		F	W	S
Agronomy 103 .....	Forage Crops .....	---	---	3
Agronomy 114 .....	Soil Conservation and Survey .....	---	---	5
Agronomy 155 .....	Soil and Plant Relations .....	---	3	---
Ag. Eng. 108 .....	Eng. Aspects of Soil and Water Cons. ....	---	---	4
Geology 115 .....	Advanced Physical Geology .....	5	---	---
C. Eng. 171 .....	Hydrology .....	3	---	---
Range 176 .....	Range Forage Plants .....	---	4	---
Botany 121 .....	Water Relations of Native Plants .....	---	3	---

## MINOR—RANGE MANAGEMENT

The following courses in Range Management are suggested for students who wish to minor in this field. (Requirements subject to change upon approval of the department head.): Range 126, Plant Ecology, 5 credits; Range 160 or 162, Principles of Managing Range Lands, 5 credits; Range 176, Range Forage Plants, 4 credits; Range 181, Range Economics, 3 credits; Range 192, 193, 194, Range Seminar, 6 credits.

## Description of Courses

**98. Range Practice.** Field practice in problems of range land analysis and correlation of land uses. Lab. fee \$5.00. Summer Camp (2) **Smith**

**126. Plant Ecology.** Analysis of habitat factors that influence plant growth and distribution. Attention to plant succession and competition and to plant indicators. Prerequisites: Bot. 30; Agron. 56 or 58. (5F) **Stoddart**

**160. Principles of Managing Range Lands.** A general course designed to give students not majoring in the field a knowledge of how to evaluate, increase, and perpetuate range. Field trips and laboratory work on range plants. Credit not allowed students having credit in R.M. 162. Prerequisite: Bot. 25. Four lectures, one lab. (5S) **Cook**

**162. Range Management.** Problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisites: Bot. 30 and Range 98. (5F) **Cook**

1—English 111 may be substituted for English 112.



**163. Range Improvement.** Methods and problems involved in seeding range lands, improving stock watering facilities, and fencing ranges, terracing, water spreading and use of dams on range lands. Prerequisites: Range 160 or 162. Two lectures. Field trips arranged. (2F) **Harris**

**164. Technical Problems in Range Management.** Specialized problems in range management and range administration encountered by the technician. Prerequisites: Range 160 or 162. (3W) **Stoddart**

**176. Range Forage Plants.** Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Prerequisite: Bot. 30. (4W) **Harris**

**177. Forbs and Browse.** A study of forbs and browse including identification, region of growth, ecology, and forage value. Prerequisite: Bot. 30. (3S) **Harris**

**179. Poisonous Plants.** Important poisonous plants, including general methods of livestock handling and range management practices, identification, region of growth, ecology, poisoning symptoms, remedies, and control methods. Prerequisite: Botany 30. One lecture, one laboratory. (2F) **Harris**

**180. Watershed Management.** Floods, soil erosion and runoff on range and forest lands, effects of vegetation in equalizing runoff and preventing erosion, and methods of rehabilitating damaged watersheds. Prerequisite: Range 126. Three lectures, one lab. (4F) **Smith**

**181. Range Economics.** Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 160 or 162. (3W) **Smith**

**192, 193, 194. Range Seminar.** A systematic review of range management and related subjects. Prerequisite: Range 160 or 162. (2F, 2W, 2S) **Staff**

**195. Range Problems.** Individual study and research upon a selected range problem. (1-3 F, W or S) **Staff**

**196, 197. Range Field Problems.** Field study of range management operation and research. Courses 196 and 197 given alternate years. (3S) Fee \$30.00 **Smith**

**200. Range Thesis.** Original research and study on a problem in range management. Open only to graduate students. (1-15F, W or S) **Stoff**

**204. Land Use Seminar.** Current problems and practices in wildland management and research with especial emphasis on the western range. Required of all range management graduate students each fall quarter. (1F) **Harris**

**205. Seminar in Range Nutrition.** Problems in management and research in the field of plant and animal nutrition on the western range. (2W) **Cook**

**206. Research Methods.** A study of research methods in range management and related subjects. (2W) **Stoddart**

**281. Advanced Range Economics.** Advanced study of economics of various systems of range management, range seeding, land operation, and livestock management. Prerequisite: Range 181. (2S) **Smith**

**282. Vegetation Influences.** Advanced study of influences of vegetation upon the hydrological cycle, influence of vegetation on percolation of ground waters, runoff, and the regimen of streams. Prerequisite: Range 180. (2W) **Smith**

## Wildlife Management

**W. F. Sigler**, Professor and Head of Department; **G. H. Kelker**, Professor; **A. W. Stokes**, Assistant Professor. **J. B. Low**, Professor and Biologist; **O. B. Cope**, Professor and Fishery Biologist; **O. P. Ball**, Associate Professor, Fishery Biologist; and **M. Laakso**, Assistant Professor and Fishery Biologist, U. S. Fish and Wildlife Service.

Upon completion of basic courses and the upper-division requirements outlined in the study program, students are granted the degree of Bachelor of Science, major

in Wildlife Management. Prospective wildlife management majors should elect Zoology 3, 4, and 13 in the sophomore year. These classes are prerequisite to all wildlife classes.

Course work of the junior year provides comprehensive basic training in general wildlife management. The student shall choose one of three options to be completed in the senior year. The option in management of big game stresses the economic and ecological relationships of large mammals to forest and range, with emphasis on western conditions. The second option, featuring small game and furbearers, considers representative areas of the United States for illustrative purposes in the management of each game bird or mammal. The fishery option considers the production of both cold water and warm water fish in relation to land use. Land utilization often seriously affects the water habitat. Training is, therefore, given in survey work of the water and the land from which it drains. Also, the student participates in creel censuses, measures the growth and productivity of fish in inland waters, and helps in various forms of habitat improvement.

Any one of 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 listed by the Graduate School, a Master of Science or Doctor of Philosophy degree in Wildlife Management or Fishery Management is granted. A period of one to three or more years, depending upon the thesis problem and the amount of time that the student can devote to his studies, is necessary to complete all requirements for these degrees.

Through co-operation of the Fish and Wildlife Service, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the co-operatively sponsored Wildlife Research Units was established at Utah State Agricultural College in 1935.

Wildlife Research Unit funds are available for six graduate research assistantships for students working toward a Master's degree or the Ph.D. degree in Wildlife Management. The Wildlife Management department also has one teaching assistantship. Candidates for assistantships are chosen from applicants who have a bachelor's degree in Wildlife Management or a related field from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before April 1.

A small number of part-time fishery positions are available during the school year with the Rocky Mountain Fishery Investigations of the U. S. Fish and Wildlife Service. Positions in summer work are filled through this and other agencies to give valuable practical experience in fishery techniques which may be gained by working in this capacity.

### COURSE OF STUDY

For Freshman and Sophomore years, see basic courses for Forest, Range, and Wildlife Management

#### Wildlife Management

Courses required for graduation

		F	W	S
Wildlife 146	Principles of Wildlife Mgmt.	3	...	...
Wildlife 157, 158, 159	Seminars	1	1	1
Wildlife 160	Animal Ecology	5	...	...
Wildlife 171	Junior Field Problems	...	...	2
Wildlife 172	Problem Orientation	...	3	...
Wildlife 175	Wildlife Law Enforcement	...	3	...
Range 126	Plant Ecology	5	...	...
Agronomy 131	Applied Statistics	3	...	...
<sup>1</sup> English 112	Junior English	...	...	4

The student must complete all course work in one of the three options to meet requirements for graduation. He may choose suitable electives from the other two groups to broaden his training.

**A. Big Game Management:**

	F	W	S
Wildlife 146 ..... Management of Upland Game .....	---	---	3
Wildlife 153 ..... Management of Big Game .....	---	5	---
For. Mgmt. 101, 102 ..... Forest Survey .....	3	3	---
Range 162 ..... Range Management .....	5	---	---
Range 176 ..... Range Forage Plants .....	---	4	---
Range 180 ..... Watershed Management .....	4	---	---
Zoology 122 ..... Mammalogy .....	---	4	---

**B. Small Game and Furbearer Management:**

	F	W	S
Wildlife 146 ..... Management of Upland Game .....	---	---	3
Wildlife 147 ..... Mgmt. of Waterfowl and Furbearers .....	---	---	5
Wildlife 161 ..... Limnology .....	4	---	---
Botany 112 ..... Aquatic and Marsh Plants .....	3	---	---
Range 162 ..... Range Management .....	5	---	---
Zoology 121 ..... Ornithology .....	---	---	4

**C. Fishery Management:**

	F	W	S
Wildlife 147 ..... Mgmt. of Waterfowl and Furbearers .....	---	---	5
Wildlife 161 ..... Limnology .....	4	---	---
Wildlife 165 ..... Fishery Management .....	---	---	3
Wildlife 169 ..... Techniques in Fishery Management .....	---	5	---
Bot. 112 ..... Aquatic and Marsh Plants .....	3	---	---
Range 180 ..... Watershed Management .....	---	4	---
Zoology 155 ..... Ichthyology .....	---	4	---

**Description of Courses**

**99. Wildlife Practice.** Integrated studies of wildland populations in relation to other forms of life and to other land uses. Lab. fee \$5.00. Summer Camp. (2) Staff

**145. Principles of Wildlife Management.** Properties of animals and their habitats in relation to general management practices. Field trips. Prerequisite: Summer Camp. (3F) Stokes

**146, 246. Management of Upland Game.** Taxonomy, life histories, distribution, environmental needs, enemies, and plans for management of game birds and small mammals. Prerequisites: Wildlife 99 and 145. Additional work required of graduate students. (3S) Stokes

**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. Prerequisites: Wildlife 99 and 145. Additional work required of graduate students. (5S) Stokes

**150. General Wildlife Management.** Principles of animal ecology and wildlife management; life histories, ecology, economics and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife majors. Field trips arranged. (5S) Kelker

**153, 253. Management of Big Game.** Life histories, distribution, numerical variation, enemies, and plans for management of native big game animals. A term paper required of graduate students. (5W) Kelker

**155. Economic Wildlife.** General importance of wildlife resources; natural history, economic values and control methods for rodents and predators; identification

1—English 111 may be substituted for English 112.

2—Or Hydrology Civil Engineering 171.

of skulls and skins; a brief evaluation of hawks and reptiles. Particularly adapted for students in forest management, range management, and agriculture. (3W) (Not taught in 1954-55) **Kelker**

**157, 158, 159. Wildlife Seminar.** Discussion of current developments in wildlife management. (1F, 1W, 1S) **Staff**

**160. Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to interrelationships of biotic communities. (5F) **Kelker**

**161, 261. Limnology.** Physical, chemical, and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisites: Bot.: 30 and Zool. 13. (4F) **Sigler**

**162. Fishery Ecology.** Importance of the animal environment of fresh water fishes. Food organisms, predation, parasitism, and economic importance. Prerequisites: Zool. 3, 4, 13. Field trips, laboratory, lectures. (3F) **Cope**

**164. Fish Populations.** General population characteristics, methods of enumeration, and determination of mortalities. Paper required. Prerequisite: Permission of instructor. (2W) **Laakso**

**165, 265. Fishery Management.** Principles and techniques of lake, pond, and stream improvement; ecology of game fishes, propagation methods, and common fish diseases. Prerequisites: Zool. 155 and Wildlife 99. (3S) **Sigler**

**166. Marine Fish and Fisheries.** Ecology of marine environment—chemical, physical and biological characteristics of the oceans. Each group of marine fish is evaluated from a taxonomic, ecological, and economic viewpoint, emphasizing the commercial marine fisheries of the world. Special consideration to oceanographic investigations and techniques designed to evaluate problems associated with commercial fisheries. Lecture and laboratory periods. Prerequisite: Zoology 155. (3F) **Ball**

**169, 269. Techniques in Fishery Management.** Mechanics of collecting and analyzing life history material of fishes. Prerequisites: Zool. 155, and Wildlife 99 and 161. (5W) **Sigler**

**170. Wildlife Problems.** Individual study and research upon a selected wildlife problem approved by the instructor. Prerequisite: Wildlife 172. (1-3F, W, or S) **Staff**

**171. Junior Field Problems.** Study of wildlife management operations by various agencies in the Intermountain Region. (2S) Fee \$35.00. **Sigler**

**172. Problem Orientation.** A discussion of needs of and approach to wildlife investigations: analyzing the problem, presenting data, and drawing conclusions relative to research in wildlife management. (3W) **Kelker**

**175. Wildlife Law Enforcement.** Review of state and federal regulations of fish and game; discussions of apprehension of violators; collection of evidence, and its use in the court. Offered in alternate years. (3W) **Sigler**

**257. Graduate Seminar.** 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) **Low**

**259. Graduate Seminar.** Review of current literature pertaining to the completion and publication of technical papers. (2S) **Sigler**

**260. Advanced Animal Ecology.** Population dynamics, animal behavior, and other ecological aspects not covered in W.M. 160. Prerequisite: W.M. 160 or equivalent. (3F) **Stokes**

**270. Research and Thesis.** A research problem chosen, the project outlined, and data collected, analyzed, and summarized, and thesis prepared by the student. (5-15F, W, S, SS) **Staff**

## **SCHOOL OF ECONOMICS**

**ETHELYN O. GREAVES, Dean**

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## General Information

All home economics courses are planned to provide for well-rounded personal development, to help students become more effective members of the home and the community and to train for a professional career.

Home and family life is related to all areas in home economics. Thus courses are planned to prepare young women to carry the art and science of skilled home living into the various institutions of modern complex society. During the first two years, emphasis is placed on general education and on basic training for home and family living. In the junior and senior year the student follows a program in one of the professional curricula, directed toward a career in some phase of home economics. Accordingly students may elect majors leading to a Bachelor's Degree in the following divisions: Child Development and Parent Education, Clothing, Textiles and Related Arts, Foods and Nutrition, Household Administration, and Home Economics Education.

The chief professional opportunities open to graduates in the School of Home Economics are in homemaking, teaching, extension service, institutional management, research, and home economics in business.

## GENERAL REQUIREMENTS

**Lower Division Requirements**—See "Academic Regulations" page 52

**Core Requirements**—All curricula in the School of Home Economics are based on a required core of courses designed to give a broad education for family and community living. They emphasize practical aspects of home economics and are planned to give students desirable basic training in activities related to successful management of a home. These requirements make up a large proportion of the work of the freshman and sophomore years. Courses which meet core requirements of the School of Home Economics are:

H. Ad. 10	Introduction to Home Economics .....	1 credit
CTRA 8	Clothing for the College Girl .....	5 credits
FN 5	Nutrition .....	3 credits
FN 24	Food Preparation .....	5 credits
CD 67	Child in the Family .....	5 credits
H. Ad. 149	Home Management .....	3 credits

## 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 prepare the student for employment in specific occupations.

Requirements for two-year terminal course are as follows:

1. Complete a major of 30 credits in one or more closely related departments of the School of Home Economics.
2. Complete a minor of 15 credits related to or basic to the major—not necessarily in the School of Home Economics.
3. Twenty-four credits in basic groups:
  - (a) Language, 9 credits; (b) Exact Science, 5 credits; (c) Biological Science, 5 credits; and (d) Social Science, 5 credits.
4. Electives—21 credits.
5. Physical Education—6 credits.



## Child Development and Parent Education

**Bruce Gardner**, Associate Professor and Head of Department; **Ruth Harris**, **Dorothy Lewis**, Assistant Professors.

A Bachelor of Science degree and a Master of Science degree may be earned in Child Development.

Students majoring in Child Development and Parent Education must complete, in addition to the Home Economics core courses, the following: Child Development 80, 138, 174, 175, and 190; Speech 118 or English 24; Psychology 105; H. Ad. 150; Zoology 111; Sociology 60. The remaining credits may be selected, in conference with the major adviser, from the approved courses listed below: C. T. & R. A. 185; Woodwork 74; Psychology 123 and 145; Art 34; Music 131.

Students expecting to teach in kindergarten or elementary grades must meet the state requirements for certification. It is recommended that they adopt a major in Elementary Education as well as a major in Child Development. These majors relieve the student of the requirement for a minor. Arrangements for practice teaching in the Nursery School (C.D. 175) should be made in advance with a Child Development staff member. Arrangements for practice teaching in the elementary grades should be made in advance with the supervisor of the Whittier School. State requirements for certification include the following courses: Education 50, 103, 104, 015, 106, 114; Public Health 155; Psychology 105 and 108; English 24.

### CURRICULUM IN CHILD DEVELOPMENT AND PARENT EDUCATION

Junior Year		Senior Year	
Course	Cr.	Course	Cr.
English 110 .....	4	C.D. 174, 175 and 190 .....	9
Psych. 105 .....	3	Household Adm. 149 and 150 .....	7
Zool. 111 .....	4	Ed. 105 .....	3
Pub. Health 155 .....	3	Ed. 106 .....	12
Psych. 108 .....	3	Education Electives .....	2-3
Ed. 103 .....	4	Other Electives .....	17
Ed. 104 .....	3		
Ed. 114 .....	3	Total .....	50-51
C.T.&R.A. 185 .....	3		
C.D. 138 .....	5		
Electives .....	16		
Total .....	51		

**67. The Child in the Family.** To help students develop a philosophy of family living as desirable background for the child; understanding of reproduction, prenatal care, and care of the mother and baby during the first year of the child's life; fundamentals of growth and development; and a beginning concept of guidance. Observation in the Nursery School arranged. (5F, W, and S) **Gardner**

**80. Guidance of the Young Child.** Review of developmental principles with special emphasis on social-emotional growth; fostering growth through creative materials and play equipment; guidance philosophy, principles and techniques. Three lab. hours weekly arranged at time of registration. Especially recommended for Home Economics majors. Prerequisite: C.D. 67. (F, W, S) **Lewis**

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

**125. Parent Education.** Application of fundamental principles of child development and family relationships to educational programs for parents. For students who have some background in child development or related areas. (3W, S) **Gardner**

**138. Survey in Child Development.** History of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration, a two-hour nursery school teaching laboratory weekly. Recommended for all majors, spring quarter of junior year. Open to Child Development majors only. (5S) **Harris; Lewis**

**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. (3F, W, S) **Harris**

**175. Practice Teaching in the Nursery School.** An opportunity to apply principles of child guidance in the nursery school. Open only to Child Development majors and minors. (5F, W, S) **Staff**

**176. Advanced Practice Teaching in the Nursery School.** Continuation of course 175; 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, S) **Staff**

**190. Seminar in Child Development.** Discussions and reports of current readings in Child Development. (1S) **Staff**

**210. Research for Master's Thesis.** **Staff**

## Clothing, Textiles, and Related Arts

**Florence Gilmore**, Associate Professor, and Head of Department; **\*Mignon Perry**, Assistant Professor; **Rhea Gardner**, Associate Professor, Extension Home Furnishings Specialist; **Theta Johnson**, Associate Professor, Extension Clothing Specialist; **Oleta P. Moore** and **Ruth V. Clayton**, Instructors; **Oleta P. Moore** and **Ruth V. Clayton**, Instructors.

**Effie Barrows**, Professor Emeritus.

A Bachelor of Science degree and a Master of Science degree are offered in Clothing Textiles, and Related Arts.

Students who elect Clothing, Textiles and Related Arts as their majors are required to complete the following courses in addition to the Home Economics core courses: Clothing 24, 25, 105, 115, 125, 133, 140, 165, 170, 185, 191; Household Administration 150; 18 credit hours in the art department to include Art 1, 2, 3, 32 with the additional hours in 111, craft or studio classes.

Students who elect to minor in Clothing, Textiles and Related Arts are required to complete the following courses in addition to Home Economics core courses: C.T.&R.A. 24, 115, plus 7 hours of electives.

The Clothing, Textiles, and Related Arts Department in co-operation with other departments offers majors in the following fields: Costume Design, Textile Design and Research, Teaching of Clothing and Textiles, Home Decoration, and Fashion Merchandising.

In addition to major requirements and Home Economics core, it is recommended that the following courses be taken when planning for a definite occupation:

**Fashion Merchandising.** Those preparing for Fashion Merchandising may wish to complete a major in Clothing, Textiles and Related Arts and add the following courses: Bus. Ad. 62, 63, 109, 149, 151, 153, 156; Psy. 155; Art 1, 2, 3, 32, 110, and other art courses to complete a minor; Econ. 51.

**Costume Design:** Those preparing for costume design may wish to complete a major in Clothing, Textiles, and Related Art and add the following courses: Art 1, 2, 3, 110, 111, 132, 135.

\*On leave.

**Education.** Majors in Clothing and Textiles who desire to teach in secondary schools should complete a double major of Vocational Home Economics and Clothing and Textiles.

**Textile Research.** Those preparing for Textile Research should complete a double major in Clothing, Textiles and Related Arts and Exact Science.

**Textile Design.** Those preparing to design textiles may wish to complete a double major of Clothing, Textiles and Related Arts and Art. The following courses in Art are required: Art 1, 2, 3, 32, 111, 127 and additional work to complete a major.

**Home Decoration.** Household Adm. 65, 100, 149; Landscape Arch. 3; Art 1, 2, 3, 26, 32, or 132, 122, 123.

**Field Trip.** A two-day field trip to be taken in the Spring quarter is required of juniors and elective for seniors majoring in Clothing, Textiles and Related Arts. The purpose is to study processes related to manufacturing and retailing of fabric and apparel; also to become acquainted with opportunities and requirements for employment in designing, manufacturing, merchandising, advertising, and home decoration.

**Home Project.** A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing, Textiles and Related Arts. Clothing 25 is a prerequisite. The project is turned in to the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

### CURRICULUM IN CLOTHING, TEXTILES, AND RELATED ARTS

Junior Year		Senior Year	
Course	Cr.		
C.T.&R.A. 105 .....	3	C.T.&R.A. 125 .....	5
C.T.&R.A. 115 .....	3	C.T.&R.A. 170 .....	3
C.T.&R.A. 133 .....	3	C.T.&R.A. 185 .....	5
C.T.&R.A. 140 .....	3	C.T.&R.A. 191 .....	2
C.T.&R.A. 165 .....	3	C.T.&R.A. 175* .....	3
English 110 .....	4		
Art Electives .....	5	Total .....	18
Other Electives .....	27		
Total .....	51		

**5. Dress and Personality.** Open to all college girls desiring assistance in planning an selecting clothes to suit personality. No construction. Girls who expect to major in Home Economics should take 8 instead of this course (2F, W) **Staff**

**6. Dress Construction.** Open to all college girls not majoring in Home Economics who wish to develop skill in construction techniques. Construction of a speed project, and a tailored dress, and a skirt. (5F, W, S) **Moore**

**8. Clothing for the College Girl.** Designed to assist the college girl in selecting and adapting her clothes in terms of campus activities. The course includes a unit on dress and personality besides a speed project and a tailored dress. Required of all students majoring in Home Economics. (5F, W, S) **Gilmore; Moore**

**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. (2W) **Gilmore**

\*Given in alternate years; given in 1954-55.

**24. Textile.** A study of fibers, yarns, fabrics, and finishes related to consumer problems. (3F, W, S) **Gilmore**

**25. Clothing Selection and Construction.** Consideration is given to alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, good procedures and finishes. Prerequisite: Clothing, Textiles and Related Arts 8, 24, and prerequisite or parallel Art 2. (3W, S) **Gilmore**

**33. Home Furnishings.** Planned to develop skill in selecting and techniques in making, remodeling, and caring for home furnishings. Laboratory includes instruction on making draperies, refinishing and upholstering furniture. Open to all college students. (3F, W, S) **Clayton**

**41. Weaving.** Designing and weaving of personal and household articles. Aim of the class is to develop understanding of basic fabric construction and skill in various techniques of hand weaving. (F, S) Credit arranged. **Clayton**

**105. History of Costume.** Shows social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. (3F) **Clayton**

**115. Art in Everyday Living.** Study of art elements and principles of design as applied to dress, the home and daily living. Prerequisites: Clothing, Textiles, and Related Arts and Home Economics majors: Art 1 and 2; Clothing, Textiles, and Related Arts 8. For others interested, Art and Clothing to satisfy the instructor. (3F, W) **Clayton**

**125. Applied Costume Design.** Creative experience in dress designing by draping on the dress form. Emphasis placed on fitting and understanding the effect of pattern, grain, and texture on design and dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles, and Related Arts 25, 115. (5W) **Clayton**

**133. Home Decoration.** Laboratory experience in actual problems of home decoration, such as planning functional interiors around the family situation, refinishing woods, planning coordinated color schemes, mixing paint, etc. (3S) **Clayton**

**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 furnishing. (3W) **Clayton**

**141. Weaving.** Advanced problems in weaving. Aim of the class is to develop an understanding of different weaves. Instruction in pattern draft reading. (F, S) Credit arranged. **Clayton**

**165. Tailoring.** Application of techniques used in tailoring suits and coats. Prerequisite: Clothing, Textiles and Related Arts 25, 115. (3F, W) **Gilmore**

**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 25, 115, and 125. (3S) **Staff**

**175. Textile Testing.** Physical and chemical properties of textiles, fibres, laboratory and household tests used in their identification, and application of these factors to choice and care of the fabrics. Consideration to use of microscope, physical testing and quantitative analysis. Prerequisites: Clothing, Textiles, and Related Arts 24; Chem. 10, 11, and 12 recommended. Outside work required. Alternate years only; offered in 1954-55. (3S) **Gilmore**

**185. Family Clothing Problems.** Emphasis on economic, sociological and psychological problems. Practical problems will include: clothing budgets, selection and construction of children's clothing, and care and renovation of clothing. Prerequisite: Clothing, Textiles and Related Arts 8; 24, recommended. (3F, S) **Gilmore**

**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. **Staff**

**191. Readings.** Reports and discussions on current literature in Clothing, Textiles, and Related Arts. (2S) **Gilmore**

**210. Research for Master's Thesis.** **Gilmore**

## Foods and Nutrition

**Ethelyn O. Greaves**, Dean and Head of Department; **Una Vermillion**, **Ethelwyn Wilcox**, Professors; **Edna Page**, Associate Professor; **Priscilla Rowland**, **Margaret B. Merkley**, Assistant Professors; **Elna Miller**, Extension Nutritionist, Professor.

Students majoring in Foods and Nutrition are required, in addition to the Home Economics core, to complete the following courses: Foods and Nutrition 25, 107, 140, 141, 144, 145, 146, 180, 191; Household Administration 150; Chemistry 10, 11, 12; Biochemistry 90 or 190.

Students majoring in Dietetics or Institutional Management must meet the requirements for the Foods and Nutrition major. In addition, the following courses are required: Bacteriology 10; Physiology 4; Psychology 53; Economics 51; Sociology 70; Business Administration 109; Psychology 102; Education 120; Foods and Nutrition 182 and 183.

### CURRICULUM IN FOODS AND NUTRITION

Junior Year		Senior Year	
Course	Cr.	Course	Cr.
F. & N. 107 .....	3	F. & N. 140 and 141 .....	5
H. Adm. 150 .....	4	F. & N. 144 .....	2
F. & N. 180 .....	5	F. & N. 145 .....	4
Biochemistry .....	5	F. & N. 146 .....	2
English 110 .....	4	F. & N. 191 .....	1
Electives .....		Electives .....	

### Courses

**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. Open to all students. (3F, W, S) **Rowland; Page**

**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. (3W) **Rowland**

**24. Food Selection and Preparation.** Principles of food selection and preparation. Open to all students. Three lectures and two labs. (5F, W, S) **Page; Rowland; Merkley**

**25. Meal Preparation for the Family.** Planning, preparing and serving meals for the family. Consideration is given to nutritional adequacy of meals at different income levels and for special occasions. Prerequisite: Foods 24. (3F, W, S) **Rowland**

**100. Quantity Food Preparation for School Lunch and Special Occasions.** Meets needs of Home Economics Education students. Emphasis on planning balanced school lunches and on organization, preparation, and service of foods in large quantities for special events. (3S) **Vermillion**



**107. Experimental Cookery.** Development of experimental methods; their application to investigation in cookery and food preservation; literature of the field; preparation of the student for independent investigation in foods. Prerequisites: Organic Chemistry, Foods 24 and 25. Offered in 1955-56. (3S) **Page**

**140. Advanced Nutrition.** The fundamental principles of human nutrition and their application to the individual and family group. Prerequisite: Biochemistry 190 or equivalent. (3F) **Wilcox**

**141. Advanced Nutrition.** Nutritional requirements of the mother during pregnancy and lactation; nutrition of child through infancy to adolescence. (2W) **Wilcox**

**142. Nutrition and Dietetics.** Fundamentals of chemistry and biology applied to human nutrition with practice in calculation of dietaries. Required of all Home Economics Education students. Prerequisite: Organic Chemistry. (3F) **Page**

**144. Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations, a dietary study, and a project in animal experimentation. Prerequisites: Biochemistry 190, or permission of instructor. (2F) **Wilcox**

**145. Diet Therapy.** Application of dietetic principles to problems of disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. (4W) **Page**

**146. Food Technology.** Manufacture and preservation of food products and influence of these processes on physical, chemical, and nutritive values of foods. Prerequisites: Bacteriology 10, Foods 24 (2F) **Greaves**

**160. Special Problems.** Open to qualified students majoring in Foods and Nutrition upon consultation with instructor. (F, W, S), time and credit arranged. **Staff**

**180. Quantity Food Preparation.** Application of the principles of food cookery applied to large quantity preparation. Standardization of food quality, production costs and menu planning studied. College food service units used as laboratories. Open to juniors majoring in dietetics or institutional management. (5W) **Vermillion**

**182. Institutional Organization and Management.** Principles of scientific management applied to food service units. Emphasis on organization set-ups, personnel relationships, records, sanitation and other managerial problems. (3F) **Page; Vermillion**

**183. Food Selection and Purchase for Institutions.** Consideration of marketing functions as they pertain to food production, transportation, and consumption. Purchase specifications and methods. Field trips included. Prerequisites: 180, and 182. (3S) **Vermillion**

**191. Seminar in Foods and Nutrition.** Reports, discussions, and review of recent scientific literature in nutrition. Prerequisite: Foods and Nutrition 141 or 142. (1S) **Staff**

**201. Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral and vitamin determinations. Prerequisite: Chemistry 190 or 191, or equivalent. (F, W, or S), time and credit arranged. **Wilcox**

**202. Biological Assay of Foods.** Problems in biological assay of vitamins in foods. (F, W, S), time and credit arranged. **Wilcox**

**103 or 203. Nutrition Laboratory.** Microchemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chemistry 190 or 191, or equivalent (F, W, S), time and credit arranged. **Wilcox**

**207. Advanced Experimental Foods.** Development of experimental method and its application to cookery. (F, W, S), time and credit arranged. **Page**



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

Wilcox; Page

243. Recent Developments in Nutrition. Study of problems in nutrition selected according to needs of students. Prerequisite: Nutrition 140. (2W, S) Wilcox

260. Special Problems. Open to graduate students in Foods and Nutrition. (F, W, S), time and credit arranged. Staff

291. Graduate Seminar. Open to graduate students in Foods and Nutrition. (F, W, S), time and credit arranged. Staff

## Household Administration

Ethelyn O. Greaves, Professor; Waneta Wittler, Assistant Professor; Rhea H. Gardner, Associate Professor, Extension Home Management Specialist; Marjorie P. Bennion, Research Instructor.

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying the effects of social and economic forces on the home and its management.

Students majoring in Household Administration are required, in addition to the Home Economics core, to complete the following courses: Household Administration 55, 65, 100, 150; C.T.&R.A. 33, and 115.

### CURRICULUM FOR HOUSEHOLD ADMINISTRATION

Junior Year		Senior Year	
Course	Cr.	Course	Cr.
H. Ad. 149 .....	3	H. Ad. 150 .....	4
H. Ad. 100 .....	2	C.T.&R.A. 115 .....	3
Electives .....	43	English .....	4
		Electives .....	37
Total .....	48	Total .....	48

10. Introduction to Home Economics. A course designed to help freshmen students to become better adjusted to college life. Includes help with the library, studying, and how to understand the use of the college catalog. Special help is given on the selection of a major in Home Economics. (1F) Wittler

55. Family Finance. Includes the study of personal and family finance with emphasis on finance plans and investments. (2F, or W) Wittler

65. Housing. Presents housing needs and practices affecting housing construction and home ownership, also includes evaluation of house plans. (3F, W, or S) Wittler

100. Household Equipment. Selection, method of operation, and maintenance of equipment used in the home, with emphasis on kitchen and laundry equipment. (2S) Wittler

149. Home Management. Principles of household management. Includes a philosophy of homemaking, use of human and material resources, and improvement of housing as is related to family living. (3F, W, or S) Greaves

150. Home Management House. Residence students are directed in practical management of home experiences. Required of all Home Economics majors. Elective for other students upon consultation with the advisor of Home Management House. Prerequisites: H. Ad. 149; F. & N. 24 and 25. Time arranged. (4F, W, or S) Wittler

160. Special Problems. Individual study of management problems in which upper division student wants special help. Consult department head for arrangements. (F, W, or S), time and credit arranged. Staff

## Home Economics Education

Helen L. Cawley, Associate Professor, and Head of Department; Margaret E. Merkley, Instructor.

A Bachelor of Science degree and a Master of Science degree may be earned in Home Economics Education.

The following professional program prepares graduates for teaching courses in homemaking. It certifies graduates to teach all phases of homemaking in Utah schools, including high schools having George-Barden (vocational homemaking) courses.

It is important that students register with the instructor for Education 121 and 122 two quarters before they plan to do their student teaching. This provides the time necessary to obtain co-operation of schools to provide enough teaching assignments for those registering in these courses.

### FRESHMAN AND SOPHOMORE YEARS

In addition to the Home Economics core courses, the following lower division courses are required to meet Utah certification requirements in Home Economics Education: Child Development 80; Sociology 60; Clothing, Textiles and Related Arts 24 and 25 and 33; Household Administration 55 and 65; Foods and Nutrition 25.

Other elective courses in Home Economics and related subjects should be selected carefully by the student.

To meet college group requirements, the student planning to major in Home Economics Education needs to keep in mind:

1. Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 53.
2. Group requirement recommendations: Zoology 1 or Botany 1 (Principles of Biology); Bacteriology 10 or Physiology 4; Economics 51 or Agricultural Economics 62; English 24; Music 1; Speech 1; History, Literature, Political Science and Sociology 10 or 70.
3. Elective recommendations: Students are advised to consider:
  - a. Developing a subject interest into a teaching minor; e.g., Art, Commerce; English, Music, Physical Education, and Social Science.
4. Home Project: A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing Textiles and Related Arts. Clothing 25 is a prerequisite. The project is turned in to the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

### CURRICULUM IN HOME ECONOMICS EDUCATION

Junior Year			Senior Year		
Course		Cr.	Course		Cr.
C.T.&R.A. 115	.....	3	C.D. 125	.....	3
C.T.&R.A. 165	.....	3	F. & N. 142	.....	3
F. & N. 146	.....	2	H. Ad. 150	.....	4
H. Ad. 149	.....	3	Edu. 112, 121, 122	.....	15
Soc. 60	.....	3	Electives	.....	23
English 110	.....	4			
Edu. 114, 120	.....	6			
Public Health 155	.....	3			
Psych. 102	.....	5			
Electives	.....	16			
Total	.....	48	Total	.....	48

Courses to complete requirements for professional education may be elected. (Check with major professor to be sure requirements for certification are being met.)

The following upper division courses in Home Economics and related departments are recommended as electives: Foods and Nutrition 100; Clothing, Textiles and Related Arts 185; Sociology 160, 162, or 262.

### EXTENSION SERVICE CURRICULA

Requirements for entering the Extension Service as County Home Demonstration Agents:

Completion of Home Economics Education curriculum as outlined, and in addition:

Journalism 12 .....	3
Public Speaking 4 or 5 .....	5 or 3
Sociology 141 .....	3
Extension Methods 151 .....	3

A 3-month training period in a county under supervision is advised of prospective Home Demonstration Agents. Plans for this training are made with Director of Extension Service.

### Courses

**Education 120. Methods in Teaching Home Economics.** Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observation of school activities. 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.) This course should be blocked with Education 122 and with one other 3-hour Education course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W or S) Cawley

**Education 122. Student Teaching in Home Economics.** Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teacher leaves campus the middle five or six weeks of Fall, Winter, or Spring quarter and teaches a full homemaking program each day in an approved school. An occasional student may find it impossible to do student teaching on this block plan. Such a student must receive approval of the instructor of Ed. 121 and 122, 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. Prerequisites: Ed. 120, 121. (8F, W, or S) Staff

**199. Special Problems in Home Economics Education.** Developed around individual needs of students not otherwise provided for in curriculum. (1-2F, W, S) Staff

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

**237. Seminar.** Opportunity for investigation and reporting on individual problems.

### CERTIFICATION REQUIREMENTS FOR TEACHERS OF VOCATIONAL HOMEMAKING IN SECONDARY SCHOOLS

Follow the Home Economics Education curriculum. For transfer students, credits are evaluated by staff members and equivalent course work is accepted. Requirements for certification follow:

## Group I

Nine credits in courses which assist in understanding young people of school age.

†Psychology 102 .....	5
†Public Health 155 .....	3
Psychology 112 .....	3
Education 113 .....	3

## Group II

Six credits in understanding for 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

A total of thirty-three credits in professional education, including Public Health 155, must be presented to meet the requirements for the General Secondary Certificate and the Vocational Homemaking in Secondary Schools Certificate. Special courses recommended for Certification in Vocational Homemaking Education are listed above. These professional courses plus the prescribed subject matter courses in Home Economics are necessary for certification in Vocational Homemaking Education in Secondary Schools.

Types of service available to teachers:

1. Special guidance and help are given teachers who wish to return to school to meet requirements for renewing their certificates.
2. Opportunity to meet certification requirements is offered teachers or other persons.
3. Advanced study leading to Master of Science degree in Home Economics Education is offered.

\*It is necessary to make arrangements for specific Education course with Major professor at time when plans are made for Ed. 121 and 122.

†Required courses.

## **MILITARY AND AIR SCIENCE AND TACTICS**

### **Army and Air Force**

**DEAN CARLTON CULMSEE, Civilian Coordinator**

**COLONEL CALVIN L. PARTIN, Professor of Military Science and Tactics**

**COLONEL HOWARD A. MOODY, Professor of Air Science and Tactics**

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## General Information

Both Army and Air Force ROTC units are established at this institution. Department of Defense policies govern the Army-Air Force ratio for new student entrance into the two programs. All those with a sincere desire to fly and who meet the requirements for flight training are encouraged to enroll in the Air Force ROTC, but the desire of the new student is normally first consideration. Both programs provide many opportunities for leadership development and possibility of a regular commission. Details of each program follow.

## Army ROTC

**Calvin L. Partin**, Colonel, Professor of Military Science and Tactics. Assistant Professors of Military Science and Tactics **Peter J. Lacey Jr.**, Lt. Col., Arty.; **Donald G. Leeper**, Major Ordnance Corps; **Charles F. McCormick Jr.**, Capt., QMC; **Jasper P. Jaques**, Capt., QMC; **Narion G. Larsen**, 1st Lt., QMC. Assistant Instructors: **Karl L. Cooper**, M/Sgt; **Donald K. Bartholomew**, M/Sgt.

Since 1893 military training has been offered as a prescribed part of the college curricula. The Morrill Act of 1862 prescribed two years of military training for all physically qualified male students attending Land Grant colleges. Exempt from this requirement are transferring junior or senior students from a college which has no ROTC unit.

The general objective of the course of ROTC instruction is to produce junior officers who by their education, training and inherent qualities are suitable for continued development as officers in the United States Army. Training in military leadership is emphasized. Instruction is given in subjects common to all branches of the army and is known as a Branch General ROTC Program. As the name implies Reserve Officers Training Corps is an instrument of training and instruction—not conscription. Present regulations provide that students enrolled in the program may be deferred from selective service provided they meet prescribed standards and execute a deferment agreement.

Veterans who have been honorably discharged or transferred to the Enlisted Reserve Corps and relieved from active duty, may be given credit under the provisions of Public Law 81-79th Congress, in lieu of completion of all or part of the basic ROTC courses. Such military service also permits a veteran to apply for advanced ROTC upon completion of lower division requirements.

The four year course in the Reserve Officers Training Corps is divided into the Basic Course and the Advanced Course.

The basic course is normally pursued during the freshman and sophomore years. The completion of the basic course is a prerequisite for graduation unless relieved from this obligation by proper authority. Lower division transfer students must enroll and continue the basic course while in a lower division status.

The advanced course consists of the third and fourth years of the Military Science course and is now co-aligned with the student's junior and senior years. The course is elective, but once entered upon, it becomes a prerequisite for graduation unless released by proper authority.

## Enrollment Conditions

All students formally enrolled in the basic and advanced course must be:

1. Citizens of the United States.
2. Physically qualified. Due allowance is made for defects which are correctable, before the student, who is otherwise qualified, becomes eligible for commissioning.
3. Accepted by the institution as a regularly enrolled student.
4. Be not less than 14 years of age and not have reached 23rd birthday at the time of initial enrollment in basic course.



In addition to the above, all formally enrolled advanced ROTC students must comply with these conditions:

1. Must be under 27 years of age at the time of initial enrollment in advanced course.
2. Successfully complete ROTC qualifying examination and appear before a board of officers.
3. Have completed the basic course or equivalent.
4. Be in good academic standing in the college.
5. Be selected by the PMS&T and the head of the institution.

### MILITARY SCIENCE REGULATIONS

The student, by registration at the Institution, obligates himself to conform to requirements prescribed by the college under regulations of the Reserve Officer's Training Corps. The requirements are: Two years of military training (six credits) are required of all qualified male students. The student must repeat courses failed and earn passing grades to satisfy the Military Science requirements. 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 required to take military training but who fail to register or to report for classes are, with the approval of the President, excluded from all classes in the college. The responsibility of complying rests entirely with the student.

The periods, Monday 3 p.m. through 5 p.m., and Thursday 11 a.m. through 1 p.m. are set aside for Military Drills during the Fall and Spring quarters. Basic and Advanced students must schedule other courses so that they can attend drill during one of these periods.

A student claiming exemption from Military or Air Science must present proof for such exemption at the time of registration. Pending final decision on his request, the student registers for the course prescribed above and enters the work of that course.

Every student registered for Military Science is required to make a uniform deposit of \$4.00 and pay a \$1.00 laboratory fee. The uniform deposit, less the cost of any property lost or damaged, is refunded upon completion of the year or withdrawal from the course.

Credit for Junior Division ROTC will be allowed upon presentation of a Military Training Certificate from the high school unit. High school training is considered on the basis of 1 year being the equivalent of 1 quarter of college work. However, the waiving of one or more quarters for high school work completed does not obviate the college requirement for six quarters of Military or Air Science or physical education. Qualified freshmen with previous high school ROTC may enroll in second year basic but will not be enrolled for advanced ROTC until they complete lower division work.

### Air Force ROTC

Howard A. Moody, Colonel, Professor of Air Science and Tactics. Assistant Professors of Air Science and Tactics: Gaston M. Hensley, Lt. Colonel; Harry F. Broman, Major; Robert L. Howard, Major; Harry W. Plummer, Major; William G. Giel, Captain; David K. Merrill, 1st Lt.; Kenneth L. Sterne, 1st Lt.; Eldon B. Hooper, 1st Lt.; Robert G. Publicover, CWO.

The Air Force ROTC curriculum was designed to produce commissioned officers in quantities and of qualities sufficient to meet the needs of the United States Air Force in these times of international tensions. Although the need exists for officers in many fields and technical specialties, the greatest need is for pilots and other flying personnel.

The Air Science curriculum is divided into the basic course, covering freshmen and sophomores; and the advanced course, consisting of juniors and seniors. During the advanced phase students will receive \$0.90 per day.

Entering freshmen desiring enrollment in the Air Force will be admitted. It is the desire of the Air Force that the majority of students will eventually apply for flying duty either as pilots or as flying personnel of some type.

### Enrollment

All students enrolled in the basic course must meet the following conditions:

1. Be a citizen of the United States.
2. Be physically qualified.
3. Be a regularly enrolled student at the institution.
4. Student must be between 14 and 23 years of age at time of initial enrollment.
5. No credit will be allowed by the Air Force for High School ROTC.
6. Depending upon the amount of time served, veterans will be given credit for the basic program but cannot enter the advanced program until they are academic juniors.

### Equipment

1. Students will be provided with textbooks and uniforms at no expense to themselves.
2. Each Air Science student will make a \$5.00 deposit with the Registrar to cover damaged or lost equipment.
3. Students who are registered in Air Science will be issued a booklet covering AFROTC regulations, customs and procedures. A copy of this booklet is on file with the deans for ready reference by advisors.

## ARMY

### Basic Courses (MS I and MS II)

11. **Military Science I.** Organization of the Army and ROTC, American Military History, School of the Soldier and Exercise of Command. (1F) **Jacques**

12. **Military Science I.** American Military History, Individual Weapons and Marksmanship. (1W) **Jacques**

13. **Military Science I.** Individual Weapons and Marksmanship, School of the Soldier and Exercise of Command. (1S) **Larsen**

21. **Military Science II.** Map Reading, School of the Soldier and Exercise of Command. (1F) **Larsen**

22. **Military Science II.** Aerial Photograph Reading, Crew Served Weapons and Gunnery. (1W) **Larsen**

23. **Military Science II.** Crew Served Weapons and Gunnery, School of the Soldier and Exercise of Command. (1S) **Cooper**

### Advanced Courses (MS III and MS IV)

131. **Military Science III.** Small Unit Tactics, School of the Soldier and Exercise of Command. (3F) **Lacey**

132. **Military Science III.** Small Unit Tactics. Organization function and mission. Arms and Services. (3W) **Lacey**

133. **Military Science III.** Leadership, Teaching Methods, School of the Soldier and Exercise of Command. (3-S) **Lacey**

141. **Military Science IV.** Operations, School of the Soldier and Exercise of Command. (3F) **Leejer**

**142. Military Science IV.** Operations, Logistics, Military Administration and Personnel Management. (3W) **Leeper**

**143. Military Science IV.** Military Administration, Service Orientation, School of the Soldier and Exercise of Command. (3S) **Leeper**

**150. Military Science Summer Camp.** Six weeks practical training at a regular army post. Attendance at summer camp is required of all advanced military science students. Students normally attend during the summer following completion of Military Science III.

**174. Advanced Military Science Seminar Problems.** Prerequisite: Enrollment in or completion of Advanced Military Science. Credits arranged. **Staff**

**201. Advanced Military Science Seminar Problems.** Prerequisite: Graduate standing. Credits arranged. **Staff**

### AIR SCIENCE COURSES

Two hours drill are required each week during the fall and spring course.

#### AIR SCIENCE I—FIRST YEAR BASIC—AIR FORCE

**11. Air Science.** Introduces student to Air ROTC course, to USAC cadet program and to regulations which govern cadet. Reason for ROTC program and obligations of service are explained. Major part of quarter is devoted to history of flight beginning with man's earliest attempts to fly. Theory of flight is taught in latter part of quarter. (Drill required) (1F)

**12. Air Science.** Fundamentals of Global Geography. The major geographical regions of the earth, map projections, geography of the world as influenced by the airplane, are first studied. The power of a nation to defend itself and to support a war effort, based on its geographical position and resource strength. Then attention is given to the reasons for war, the solutions mankind has tried, their successes and failures, in attempting to eliminate war. The tensions which build up between nations, their causes and results. The basic structure of the United Nations and various other security organizations is taught in this quarter. (1W)

**13. Air Science.** Historical development, mission, weapons and joint operations of Armed Forces; the place of air power in modern war, the functions and use of aircraft in modern war, and in combination with other branches of the service. The future of military aviation in the United States. (Drill required) (1S)

#### AIR SCIENCE II—SECOND YEAR BASIC—AIR FORCE

**21. Air Science.** Introduction to Elements of Aerial Warfare. Study of targets including definition and types and related intelligence procedures. Study of weapons, including conventional high explosives, atomic, rocket-propulsion, chemical, biological and psychological. (1F)

**22. Air Science.** Study of delivery aircraft dealing with factors governing design and type of delivery aircraft and purpose for which designed. Study of the air base as a platform for the delivery of weapons. (1W)

**23. Air Science.** Study of operations including types of combat air operations such as strategic, theater, air transport, and air defense. This study preceded by background material on United States Air policy. (1S)

#### AIR SCIENCE III—FIRST YEAR ADVANCED—AIR FORCE

**131. Air Science.** Introduction to advanced AFROTC, the functioning of the Air Force during the first 15 hours. The remaining 25 hours of the quarter are (writing, speaking, reading, listening) techniques, and Air Force instructional methods are the content of this course. (3F)

**132. Air Science.** Legal procedures and the military justice system in the Air Force during the first 15 hours. The remaining 25 hours of the quarter are used to present the principles of aerodynamics and aircraft propulsion units. (3W/)

**133. Air Science.** Aerial navigation (including map reading and use of navigational computers), weather prediction and weather map interpretation, and the actual functions of a typical Air Force Base and the functions of the key officers on a base are presented. (3S)

**150. Air Science, Summer Camp.** The Air Force ROTC summer camp consists of four weeks of practical training at an established AF Base. It is conducted by regular Air Force officers and offers the cadet training with latest equipment used by the Air Force.

Unless exempt, the cadet attends the camp the next summer following the signing of his contract. Exemptions are authorized only for students who are required to attend other summer schools or camps, such as Forestry or otherwise. In this case, the student is required to attend Air Force camp the following summer.

Students who volunteer may participate in local and aerial flight while attending ROTC summer camp. (4 Su)

#### AR SCIENCE IV—SECOND YEAR ADVANCED—AIR FORCE

**141. Air Science.** Summer camp critique, principles of leadership and management, authority of command, responsibilities of leadership and problems of leadership and career guidance are taught during this quarter. (3F)

**142. Air Science.** This course covers military aspects of world political geography and geopolitical concept, international politics, structure of politics, structure of political power, world powers and strategic areas, changing patterns of power in world politics, and problems in world security in relation to international power clashes. (3W)

**143. Air Science.** This course covers military aviation, evolution of warfare to include principals of war, modern warfare as carried out by land, naval and air arms. The students are briefed for commissioning service to include active duty assignments and the long range reserve plan. (3S)

#### AIR SCIENCE ADVANCED—SEMINAR

**171, 172, 173. Air Science Seminar.** (Prerequisite: Enrollment in Advanced AFROTC or a graduate of AFROTC.) This course is devoted to study of the duties of an Air Force officer at squadron level. (Credits arranged)

#### JOINT ARMY-AIR FORCE COURSES OR ACTIVITIES

**Sponsor Corps:** A semi-military organization composed of 75 coeds elected to the Corps by popular vote of the Army and Air Force Advanced Cadets. Only freshmen may apply to fill annual vacancies.

**ROTC Band:** A military band under the direction of the College Band Instructor but governed by the policies of the Departments of Military and Air Science. Students selected for the band will enroll for Military or Air Science classroom work but drill only with the band.

**Pershing Rifles:** The National Society of Pershing Rifles was formed "to foster a spirit of friendship and cooperation among men in the Military Department and to maintain a highly efficient drill company." Company "D," 6th Regiment and 6th Regimental Headquarters are both located at USAC. Pershing Rifles has an Army Platoon and an Air Force Flight and is open to any basic or advanced cadet as long as the number does not exceed 60 basics and 7 advanced students.

**Rifle Team:** Established to promote marksmanship among Army and Air Force Cadets. Team competes in several regional and national invitational tournaments.

### ROTC Band Courses

1B, 2B, 3B. ROTC Band. First Year (1F, 1W, 1S)	Staff
4B, 5B, 6B. ROTC Band. Second Year (1F, 1W, 1S)	Staff

### Sponsor Corps Courses

51, 52, 53. Military Science Sponsor Drill. A Drill course for girls elected to CCorps of Sponsors. (1F, 1W, 1S)	Capt. C. F. McCormick
54, 55, 56. Military Science Sponsors Drill. (Sophomore) (1F, 1W, 1S)	Capt. C. F. McCormick
151, 152, 153. Military Science Sponsor Drill. (Junior) (1F, 1W, 1S)	Capt. C. F. McCormick
154, 155, 156. Military Science Sponsor Drill. (Senior) (1F, 1W, 1S)	Capt. C. F. McCormick

### Pershing Rifles

37, 38, 39. Pershing Rifle Drill—Freshmen	Staff
40, 41, 42. Pershing Rifle Drill—Sophomores	Staff
137, 138, 139. Pershing Rifle Drill—Regimental Staff	Staff

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## Agricultural Experiment Station

R. H. WALKER, Director

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, Purnell, 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. Results of this research are published in bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The Agricultural Experiment Station staff numbers approximately 125. Many of them are also members of the teaching faculty of the College. Some of them also divide their time with the Agricultural Extension Service of the College. In addition, several employees of various bureaus of the U. S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

Main offices of the Agricultural Experiment Station, 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 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 College of Southern Utah, at Ephraim, at the U. S. Forest Service Desert Range Station, at the Benmore Experimental Range in Tooele County, and on the ranges in different parts of the state.

The Station also maintains the following experimental farms:

**Dairy Experimental Farm**, including 183 acres of land, barns and a house. The Station maintains an experimental Holstein-Friesian dairy herd of about 60 pure-bred animals. Pasture investigations are conducted here.

**Greenville Farm**, a 36-acre tract, is used for experimental work in plant breeding and other phases of crop production.

**Farmington Field Station** at North Farmington is a 61-acre tract used for experimental work in horticulture and vegetable crops.

**Nephi Farm** is used for experimental work in dry farming and range seeding. This farm has 103 acres.

**Evans Farm**, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, for a study of improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

**Howell Field Station for Horticulture Research**, located in Weber County north of Ogden, is a 71-acre tract used for investigation in fruit production.

**Poultry Experimental Farm**, a new farm in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.

**Turkey Experimental Farm** is a new 33-acre farm east of the Campus used for studies in turkey breeding, nutrition, and disease control.

**Animal Husbandry Farm** north of the campus contains 287 acres of land used for barns and pasture and production of crops for feed.

A summer range area of 2820 acres in the mountains east of Cedar City is used to graze the experimental sheep.

**Benmore area** of 3500 acres of reseeded range pasture is used in cooperation with the U. S. Department of Agriculture for studies in management of range cattle and for research in range management.

The Station also owns farm plots near the College and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these are soil surveys; plant disease surveys; problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of social problems connected with rural living; gathering of snow survey data; problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and, third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.

Major research now in progress includes projects in the departments of Agricultural Economics, Agronomy, Animal Husbandry, Dairy Industry, Poultry Husbandry, Veterinary Science, Botany and Plant Pathology, Bacteriology and Public Health, Chemistry, Forestry, Home Economics, Horticulture, Irrigation and Drainage, Landscape Architecture and Planning, Physics, Range Management, Rural Sociology, Wildlife Management, and Zoology, Entomology, and Physiology.

## Engineering Experiment Station

J. E. CHRISTIANSEN, Director

See "Engineering Experiment Station" under School of Engineering.

## Extension Service

CARL FRISCHKNECHT, Director

Farm income is expressed in terms of cash, good food, comfortable homes, and pleasant surroundings. Farm ownership and close contact with nature develop virtues in farm families that result in the highest type of citizens.

The main objective of the Extension Service is to aid rural people in improving farm income and in developing useful, satisfactory lives. Its programs help people to help themselves. Rural leadership is developed by encouraging groups of people to analyze their own problems. A plan to solve these problems becomes the Extension program of work, jointly determined by Extension Workers and local people.

Extension programs conducted with and for the people usually result in increased production per acre and per animal unit, more efficient marketing, conservation of soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work which gives boys and girls more appreciation for the farm and home and better understanding of national and world affairs.

The Extension Service is one of the three main divisions of the College and the educational arm of the U. S. Department of Agriculture. Its agricultural and home demonstration agents serve in every county. Cooperating with the agents is a state staff of specialists in agricultural economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, cattle marketing, 4-H Club work, clothing consumer education, education, dairy manufacturing, entomology, home furnishings, home management, horticulture, irrigation, marketing, nutrition, poultry, recreation, rural sociology, and soil conservation. These specialists work out from the College in all portions of the state.

To help train rural leaders, the Extension Service conducts free, non-credit short courses in various agricultural and home economics subjects at the College and at other locations throughout the state.

The Smith-Lever Act of 1914, which established the Extension Service as a unit of each Land-Grant college, specified that the job of Extension was "to give instruction and practical demonstrations to rural people and to the industrial classes to the end that rural life and welfare would be improved."

The ultimate objective towards which Extension work is directed is more fruitful lives and better living for all people in the state.

Extension is a two-way organization. It takes (1) the findings of research to the people of the state and, (2) it takes the problems affecting the welfare of the people back to the research agencies for solution.

## EXTENSION CLASSES, HOME STUDY

L. G. NOBLE, Supervisor

The Division of Extension Classwork and Home Study is fully accredited by the National University Extension Association.

**Extension Classes.** Extension Classes are offered in many subjects. In-service helps to teachers are available in every department, including classes for the renewal of teaching certificates. Classes are available in vocational subjects and for special-study groups.

**Home Study.** 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 should be at least 19 years of age, or must submit 15 units of high school work, or must be graduates of a high school for admission to Correspondence study courses of college grade. One-fourth of the credits necessary for a degree (45) 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, Geology, 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 FOR EXTENSION CLASS WORK FOR CREDIT

### 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 DIVISION OF CLASS WORK

All credit obtained through the Division of Extension Classwork is classified as off-campus credit and meets all requirements for graduation except the "15 hours of on-campus" rule.

Courses carrying extension credits should not exceed 120-minute periods.

Extension classes for graduate students are not given without special permission of the Graduate School.

**Credit for Travel.** Credit will be allowed for travel where previous arrangements have been made with the department of Extension class work. The maximum to be allowed shall not exceed one quarter hour of credit per week for the duration of the course. For further information, contact the department of extension classes.

### III. HOME STUDY COURSES FOR CREDIT

All home study courses must include a final examination.

Students registered for home study must count this study as part of their total load in case of registration for residence work at the College. If the home study or the residence registration exceeds the maximum amount permitted by the Institution, then the student must obtain the permission of the Attendance and Scholarship Committee to carry this excess load.

Each school of the College, subject to faculty approval, shall determine the nature and the amount of home study credit accepted for admission and toward graduation. In no case shall more than 25 percent of the total number of credit hours accepted for graduation be home study credit.

(For other regulations concerning Extension credits, see section on "Graduation" in introduction of this catalog.)

## EVENING SCHOOL PROGRAM

C. D. McBRIDE, Supervisor

The Evening School program is a varied program of both general education and practical training for adults in all walks of life.

### Objectives

1. To provide evening classes for busy people who cannot attend regular day school.
2. To provide practical training in the various occupational fields for people who need to prepare for jobs, or who need further training in their present field of work.
3. To provide classes in general and cultural education for general self-improvement.
4. To provide classes in related instruction for apprentices and other learners.
5. To provide opportunity for people seeking a college degree to take evening classes for college credit without having to discontinue their regular work to go to school.
6. To provide classes in special-interest fields for people interested in a special field of work.

### The Program

Classes in the Evening School are offered by most of the many departments in the various schools of the college. They are taught by the regular college professors and by specialists in the field.

Many of the classes carry college credit which can be earned by meeting the standard requirements for credit.

Other classes are for training purposes and not academic credit. These carry "T" credit, or training credit, which prepares for a job but does not lead toward a degree.

Evening School is held on four evenings a week, Monday, Tuesday, Wednesday and Thursday from 7 to 10 p.m.

Specific classes are scheduled for two evenings a week, some on Monday and Wednesday, and others on Tuesday and Thursday. This makes it possible for a person to attend Evening School two or four evenings a week as they may choose.

Classes are held on a clock hour schedule. Classroom classes are an hour and a half, and laboratory or shop classes are three hours in length.

Special courses are provided for those who desire to specialize quickly in certain occupational fields.

### Admission

Evening School is open to all adults who can profit by it, regardless of previous education.

Students who intend to work for college credit toward a degree are required to meet the college entrance requirements and maintain acceptable scholastic standards in their work.

Veterans may enter the Evening School under the G. I. Bill

### The School Year

Evening School is held during all the four quarters of the school year. Each quarter covers from ten to twelve weeks.

### Registration

Registration for Evening School is done through the Evening School office located in the Mechanic Arts building.

Students may register during the two weeks prior to the opening of each quarter, or on the special registration day and evening set at the beginning of each quarter.

### Fees

There are two fee schedules. One is for students who desire college credit. The other is for people who do not desire college credit but are interested in taking a class or two for "T" credit, or training for a job.

#### 1. The College Credit fee.

The registration fee for college credit is \$10.00 for the school year or for the summer quarter which is separate from the rest of the school year.

After paying the registration fee a student may register for classes by paying a class fee for each class. The minimum class fee is \$7.50 per quarter and the maximum is \$10.00. The class fee is based on the length of the class period, and not on the credit.

#### 2. The "T" credit, or training credit fee ranges from \$10.00 to \$20.00 per class, including laboratory fee.

A person may register for a class for "T" credit by paying only the class fee, without having to pay the registration fee of \$10.00.

## Summer School

JOHN C. CARLISLE, Dean

For more than 30 years the College has conducted Summer School. Since 1924, the offering has been materially enlarged and enriched. The purpose of this large educational undertaking is to bring to Logan a number of the leading educators of the nation, and build, in the Intermountain West, a summer school of wide influence.

A full quarter of work is offered, divided into two sessions, the first of six weeks and the second, five weeks.

During the Summer School, all departments of the College offer courses; the program is arranged to meet the special needs of summer students. Courses offered in Education, Psychology, and related departments make it possible for students to meet all requirements for Utah certification. This curriculum also meets requirements for certification in most of the surrounding states.

In past years the majority of summer students have been teachers and admin-



istrators in secondary and elementary schools. At present an increasing number of regular students is continuing through the summer. High school graduates are also entering the college immediately rather than postponing entrance until Fall Quarter. Former military personnel who are receiving government aid are especially interested in a regular summer program inasmuch as nearly all of them wish to complete their education as quickly as possible. The summer curriculum is arranged to meet this trend. Consequently, practically all departments are offering much of their regular program in the summer Quarter.

Numerous lectures, lyceum numbers in music and drama, and other recreational opportunities are regularly scheduled as part of the summer school offering.

### GRADUATE CREDIT

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to obtain this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved by the time of registration.

The Summer School catalog containing detailed announcements of courses is issued annually in March and is available upon request.

## COLLEGE OF SOUTHERN UTAH

Daryl Chase, Director

College of Southern Utah, founded in 1897, was first called the Branch Normal School of the University of Utah. With the growing need in southern Utah for agricultural development, a change of administration at the parent institution was effected in 1913 and the school then became a branch of Utah State Agricultural College. The branch was authorized under supervision of the Board of Trustees to offer such courses as are "permitted by law to be given in the Utah State Agricultural College." Through new offerings in Economics Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education, young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all CSU courses parallel those of the parent institution.

Ten men have served as heads of the branch since its founding. The first four were known as principals and held office as follows while the school was a part of the University of Utah: Milton Bennion 1897-1900; J. Reuben Clark 1900-1901; Nathan T. Porter 1901-1904; George W. Decker 1904-1913. The remaining five men have been titled Directors since the institution became a branch of Utah State Agricultural College. They are Roy F. Homer 1913-1921; P. V. Cardon 1921-1922; J. Howard Maughan 1922-1929; Henry Oberhansley 1929-1945; H. Wayne Driggs, 1945-1951. Dr. Daryl Chase was named Director in June 1951.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Upper Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

In 1948-49 courses for the training of elementary teachers to the Bachelor's Degree were authorized by the Board of Trustees.

The first regular summer school of the College was held in 1949.

In 1953 the Board of Trustees authorized that the name of the branch be changed from Branch Agricultural College to College of Southern Utah.

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



# *List of Graduates, 1953*

## TWO-YEAR CERTIFICATES

### Agriculture

Dupleich, Luis Gonzala

Naegeli, Donald Gordon

### Carpentry

Eves, Donald J.

### Machine Tool Technology

Winward, Rene F.

## SCHOOL OF AGRICULTURE

### BACHELOR OF SCIENCE DEGREE IN AGRICULTURE

Abdulkadir, Yosif B.  
 Al-azzawi, Ismail I.  
 Al-dakily, Ghany Hassan  
 Alkahlisi, Ibrahim J.  
 Allen, Nard V.  
 Allen, Seth S.  
 Alsalihi, Kamal Khidher  
 Andersen, Lyle P.  
 Anderson, Dell B.  
 Argyle, LaMar  
 Ashcroft, Gaylen Lamb  
 Ashcroft, Gordon B.  
 Axelgard, Wiggo F.  
 Bagley, Maven T.  
 Bailey, Joseph Astle  
 Barker, LeRoy N.  
 Barton, Dean Preston  
 Bateman, Theodore W.  
 Baxter, Louis Maughan  
 Beatty, Robert D.  
 Bendixen, Leo Embro  
 Bentley, LaVer Walser  
 Berrett, Mark Richard  
 Berry, Vernon Glenn  
 Boss, Jay C.  
 Bown, Cecil Elton  
 Bowns, Raymond W.  
 Butler, D. Gene  
 Byram, Robert Jr.  
 Callahan, Joseph M.  
 Carmack, Don  
 Carver, Royal Thair  
 Christensen, David C.  
 Christoffersen, Grant R.  
 Curtis, George J.  
 Davis, Donald Ray  
 Davis, William Hatch  
 Dennis Jr., Wallace H.  
 Dewey, Wade G.  
 Dixon, Ken  
 Dorius, Lowell Clyde  
 Duke, John Garfield

Farnworth, Dwight P.  
 Fellows, Kay Vard  
 Fife, Maryln Lee  
 Firestone, Walter G.  
 Foote, Wilford Darrell  
 Foster, Ronald Brown  
 Frew, Monte Lester  
 Fullmer, Brian H.  
 Funk, Charles Dennis  
 Ghezelbash, Abbas  
 Glenn, Eldon L.  
 Hale, Verle Quinn  
 Hansen, James Edward  
 Hanson, LeMar Olyn  
 Harris, Alan LeRoy  
 Hart, Glen H.  
 Hartmann, Ernest C.  
 Haycock, Van Martin  
 Hebel, Fred Francis  
 Holmgren, Warren Gordon  
 Hoover, Daniel Phillip  
 Horner, Don Nile  
 Howell, Norman LeRoy  
 Hurst, J. S.  
 Hyde, Arlo Gale  
 Jaddoa, Mohammed Amin  
 James, Sydney Carter  
 Jenkins, Howard J.  
 Johnson, Hyrum G.  
 Jones, Lawrence P.  
 Kadhim, Abdul Hasan  
 Kidman, Clyde Watkins  
 Kilburn, Dale Golden  
 Lemon, Max H.  
 Lessley, Romie Floyd  
 Lloyd, Howard  
 Mansour, Aziz  
 McCoy, John R.  
 McGuire, Charles Mark  
 Mickelsen, Ross  
 Miner, Bert Dean  
 Morris, Harold D.

Motamedi, Nasser  
 Mounir, Wahhab Razzak  
 Neville, Donald  
 Nilson, Kay M.  
 Nord, Daryl J.  
 O'Brien, James Edward  
 Olsen, Dale H.  
 Owens, Grant Shumway  
 Park, Duwane Marvin  
 Parkinson, Ralph S.  
 Peacock, Perry Dell  
 Persons, Melvin Alan  
 Peterson, Lyle  
 Petterborg, Ray P.  
 Phillips, Loren Jay  
 Plowman, Ronald Dean  
 Porter, Lynn Keith  
 Rasmusson, Donald C.  
 Reese, Charles Erle  
 Rehrey, Thomas J., Jr.  
 Richards, Harold J.  
 Richards, Robert Alma  
 Richardson, Gary Haight  
 Risenmay, Jay  
 Rosequist, Dan Ray  
 Salmon, Raphael  
 Searle, Merwyn  
 Shields, Wayne Ross  
 Simis, Donald L.

Simmons, U. Dean  
 Smith, Robert Russell  
 Staheli, Donald L.  
 Stanley, Verl Ray  
 Steinitz, John William  
 Stephens, Allen I.  
 Stephens, Roger LeRoy  
 Stephenson, Blaine H.  
 Stock, Boyd L.  
 Tanner, James Russell  
 Tanner, John Woods  
 Teeples, Leland D.  
 Theurer, Jessop Clair  
 Thompson, S. Keith  
 Vance, Howard McCoy  
 Wagner, William Willard  
 Waite, Marvin LaVern  
 Walker, Howard J.  
 Wallace, Donald H.  
 Westwood, Melvin Neil  
 Wheatley, George W.  
 White, Ross Smith  
 Wight, Jerald Ross  
 Wilcoxon, Roy D.  
 Wilson, DeLoy Gwynne  
 Wilson, Wayne Kent  
 Winter, Leslie Ben  
 Wright, Elling L.  
 Ziag, Ibrahim Abdullah

# BACHELOR OF SCIENCE DEGREE IN ARTS AND SCIENCES SCHOOL OF ARTS AND SCIENCES

Affleck, Philip Dawson  
 Badger, George Junior  
 Bailey, Vern D.  
 Baker, Cecil Richard  
 Baker, Drostan Hatch  
 Baldwin, Bart A.  
 Belli, Roy Louis  
 Bingham, Richard C.  
 Bodily, Ned James  
 Brown, Ralph Clyde Jr.  
 Bruce, Avery Crendon, Jr.  
 Buck, Alf Werner  
 Burgener, Owen Robert  
 Butler, Dail J.  
 Caine, Manon  
 Callan, James Mellett  
 Carlson, James Miles  
 Carter, John E.  
 Coburn, Hal J.  
 Coody, Gilbert L.  
 Coray, Carla Rae  
 Coray, Stephen Alder  
 Cunningham, Merle H.  
 Davis, Halbert Dean  
 Fausett, David K.  
 Feinauer, Earl  
 Flammer, Philip Meynard  
 Forsberg, Robert R.

Gaeth, Grant I.  
 Gardner, Bruce Karl  
 Gardner, Morris David  
 Gibbons, Eileen  
 Gourley, Patricia  
 Graham, Delmore Bruce  
 Hansen, Allene  
 Hanson, Wilford J.  
 Haslam, Marlan J.  
 Hawkes, Herbert Frank  
 Hayes, Jr., Parkin Kennan  
 Hays, Joseph Andrew  
 Headlee, Richard Harold  
 Hemsley, Gene D.  
 Hess, Joseph W.  
 Hirschi, Blaine  
 Hirschi, Wayne L.  
 Hooper, Robert L.  
 Hull, Theda  
 Hurd, Dean Wayne  
 Husayni, Husayn A. W.  
 Ingham, Charles Otis  
 Jackson, Robert Miller  
 Jassim, Ali A.  
 Jensen, Patricia JoAnn  
 Jensen, Rodney W.  
 Jensen, Lucy  
 Johnson, Kim Oscar

Johnson, Richard K.  
 Knowles, C. William  
 Larson, Paul Alan  
 Maurer, Glen H.  
 McArthur, Mary Ann  
 Meldrum, Sterling L.  
 Merrill, Osmond Monte  
 Michel, Ruth Maderna  
 Monroe, Laurence K.  
 Nelson, Myrna  
 Nielsen, Clyde C.  
 Nielsen, Ida M.  
 Noble, John Fowler  
 Nuffer, John Frank  
 Parker, Robena  
 Patterson, Clarice C.  
 Peterson, Stanley C.  
 Phillips, Connie Jean  
 Potter, Robert Francis  
 Rasmussen, Donald L.  
 Reeder, Grant M.  
 Ricca, Antone H., Jr.  
 Robison, Gerald B.

Rollins, Boyd Carter  
 Rollins, Pauline Jensen  
 Sealy, Ramon Lloyd  
 Simmons, Thomas Lamon  
 Smith, Vernard Coleman  
 Spackman, Rex Call  
 Stanger, Paula F.  
 Steinitz, Leta Bailey  
 Thomas, Lindsey Kay  
 Thurman, Marie Anton  
 Tillett, Stephen S.  
 Turek, Edward H.  
 Tuttle, Susan A.  
 Van Orden, Naola  
 Warr, Newell Edwin  
 Wayman, John Allen  
 White, Leon Howard  
 Williams, Verna M.  
 Willie, Ralph Grant  
 Worlton, William Jack  
 Wright, Dwayne P.  
 Yeates, Ivaloo Jean P.

# SCHOOL OF COMMERCE BACHELOR OF SCIENCE DEGREE IN COMMERCE

Adams, John A.  
 Ahlmer, Dean H.  
 Allen, William H.  
 Andersen, Dee Floyd  
 Andersen, Jay C.  
 Anderson, Keith H.  
 Barker, David P.  
 Bedke, Ray C.  
 Berg, Carl Rueben  
 Bertoldo, Fred Joseph  
 Bickmore, Danford C.  
 Bickmore, John J.  
 Blackham, Max M.  
 Bradshaw, Reed Bevan  
 Budge, Scott Gibbs  
 Caldwell, John B.  
 Caraher, Paul Thomas  
 Cardon, Thomas Bartlie  
 Casini, Anthony  
 Chadwick, Ralph Owen  
 Condie, Frank Alma  
 Condie, George Richard  
 Daines, David  
 Daines, Robert William  
 Dean, Robert J.  
 Done, Nathan Kay  
 Fairbourn, Darwin C.  
 Felix, Joseph Carl  
 Frank, Wayne Travis  
 Fretwell, Kenyon B.  
 George, Doyle D.  
 Green, Justin B.  
 Griffin, Dewey Lynn  
 Gustaveson, Melburn

Haight, Charles C., Jr.  
 Hale, Dee A.  
 Hale, Jack Wesley  
 Hales, Heber Lee, Jr.  
 Hamblin, Gilbert Barker  
 Hansen, Gerald Edwin  
 Harris, Burton H.  
 Harris, Gary  
 Haskins, Joan Horseley  
 Henrie, Irvn Lund, Jr.  
 Hensley, Gaston Means  
 Hill, Cal Edsel  
 Hirschi, Maun G.  
 Hodges, Cleon Alden  
 Howell, George Gary  
 Hubbard, Deon W.  
 Hubbard, LeGrande D.  
 Huntington, Robert Glen  
 James, D'Arvil  
 Johnson, Carl G.  
 Jones, Victor Dee  
 Keller, Claude D.  
 Kelly, James Patrick  
 Kenney, Karl Benjamin  
 Kubach, Richard Joel  
 LaClair, Edward B.  
 Larsen, Theodore B.  
 Lawrence, Charles E., Jr.  
 McClure, William Eugene  
 Merrill, A. Richard  
 Merrill, Wendell W., Jr.  
 Michaelsen, Robert C.  
 Mickelson, Reed L.  
 Milrot, John Mathew

Mitton, George L.  
 Montrose, John L., Jr.  
 Moore, Charles Champ  
 Moss, Harold J.  
 Nash, William I.  
 Nelson, Carl Gibbs  
 Nelson, Carl Jay  
 Nielsen, Milton S.  
 Nielson, Sterling Yates  
 Olsen, Roger Lewis  
 Peters, Perry E.  
 Petersen, Kent J.  
 Pugmire, Paul Rich  
 Ramiz, Salmon M.  
 Rasmussen, Clair Rulon  
 Razzaghamanesh, A.  
 Reese, Bonnie Jean  
 Ripplinger, Paul G.  
 Romeieh, Ahmed Michael  
 Samiy, Mozaffar M.  
 Schrader, Marvin Eugene  
 Shaw, Dale C.

Simmons, Ted Duane  
 Skanchy, Robert Kelly  
 Smith, Clifford Wayne  
 Southwick, Richard Glen  
 Steele, Martin J.  
 Steffensen, Dee Marion  
 Stevens, Curtis Hawley  
 Stewart, Theodore Lynn  
 Stohl, Marilyn  
 Taylor, William Peter  
 Wayment, Sherman Arnold  
 Whatcott, Darold Irvin  
 Wilson, George Hill  
 Wise, Lynn J.  
 Wise, Wallace Keith  
 Wood, William Dean  
 Worley, Anna Maria  
 Yeates, Clyde K.  
 Yeates, J. Owen  
 Yeates, Richard Lynn  
 Yost, Thad O.  
 Zollinger, Lincoln J.

#### SCHOOL OF EDUCATION BACHELOR OF SCIENCE DEGREE IN EDUCATION

Adams, Rebecca  
 Allen, LaRue  
 Allen, LuJeanne  
 Anderson, Enid Reid  
 Anderson, Jeannine  
 Anderson, Mary Collings  
 Anderson, Rayma S.  
 Anderson, Roma Thatcher  
 Anderson, Vilate F.  
 Angotti, John B.  
 Atkinson, Darrell D.  
 Baldwin, Roland Alphis  
 Ball, Clyde E.  
 Ballif, Yvonne Marian  
 Barker, Leone  
 Barrett, Gwynn William  
 Barton, Gladys W.  
 Bell, Asael E.  
 Berntson, Julia Evans  
 Blackburn, Chrystal  
 Blackham, Craig B.  
 Blau, Maurice F.  
 Blazzard, James T.  
 Boden, Leo W.  
 Boothe, Ray Merrill  
 Boulter, Richard K.  
 Bowthorpe, Peirce H.  
 Brown, Patricia Nielsen  
 Browning, Carma Phyllis  
 Bruce, Verna  
 Bunker, Kent Edward  
 Bush, John W.  
 Butler, Phebe Jensen  
 Buxton, Susie Henrie  
 Calderwood, JoAnn

Call, Harold R.  
 Campbell, Clista C.  
 Campbell, Rulon C.  
 Carter, Alvin Ray  
 Chappell, W. LaVon  
 Chappell, Sperry  
 Chournos, Joyce Todd  
 Christensen, Elvira O.  
 Christensen, Jerry M.  
 Christensen, Wesley  
 Clark, Florence R.  
 Clark, Jack Whitman  
 Cole, Marjorie Tanner  
 Condie, William Melvin  
 Conley, Bertha Preston  
 Corn, B. Dean  
 Coster, Rodney Thomas  
 Cragun, Jack Leon  
 Crook, Esther M.  
 Crook, Rosella  
 Crossgrove, H. Sue  
 Cummings, Donald George  
 Cutler, Elvin J.  
 Dalton, Antoine A.  
 Davis, Floyd Glenn  
 Day, Anna J.  
 DeAngeles, LaVae  
 Deschamps, Marilyn E.  
 Dinan, Paul John  
 Downey, Carolyn Ruth  
 Ellertson, John W.  
 Ellis, Marilyn Peterson  
 Erickson, Eldon R.  
 Erickson, Grace  
 Erickson, Maurine E.

Esplin, Claire  
Everton, Lois Hale  
Farmer, Darrell E.  
Flenniken, D. Barry  
Fletcher, Dale T.  
Fletcher, Margaret  
Floyd, Virginia Payne  
Fluckiger, Leonora S.  
Frederickson, Lucille A.  
Frischknecht, Clair E.  
Funk, Donna Buttars  
Furgis, Melia  
Galbraith, Douglas P., Jr.  
Gardner, Clark Roscoe  
Gardner, Dale Lloyd  
Gardner, Janice Squires  
Gardner, Mary Estella  
Gardner, Nada Joy  
Garn, Lolita Hodges  
Garner, Hal E.  
Garner, Miriam  
Gates, Carole Joy  
Gates, Virginia S.  
Goodey, Darwin J.  
Green, Verla Meldrum  
Grunig, Max Oscar  
Hansen, Betty Jean  
Hansen, Gaylen Capener  
Harris, James Mack  
Harvey, Ima W.  
Hatch, Oleen N.  
Henrie, Eunice  
Hepworth, Phyllis S.  
Hibi, Satoshi  
Hill, Carl David  
Hirschi, Vera H.  
Howard, Gem T.  
Hunsaker, Thelma Layton  
Irons, Bruce James  
Jacobson, Phyllis C.  
Jarman, Berdean Hales  
Jennings, LaRue  
Jensen, Melva  
Jeppsen, Ardell Nelson  
Johnson, Helen E.  
Jones, Harold Dwane  
Jones, Joy L.  
Jones, Marvin C.  
Keller, Elmo A.  
Kenney, Blair S.  
Kennington, Carol May  
Keolanui, Elie  
Kimber, Norma  
Knight, Roma J.  
Kofoed, Edna H.  
Lay, Donald Coleman  
Leavitt, Lovina C.  
Leavitt, Merettie H.  
Leuthner, Rae C.  
Lewis, Richard Dean  
Lind, Marilyn  
Lisonbee, Norma Condie  
Lowe, LaReen W.  
Ludlow, Katherine J. D.  
Mackelprang, Vida  
Marriott, Yula  
Marshall, John A.  
Martin, Robert Charles  
Mather, Natalie C.  
Maw, Mae I.  
Mayer, Lillieth  
McDonald, Anne  
McGraw, Russell Minor  
Merritt, Bessie Hale  
Metcalf, Mary J.  
Meyer, Vola Claire  
Miller, Ethel Burton  
Milligan, Bonnie Jean  
Moore, Pleasie  
Moser, Grant W.  
Motta, John Richard  
Mower, Wilford Arnold  
Munk, Mary Kunzler  
Munro, Venice Peterson  
Murray, Luella Douglas  
Myers, Kent E.  
Nelson, Lulu W.  
Nelson, Marie Standley  
Nelson, Paul Doyle  
Newby, Quin  
Nielsen, LuDean  
Nilsson, Robert Eldred  
Painter, Loye Lucile  
Painter, Reed Bowman  
Papworth, Harold R.  
Parker, Ray  
Paul, Robert Hobson  
Pendleton, Mary Lou  
Perry, Helen Budge  
Perry, Myrl Dean  
Peterson, Lola Sorenson  
Peterson, Mabel Green  
Phippen, Anna G.  
Quinney, Calvin G.  
Ranzenberger, Elvina J.  
Rawlins, Joyce Dixie  
Reese, Dale L.  
Richardson, Edgar Clyde  
Riley, Richard D.  
Rindlisbacher, Dale M.  
Robinson, Joyce Budge  
Rodenhiser, Carl L.  
Romberger, Norman  
Rose, Carmen  
Salvesen, Lyman Earl  
Sargent, Mildred I.  
Schoonover, Ila Mae  
Schow, Helen Bailey  
Sherratt, Jerry Robert  
Skidmore, Lenora Bowen  
Slater, Carol  
Smith, Esther H.  
Smith, Georgia Ann  
Smith, Joyce Hansen

Smith, Reeta Ann  
 Smith, Robert William  
 Smith, Roland Burton  
 Smith, Ruby  
 Sorensen, Eva L.  
 Sorensen, George Cole  
 Springman, Robert W.  
 Steffensen, Margaret C.  
 Stevens, Joyce C.  
 Stewart, Ina Spaulding  
 Stott, Mary Alice  
 Sutton, Margaret Ruth  
 Taylor, Fern Olsen  
 Taylor, Phyllis Webb  
 Thompson, Afton B.  
 Thompson, Beverly  
 Thompson, Don James  
 Thurgood, Nora B.  
 Thurston, LuDeane  
 Tippetts, Florence  
 Tobler, Fenton

Toone, Velma  
 Topham, Zona P.  
 Torsak, Rhoda E.  
 Tripp, Maxine R.  
 Tucker, June L. Cliften  
 Tuft, Don Leonard  
 Turley, Maurine J.  
 Turner, Vilate Erickson  
 Vander Heide, Pearl M.  
 Waite, Jean Hyde  
 Watson, Effie Lowe  
 Whitney, Jean W.  
 Wilcox, Norma  
 Wilkes, Ila W.  
 Williamson, Dale F.  
 Winterbottom, Ethel R.  
 Wiser, Lorin K.  
 Yonk, Betty Lou  
 Younker, Mildred S.  
 Zahller, Harvey Verner

#### SCHOOL OF ENGINEERING AND TECHNOLOGY BACHELOR OF SCIENCE DEGREE IN AGRICULTURAL ENGINEERING

Baxter, Calvin J.  
 Saghri, Khosro

Steed, Glen Lyle

#### BACHELOR OF SCIENCE DEGREE IN CIVIL ENGINEERING

Abdush-Shafi, Abdul K.  
 Barnes, Edwin J.  
 Bhatti, Aziz Mahmood  
 Bolingbroke, Cleve S.  
 Bradley, Glenn Clifton  
 Christiansen, Jerald N.  
 Clyde, Richard Bruce  
 Coburn, Don B.  
 Durrant, Herald Boyd  
 Fonnesbeck, Carl Irwin  
 Frederiksen, Harald D.  
 Gardner, David B.  
 Gibson, Ralph Waldo  
 Glover, Harvey  
 Harding, Robert D.  
 Iwertz, Carl E.  
 Johnson, Kenneth Andrew  
 Knowlton, G. Edward  
 McClurg, Robert Dean  
 Millard, Robert H.

Milligan, Rex Vincent  
 Ogden, Dale H.  
 Otis, Donald Wayne  
 Patil, Uttamrao Ananirao  
 Rawdan, Rawdan Jafar  
 Richardson, Howard H.  
 Rojas, Ernest Hugo  
 Rupani, Novinchandra L.  
 Saghri, Khosro  
 Sandberg, John C.  
 Shinkle, Ivan Elmore  
 Skidmore, Robert D.  
 Steinvoot, Johannes  
 Suganski, Chester S.  
 Terebenetz, Stephen J.  
 Tibshirani, Sami N.  
 Turley, Robert S., Jr.  
 Woodworth, Harley R.  
 Yumlu, Mutahhar A.

#### BACHELOR OF SCIENCE DEGREE IN ELECTRICAL ENGINEERING

Bauer, Louis Harold  
 Burgess, Eldon W.  
 Collier, George Henry  
 Crossen, Manford W.  
 Johnson, Gordon  
 Jones, Laural Jonquin  
 Laird, Alvin George  
 LaRocque, Martin Dean

Madsen, Renn D.  
 McLaughlin, John Willard  
 Motamedi, Mansoor  
 Prsbrey, Dilworth  
 Seamons, Darwin L.  
 Seely, Elvin Anthony  
 Smith, Laurence Duke  
 Thompson, Vernal Wynn



## BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL EDUCATION

Brough, LaGrande R.  
Brown, Grant E.  
Cloward, T. J.  
Corra, Frederick J., Jr.  
Dougherty, Andrew M.  
Galloway, George  
Gardner, Marlowe D.  
Gaspar, Jack  
Gibson, Wallace L.  
Gillespie, Wallace D.  
Goodey, Oris Devoe  
Green, Lawrence Leslie

Jensen, Robert E.  
Johnson, George R.  
Jorgensen, Ray Ellis  
Kenyon, Douglas Paul  
McGregor, James Donald  
Potts, Albert J.  
Reed, George Arthur  
Richins, Robert Harold  
Snyder, Paul  
Wall, John Ray  
Weyland, Bruce M.

## BACHELOR OF SCIENCE DEGREE IN INDUSTRIAL TECHNOLOGY

Ashcraft, Glenn B.  
Baird, Joseph Kieth  
Ballard, Denzil G.  
Bohner, Loren Frank  
Brew, Robert Francis  
Child, Derral M.  
Christensen, Dee Ross  
Clement, Alma Levor  
Colton, Lawrence Boyd  
Cook, Jack Norwin  
Doshi, Prabhat G.  
Goodwin, Dale Edward  
Hansen, John Roland  
Hepworth, Neil N.  
Hill, Allen Albert  
Hoeft, Donald Shaw  
Hull, Cherill  
Jensen, F. Ross

Jensen, Nolan Mac  
Krause, Waldemar W.  
Kunzler, Richard J.  
McGuire, Fay W.  
Miller, Calvin Gene  
Mortensen, Robert J.  
Nelson, Rex Kermit  
Norton, McLaine  
Orton, William  
Parry, William Thomas  
Paxman, James Carter  
Pearson, Donald O.  
Perkins, Doyle D.  
Thomas, Gordon Charles  
Topuz, Cemil  
Ware, Rue Paul  
Wilcox, Hyrum Woodruff  
Wright, Theodore K.

## SCHOOL OF FOREST, RANGE AND WILDLIFE MANAGEMENT

## BACHELOR OF SCIENCE DEGREE IN FOREST MANAGEMENT

Brann, Morton Fletcher  
Budge, Charles A.  
Cochrane, James S.  
Gara, Robert Imre  
Giertsen, Owen Nordahl

Heninger, Richard D.  
McElroy, Harold  
Roll, Theodore August  
Skelly, Joseph Stephen  
Smith, Walter E.

## BACHELOR OF SCIENCE DEGREE IN RANGE MANAGEMENT

Dimick, Edwin Glen  
Heald, Lawrence Wesley  
Jenson, Jens Crosby  
Mitchel, James Leroy

Rice, Carl Morton  
Sedgley, James F.  
Smith, Lenard Dale  
Whitlock, Clair M.

## BACHELOR OF SCIENCE DEGREE IN WILDLIF MANAGEMENT

Allen, Jack Pickford  
Gebhards, Stacy V.  
Gorman, James Allen  
Hibbert, Delvan Dee  
King, Donald J.  
McKinnie, Harold A.

Norell, Richard C.  
Parker, Richard Alan  
Shelly, James Norbert  
Smith, Donald Allen  
Thorsted, Glen J.

SCHOOL OF HOME ECONOMICS  
BACHELOR OF SCIENCE DEGREE IN HOME ECONOMICS

Arnell, Nada Lanore	Morris, Shirley Ann
Bird, Marilyn	Mortensen, LuJean
Bodily, Beryl	Munk, Joan
Burton, Janice	Nelson, Ruth Eloise
Chambers, Daphne Faye	Nielsen, Marian
Christensen, Jean	Nielsen, Melva
Eggen, Neeltje Lydia	Orton, Hilma
Felsted, Helen Nanette	Perkins, Elaine C.
Griffeth, Shirlene	Pixton, Eunice Hunt
Harper, Ella Jean	Redd, Vera Lee
Heyrend, Anna Marie	Robson, Vira Beth
Hooker, Joyce Ludene	Schick, Ruth
Jackson, Shirley	Simmons, Ruth Ann
Johnsen, Gaynell	Sorensen, Carmae
Jones, Clara Ramsay	Storey, Lorraine
Jorgensen, Noreen	Tweedie, Mary Helen
Kennard, Margaret	Welti, Alice Elaine
Kunz, J. Jeanette	Windchief, Emily Sweeney
Larson, Lucy C.	Woodhouse, LaRue

MASTER OF SCIENCE DEGREE

- EDWIN B. ABBOTT, Range Management—"Effect of Season, Spacing and Intensity of Seeding on Emergence and Survival of Four Wheatgrass species in Central Utah."
- AHMAD A. AHMADI, Vegetable Crops—"B" Plan Seminar Reports.
- HAZIM AHMED AL-JIBOURI, Agronomy—"Inheritance of Ten Characters In Barley Crosses."
- DONALD ANDRIANO, Fisheries Management—"Analysis of Fishing Pressure and Harvest on Portneuf River, Idaho."
- BASHER ARIDI, Social Science—"Attitude of the Asiatic Students Attending the Utah State Agricultural College Toward the United States, Logan, and the U.S.A.C."
- CHRIS T. AXELGARD, Physical Education—"Organization and Control of Athletic Administration in Region Seven of the National Collegiate Athletic Association."
- BARBARA SWENSEN BAER, Psychology—"Interest Patterns for Four Occupations: Kuder Preference Record."
- JAY MERRILL BAGLEY, Irrigation and Drainage Engineering—"A Study of the Major Factors Effecting Intake Rates Under Furrow Irrigation."
- VERN R. BEECHER, Industrial Education—"A Survey and Evaluation of Driver Education in Utah Secondary Schools."
- ROBERT KEITH BERNTSON, Psychology—"A Study of Adolescent Development as Reflected by the Thematic Apperception Test."
- RULON W. BUCK, Poultry Management—"Identification of Superior Breeds and Strains of Chickens for Production of Poultry Meat."
- GLEN H. CALDER, Civil Engineering—"Consumptive Use of Water by Major Farm Crops in the Milford District of Utah."
- LAWRENCE GEORGE CANNELL, Chemistry—"The Preparation of Carboethoxy Methyl Esters of Substituted Aromatic Acids."
- WILLIAM NORMAN CAPNER, Agricultural Economics—"Affect of Specified Factors on 1951 Farm Prices of Utah Peaches."
- TOD V. CARLINI, Physical Education—"A Study of the Campus Recreation at Utah State Agricultural College."

- ILINDEN F. CASTLE, Education—"A Survey of Selected Predictive Devices Used in Studying Delinquency."
- LUIGI CAVAZZA, Agronomy—"The Influence of Temperature Gradients on Soil Moisture Flow."
- IDAN C. CAVANAUGH, Bacteriology—"B" Plan Seminar Reports.
- RAWSON D. CHILD, Industrial Education—"A Survey to Determine if the Institutions Teaching Welding are Meeting the Desires of Industry."
- WENDELL BLACKBURN CHENEY, English—"B" Plan Seminar Reports.
- RUTH VICKERS CLAYTON, Clothing, Textiles, and Related Arts—"Designs with Cache Valley Motifs."
- EARL BUDGE CRAGUN, Educational Administration—"A Type Study of Community Backgrounds for Education of Pleasant View, Weber County, Utah."
- BILLIE E. DAHL, Range Management—"The Digestible Nutrients and Metabolizable Energy Found in Winter Range Plants."
- LYNN HERMAN DAVIS, Agricultural Economics—"Cost and Efficiency of Producing Canning Peas in Cache and Box Elder Counties, Utah."
- WILLIAM MACLEAN DICKSON, Political Science—"Civil-Military Relationships in the Relief of General Douglas MacArthur."
- WILLIAM A. EICHELBAUGH, English—"Thespian, and Other Poems."
- RAY C. ENGLESTEAD, Physical Education—"A Study to Determine Present Policies and Practices Regarding Compensation for Supervision of Activities Over and Above a Normal Teaching Load in the Secondary Schools of Utah."
- REZA ESFANDIARI, Political Science—"The North Atlantic Treaty Organization and the United States Senate."
- ROBERT LEE EZELL, Geology—"Geology of the Rendezvous Peak Areas, Cache and Box Elder Counties, Utah."
- GORDON HANS FLAMMER, Civil Engineering—"Drainage of the Logan-Hyde Park-Benson Area, Utah."
- RUSSELL S. FRASER, Bacteriology and Public Health—"A Comparison of Methods for Differentiating Sources of Fecal Pollution of Water."
- LEE MARION FREDERICK, Political Science—"The Foreign Policy of Senator Arthur H. Vandenberg."
- PAULINE FULLER, Physical Education—"A Study of Women's Participation and the Administration of Intramural Sports in the Junior Colleges of Utah."
- ROBERT W. FULLER, Wildlife Management—"Studies in the Life History and Ecology of the American Pintail (*Anas acuta tzitzihoa Vieillot*) in Utah."
- GEORGE R. GANUNG, Psychology—"A Study of Scholastic Achievement Related to Personality as Measured by the Minnesota Multiphasic Personality Inventory."
- ALMA L. GARRETT, Physical Education—"A Study of the Graduation Requirements in Military Science and Physical Education for Men in Land-Grant Colleges and Universities."
- ABBAS CHAFFARI, Political Science—"Iran's Position in the Oil Dispute."
- KHALIL A. GHALAYINI, Political Science—"Problems of Point Four Program in the Middle East."
- GRANT P. GRANDY, Educational Administration—"Benefits under Teacher Requirement Systems Compared to Benefits under Social Security as They Apply to the State of Idaho."
- THOMAS I. GUNN, Agricultural Economics—"Cost of Producing Broilers in Utah, 1951-1952."
- ABDUL GHANI JOSEPH HABBAB, Sociology—"Socio-Economic Factors Influencing the Intent of Rural Youth to Migrate From Emery, San Juan, Kane, and Piute Counties of Utah."

- MAHDI HABIB, Bio-chemistry—"Content of Carotent, Alpha Tocopherol (vitamin E) and Phosphorous in Alfalfa Hay Grown in Utah Soils Treated with Different Fertilizers."
- REX J. HADDOCK, History—"A History of Cache Valley, Utah, from the Fur Period to the Year 1869."
- CHARLES WILLIAMS HAILES, Industrial Education—"Industrial Arts in Utah—Its Introduction and Development."
- MARY JANE HANDY, Speech Pathology—"A Monitored Speech-Hearing Method of Testing the Hearing of Very Young Children."
- ERLESE DON HANSEN, Soil Science—"Distribution of Fluorine in Utah County, Utah, Soils and Uptake of Fluorine from Soil by Plants."
- SHERMAN HANSEN, Education—"The Status of the Elementary School Principalship in Utah."
- JAMES MAURICE HARRIS, Psychology—"Guidance in an Elementary School: Needs, Methods, Evaluations."
- JOHN A. HART, Education—"An Evaluation of Pupil Ability to Solve Problems Using Formulae Found in Physics Text Book, Before and After Taking the Course in High School Physics."
- VIRGIL LEE HART, Range Management—"Halogeton and Range Management."
- JACK WILEY HERRING, Poultry Husbandry—"Strain Variation Among Broad Breasted Bronze Turkeys."
- FAUNG GEDDES HOGGE, Education—"A Cooperative Effort in Curriculum Improvement in Jefferson County, Idaho from 1950 to 1952."
- BRUCE HOWARD, Landscape Architecture and Planning—"The Design and Analysis of a State Park."
- GEREN V. HOWELL, Dairy Production—"Mileage per First Service as Affected by Shape of Area and Number of Cows Serviced by a Technician of a Utah Artificial Breeding Association."
- GEORGE H. HUNT, Educational Administration—"Aviation Information in Selected Senior High School Physics Textbooks."
- ROBERT BRUCE IRVING, Fisheries Management—"The Ecology of the Cutthroat Trout, *Salmo clarki* Richardson, in Henry Lake, Idaho."
- FUAD SULAIMAN JABBUR, Agronomy—"B" Plan Seminar Reports.
- LAVERD JOHN, Elementary Education—"The Role of Teacher-Counseling in an Elementary School Guidance Program."
- MYRTLE MARGUERETTE JOHNSON, English—"B" Plan Seminar Reports.
- CHARLES WILLIAM JONES, Soil Science—"The Effect of Fertilizers on the Yield, Carotent Content and Tocopherol Content of Ranger Alfalfa Hay in Utah."
- LYMAN E. KIMBER, Secondary Education—"A Follow-Up Study of Pupils Completing Grades One Through Ten in a Three-Teacher School."
- WALTER KOCHAN, Botany—"The Relationship Between Oxygen Consumption of Excised Roots and Susceptibility to Chlorosis in Several Varieties of Grapes."
- ROBERT E. LEE, Bacteriology—"The Effect of Partial Sterilization of Soil with Ethylene Dibromide upon the Microbial Activities of the Soil."
- WILLARD LYMAN LINDSAY, Soil Science—"The Effect of Bicarbonate Iron and Root Aeration on Lime Induced Chlorosis."
- VERN L. MARBLE, Agronomy—"The Influence of Time and Rate of Application of Urea Spray on the Field and Protein Content of Winter Wheat."
- ROSS J. MCARTHUR, Industrial Education—"A Study of Influential Factors in the Development and Unification of American Standard Screw Threads."
- DAVID MCCOMB, Entomology—"The Use of Trap Trees for the Control of Engelmann Spruce Beetle *Bendocrotonus engelmanni* Hopkins."
- ALASTAIR MCLEAN, Range Management—"The Autecology of *Atriplex nuttallii* S. Wats. In Southwestern Saskatchewan."

- O'LETA P. MOORE, Clothing, Textiles, and Related Arts—"The Demonstration Method Versus the Slide--Lecture Method of Teaching Fitting."
- DEE RICH MORGAN, Dairy Manufacturing—"A Chromatographic Study of the Lower Fatty Acids of Swiss Cheese as a Measure of Quality."
- JUNIUS GLENN MORRILL, Agricultural Education—"A Study of the Present Occupational Status of Former Students of Vocational Agriculture in the High Schools of the South Sanpete District."
- HORATIO WILLIAMS MURDY, Wildlife Management—"Some of the Relationships Between Livestock Grazing and Duck Nesting in the Saltgrass Vegetation Type in Utah."
- EDWARD ALMON NELSON, Animal Husbandry—"Wool Growth of Weanling Lambs Fed Various Levels of Urea Methionine, and Sulfur."
- WAYNE WOODWARD NELSON, Physical Education—"A Study of Interscholastic Boxing in the High Schools of Idaho."
- CLESS L. OLNEY, Physical Education—"Motor Ability as a Predictive Measure of Potential Basketball Ability."
- ARLAND EUGENE OLSON, Physiology—"The Effect of Injected Radioactive Phosphorus on Some Phases of Reproduction in the Albino Rat."
- BOYD KENNETH PACKER, Secondary Education—"An Evaluation of the Teaching of Jesus in Terms of Selected Principles of Education."
- WILLIAM GATEWOOD PARSONS, Wildlife Management—"The Status and Management of the Pheasant Posted Hunting Areas of Utah."
- EDWARD W. PAYNE, Educational Administration—"Relative Curricular Emphasis in Some Utah High Schools During the 1941-1951 Years."
- RICHARD W. PERKINS, Chemistry—"The Reaction of Some Sodium Salts of Fatty Acids and Benzoic Acid with Alpha-Bromobenzyl Cyanide."
- RICHARD H. PETERSEN, Political Science—"A Study of How Events From the End of World War II in 1945 Until the Lisbon Conference in 1952 have brought about the Acceptance by the United States and Its Western Allies of German Rearmament."
- MARIE PETERSON, Education—"Utilization of the Community Resource to Enrich the Elementary Curriculum."
- MISCHA POZNANSKI, Music Education—"Development of Original Violin Method; Explanatory Outline, the Method Itself and Its Principles."
- WARREN W. RASMUSSEN, Agronomy—"The Total Surface of Some Soils as Related to Permeability and Water Retention Characteristics."
- WARD J. RUDERSDORF, Wildlife Management—"The Coactions of Beaver and Moose on a Joint Food Supply in the Buffalo River Meadows and Surrounding Area in Jackson Hole, Wyoming."
- GLEN WILFORD SARGENT, Dairy Manufacturing—"A Comparison of Formulae in the Manufacture of Ice Milk."
- JAMES T. M. SHEN, Animal Husbandry—"The Influence of Sire and Sex Upon Rate of Gain and Body Measurements in Beef Cattle."
- EARL WILLIAM SMITH, Agronomy—"A Linkage Study of Chromosome IV in Barley."
- JAY HAMILTON SMITH, Bacteriology—"The Identification of Four New Actinomycetes."
- HOWARD E. SPENCER, JR., Wildlife Management—"The Cinnamon Teal (*Anas cyanoptera* Vieillot); Its Life History, Ecology, and Management."
- RUTH M. SORENSON, Education—"Long Ago Indian Stories."
- NOLAN RILEY TAYLOR, Educational Administration—"A Public Opinion Survey of Ogden City Schools."
- SIMON T. L. TSANG, Animal Husbandry—"The Effects of Vitamin B. Complex and Antibiotic Feed Supplements in the Rations of Suckling Pigs."

- DAN GILES TURNER, Dairy Manufacturing—"The Influence of Amounts of *Propionibacterium shermanii* on Eye Formation and Flavor of Swiss Cheese."
- ARLAND C. VALCARCE, Entmology—"A Taxonomic and Distributional Study of the Genus *Melanoplus* in Utah."
- JOHN FRANKLIN VALLENTINE, Range Management—"B" Plan Seminar Reports.
- VANCE DEMONT WALKER, JR., Zoology—"Factors Affecting the Establishment and Spread of the Bullfrog *Rana catesbeiana*."
- VAUGHN WASSOM, Educational Administration—"An Evaluation of the Willard School as a Community Centered School."
- FRANKLIN WHITEHOUSE, JR., Educational Administration—"An Analysis of School Drop-Outs at Tooele High School."
- J. WAYNE WHITWORTH, Agronomy—"Viability of Seeds Produced by Annual Weeds and Winter Wheat Treated with Herbicides."
- LYNN R. WILLEY, Industrial Education—"The Growth and Development of the Present Division of Technology at Utah State Agricultural College."

## DOCTOR OF PHILOSOPHY

- CHARLES DOUGLAS STEWART, Irrigation and Drainage Engineering—"Field Measurement of Hydraulic Conductivity of Saturated Soils Below the Water Table."

## IRRIGATION ENGINEER

- JOHN PAUL RILEY, Irrigation and Drainage Engineering—"Drainage of Land Overlying Artesian Aquifer, Logan-Cache Airport."

## HONORARY DOCTOR'S DEGREE

- Harold B. Lee—Doctor of Humanities  
Ella V. Reeder—Doctor of Humanities  
Lyle F. Watts—Doctor of Science



SUMMARY OF ATTENDANCE 1952-53  
Regular School Year 1952-53 (September to June)

	Sub. College		Fresh- men		Sopho- mores		Juniors		Seniors		Graduates		Sub. Total		Total
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	
Agriculture			187	4	137	1	128		167	1	75	1	694	7	701
Arts and Science	2	1	217	131	124	46	79	23	82	21	41	8	545	230	775
Commerce		1	83	106	91	48	97	16	104	7	30	2	405	180	585
Education		1	68	79	47	61	64	62	82	69	55	23	316	295	611
Engineering			268	1	145		145	1	132		40	1	730	3	733
Forestry			57		20		41		41		31		190		190
Home Economics			1	87		46	1	38		44		9	2	224	226
Sub. Totals	2	3	881	408	564	202	555	140	608	142	272	44	2882	939	
TOTALS	5		1289		766		695		750		316		3821		

Male      2882  
Female      939  
-----  
3821

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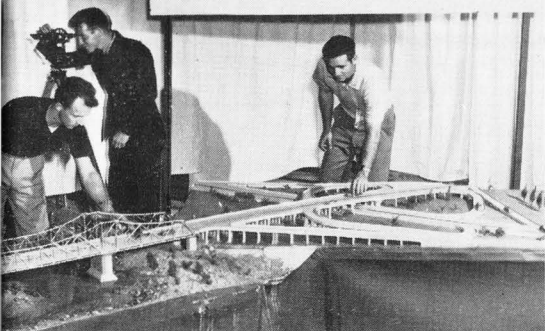
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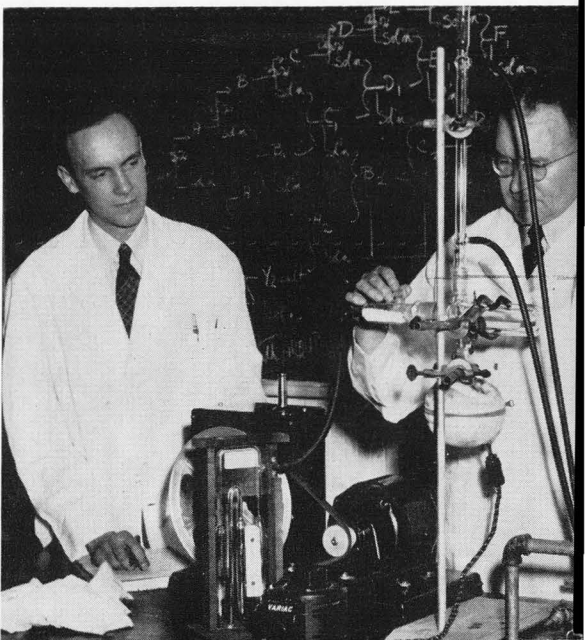


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Utah State is situated on a terrace of long-vanished Lake Bonneville. The College overlooks Logan and Cache Valley to north and west and south, and looks east to the Wasatch Mountains. Near at hand, through that rocky rampart, opens the gateway of Logan Canyon which leads to the high parklands of USAC's forestry camp.

On the Logan campus are some 40 principal buildings ranging from historic "Old Main" with its bell tower, to the splendid new Student Union with its lovely ballroom, dining facilities, game and recreation rooms, and student offices. The Agricultural Science Building is now under construction and will be occupied in 1954-55. A new residence hall will soon be added to the dormitory accommodations of the campus.

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