

1952

## General Catalog 1952

Utah State University

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# Utah State Agricultural College

## CATALOG BULLETIN

Vol. 52

May, 1952, Logan, Utah

No. 5



Utah State agricultural scientists experiment in field and laboratory. USAC experiment farms are located from one end of the state to the other.



Chemist explains Atomic Energy exhibit to Arts and Sciences students. The College provides both general and specialized education of high quality.

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

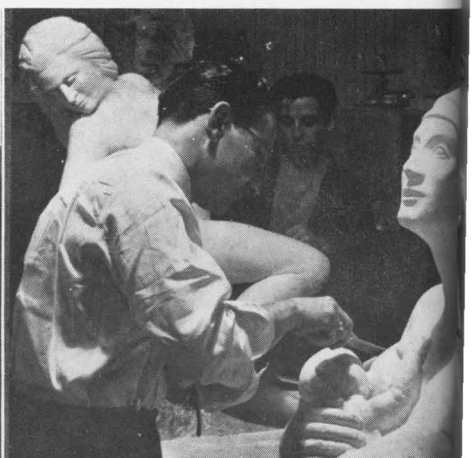
*"... to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."*

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

Commerce students learn practical lessons in business and industry. This School also provides courses in citizenship.



Art and Music are taught at USAC. The School of Education also trains prospective teachers in elementary and high schools.



**UTAH STATE  
AGRICULTURAL COLLEGE  
BULLETIN**

**Catalog Issue  
1952-53**

**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. 52, No. 5, May 1952. 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.**

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1952  
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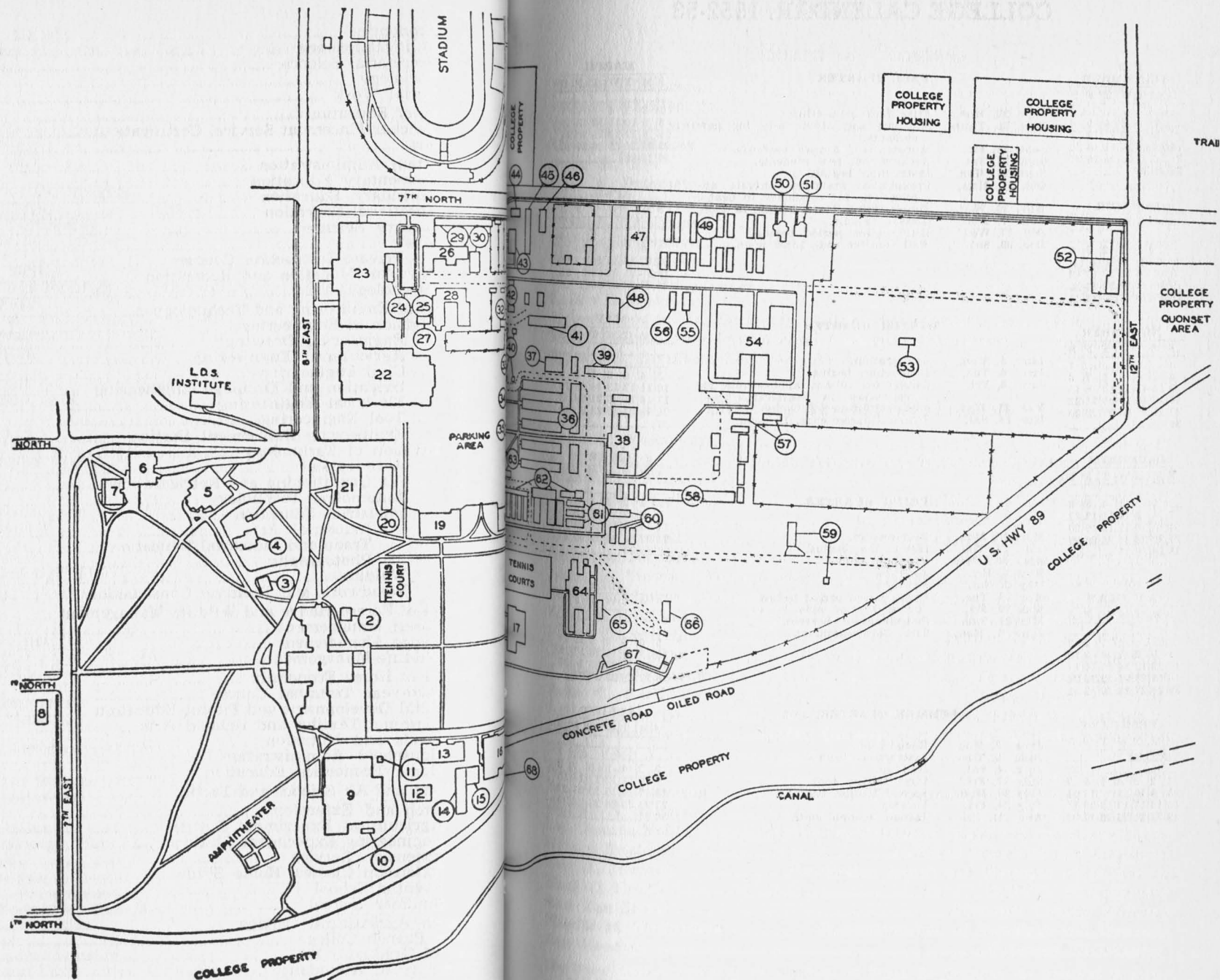
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## LOCATION OF BUILDINGS

- 1 Main Bldg.
- 2 Art Barn
- 3 Extension Service
- 4 President's Home
- 5 Smart Gymnasium
- 6 Boiler House
- 7 Forestry Bldg.
- 8 Practice Cottage
- 9 Mechanic Arts
- 10 Chemical Storage Bldg.
- 11 S.C.S.
- 12 Research & S.C.S. Shop
- 13 Engineering Bldg.
- 14 Farm Mechanics Shop
- 15 Hydraulics Tank
- 16 Home Economics Bldg.
- 17 Library
- 18 Plant Industry Bldg.
- 19 Animal Industry Bldg.
- 20 Chemistry Bldg.
- 21 Widtsoe Hall
- 22 Union Bldg.
- 23 Field House
- 24 Military Storage
- 25 Military Science Bldg.
- 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 Bldgs.
- 37 Boiler House (T-Bldg.)
- 38 Rural Arts
- 39 Chicken Coop
- 40 Chicken Coops
- 41 Chicken Coop
- 42 Poultry Bldg.
- 43 Veterinary Science Bldg.
- 44 Veterinary Science Lab.
- 45 Veterinary Science Lab.
- 46 Veterinary Science Lab.
- 47 Maintenance Bldg.
- 48 Stock Judging Pavilion
- 49 Equipment Storage
- 50 Co-op Bldg.
- 51 Nursery
- 52 U.S.F.S. Equipment Shed
- 53 Radio Lab
- 54 Technology Bldg.
- 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)
- 64 Tub
- 65 Storage (Tub)
- 66 Storage (Lund Hall)
- 67 Lund Hall
- 68 Concrete Water Tank



# COLLEGE CALENDAR, 1952-53

## 1952 SEPTEMBER

S	M	T	W	T	F	S
---	1	2	3	4	5	6
7	8	9	10	11	12	13
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21	22	23	24	25	26	27
28	29	30	---	---	---	---

## OCTOBER

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## NOVEMBER

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## DECEMBER

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## 1953 JANUARY

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## FEBRUARY

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## FALL QUARTER

Sept. 22, Mon. First faculty meeting.  
Sept. 25, Thurs. Aptitude and other tests for new students.  
Sept. 26, Fri. Registration, former students.  
Sept. 27, Sat. Registration, new students.  
Sept. 29, Mon. Instruction begins.  
Oct. 27, Mon. Prospective graduates submit applications for candidacy to deans.  
Nov. 26, Wed. Thanksgiving Recess begins, 12 noon.  
Dec. 1, Mon. Classes resume.  
Dec. 17, Wed. Examination period begins.  
Dec. 20, Sat. Fall Quarter ends 12:00 noon.

## WINTER QUARTER

Jan. 5, Mon. Registration.  
Jan. 6, Tue. Instruction begins.  
Jan. 16, Fri. Candidates submit applications for graduation to Registrar.  
Mar. 11, Wed. Examination period begins.  
Mar. 14, Sat. Winter Quarter ends, 12 noon.

## SPRING QUARTER

Mar. 16, Mon. Registration.  
Mar. 17, Tue. Instruction begins.  
Apr. 30, Thu. Agathon begins  
May 1, Fri. Agathon  
May 2, Sat. Agathon  
May 26, Tue. Examination period begins  
May 29, Fri. Spring Quarter ends, 5 p.m.  
May 31, Sun. Baccalaureate Service.  
June 1, Mon. 50th Commencement.

## SUMMER QUARTER, 1953

June 8, Mon. Registration.  
June 9, Tue. Instruction begins.  
July 4, Sat. Holiday.  
July 17, Fri. First session ends.  
July 20, Mon. Second session begins.  
July 24, Fri. Holiday.  
Aug. 21, Fri. Second session ends.

## MARCH

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## APRIL

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## MAY

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31	---	---	---	---	---	---

## JUNE

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28	29	30	---	---	---	---

## JULY

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19	20	21	22	23	24	25
26	27	28	29	30	31	---

## AUGUST

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23	24	25	26	27	28	29
30	31	---	---	---	---	---

## ADMINISTRATION

## Board of Trustees

Thorpe B. Isaacson .....	Salt Lake City
Herschell Bullen, Jr. ....	Logan
Charles R. Hunter .....	Cedar City
Glenn G. Nielsen .....	Logan
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Daryl Chase .....	Director, Branch Agricultural College
James A. Nuttall .....	Director, Snow Branch College
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Carlton Culmsee .....	Dean, School of Arts and Sciences
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Dee A. Broadbent .....	Acting Director, Agricultural Experiment Station
W. H. Bell .....	Registrar
King Hendricks .....	Director of Libraries
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Joseph N. Symons .....	Dean of Students
Lee Grande Noble .....	Director of Extension Classwork and Home Study
Sylvan Erickson .....	Assistant Secretary and Treasurer
Eric A. Johnson .....	Purchasing Agent and Manager of Bookstore
Karl C. Frank .....	R.O.T.C. Co-ordinator
Ben Van Shaar .....	Manager College Housing
Harold M. Wadsworth .....	Superintendent of Buildings and Grounds
Asa Beecher .....	Veterans Coordinator

The Deans' Council consists of the President, all Deans, the Registrar, the Executive Secretary and Treasurer, and the Directors of the Agricultural Experiment Station, the Extension Service, and Division of Extension Classwork and Home Study.

## Faculty Committees

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

Agenda—Blanch, Vickers, Murray, Oakes, Stoddart

Assemblies—Myers, Symons, Fogelberg, N. W. Christiansen, Student Representatives.

Athletic Council—Hendricks, Caine, H. B. Hunsaker, Board of Trustees Representative, Berntson, J. E. Christiansen, Symons, Alumni Secretary, "A" Men's President, Student Body President, Col. Frank.

Attendance and Scholarship—Brite, Bowen, Draper, Edwards, Richardson, Capt. Richardson, C. J. Skidmore, M. Perry.

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

Credits and Admissions—Sharp, Boyle, Hayward, Jones, N. S. Cannon, Registrar.

Curriculum—Academic Deans.

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

Foreign Students Advisory—Black, Drake, Greenwood, Merrill, Meyer, M. L. Nielsen, Symons, Thorne.

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

Graduation—Meyer, Bell, Mortimer, Kelker, J. A. Bennett, Stone, Porter.

Housing—Van Shaar, Pocock, Owen, W. W. Skidmore.

Library—Hendricks, Academic Deans, Frischknecht.

Lyceum, Lectures and Concerts—Holmgren, Fogelberg, N. W. Christiansen, Berntson,

Personnel and Guidance—Symons, Bell, Stone, Burns, C. J. Skidmore, Lewis.

Pre-Medical, Pre-Dental and Pre-Veterinary Work—Hammond, Culmsee, Gunnell, Bahler, Binns.

Professional Relations and Faculty Welfare—H. B. Hunsaker, Thorne, Gilmore, Stock, Kilburn, Pollard, Blanch, Murray.

Publications Council—Culmsee, Vickers, Keck, Reynolds, M. L. Nielsen, J. Stewart, Sawyer, G. Harrison, Holbrook.

Registration—Academic Deans, Registrar, Symons, Hayward, H. B. Hunsaker.

Schedule—Kelker, Neuberger, Arrington, E. W. Church, Brough.

Student Affairs—Symons, D. Carter, H. B. Hunsaker, Frank, Student Body President, AWS President, four students appointed by student council.

Teacher Placement—Carlisle, Richardson, Mortimer, Cawley, E. Shaw, Secretary.

**Emeritus Faculty**

- Peterson, Elmer George**, B.S., A.M., Ph.D., LL.D.  
President Emeritus
- 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
- Daines, Franklin D.**, A.B., M.A., Ph.D.  
Professor Emeritus of Political Science
- Dalley, Parley**, B.S. M.S.  
Professor Emeritus of Physical Sciences
- 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 Agronomy
- Greaves, Joseph E.**, B.S., M.S., Ph.D.  
Professor Emeritus of Bacteriology and Biochemistry
- Hansen, Reuben**, B.S.  
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**Martineau, V. L., B.S.**

Professor Emeritus Extension Service

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**Newey, Aaron, B.S.**

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**Peterson, Parley E., A.B., C.P.A.**

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**Sorensen, Alma Nicholas, A.B., A.M.**

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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.**

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**Wanlass, W. L., A.B., A.M., Ph.D.**

Dean Emeritus, School of Commerce

**Wrigley, R. L., B.S.**

Professor Emeritus, Extension Service

**Faculty**

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President

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

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

**Adams, Doris Mae, B. S.,**  
Assistant Professor, Home Demonstration Agent, Sevier County.

**Adkins, Gordon H., Sgt.,**  
Instructor in Military Science and Tactics

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

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

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

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

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

**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.,**  
Assistant 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, L. J., B.A., Ph.D.,**  
Associate Professor of Economics

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

**Bagley, LaZone, B.S., M.S.,**  
Assistant Professor, Wayne County Extension Agent

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

- Baird, Glenn, B.S.,**  
Assistant Professor, Extension Agronomist
- Baker, Cecil, B.S.,**  
Associate Professor, Head Basketball Coach
- \*Ballard, J. Clark, B.S., Ph.D.,**  
Assistant Professor of Vegetable Crops
- Bardwell, Flora H., B.S.,**  
Assistant Professor, Home Demonstration Agent, Garfield County
- 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
- Beckstrand, Gordon, B.S.,**  
Assistant Professor, Emery County Extension Agent
- Beecher, Asa L.,**  
Assistant Registrar, Ticket Manager, Veterans' Coordinator
- Beecher, Vern R., B.S.,**  
Instructor in Automotive Mechanics
- Bell, William H., B.S., M.S.,**  
Registrar, Professor
- 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
- Berntson, Russell E.,**  
Executive Secretary and Treasurer
- Biddulph, Clyde, A.B., M.Ph., Ph.D.,**  
Professor of Physiology
- Biggs, Ernest O., B.S.,**  
Assistant Professor, Tooele County Extension Agent
- Bingham, Golden H., B.S.,**  
Associate Professor, Extension Irrigation Specialist
- \*Binns, Wayne, D.V.M.,**  
Professor of Veterinary Science  
Head, Veterinary Science Department
- Bishop, A. Alvin, B.S., M.S.,**  
Associate Professor of Irrigation and Drainage Engineering
- Black, Therel R., B.S., M.A.,**  
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

---

\*On Leave.

- \*\*Blaser, Glenn F., B.S.,**  
Veterans' Coordinator, Associate Registrar
- Boswell, S. R., B.S.,**  
Professor, Utah County Extension Agent
- Bowen, Calvin M., A.B., M.S.,**  
Associate Professor of Forestry
- Boyle, William S., B.A., Ph.D.,**  
Associate Professor of Botany
- Bracklow, Paul E., M/Sgt.**  
Instructor in Military Science
- Brite, J. Duncan, B.S., A.M., Ph.D.,**  
Professor of History
- Broadbent, Dee A., B.S., M.S.,**  
Professor of Agricultural Economics and Marketing,  
Acting Director, Agricultural Experiment Station
- Broadbent, Marden, B.S., M.S.,**  
Associate Professor, Extension County Agent Leader
- 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 to Director, Agricultural Experiment Station
- Burke, Caseel D., B.S., M.S.,**  
Assistant Professor of Education
- Burningham, Melvin S., B.S.,**  
Assistant Professor, Washington County Extension Agent
- Burns, Ann, R.N.,**  
College Nurse
- Burtenshaw, G. Ray, B.S.,**  
Assistant Professor, Juab County Extension Agent
- Burton, Theodore, M., A.B., M.A., Ph.D.,**  
Associate Professor of Chemistry
- Caine, Ann M., B.S.,**  
Instructor, Head of Circulation, Library
- Caine, George B., B.S., M.A.,**  
Professor of Dairy Industry  
Head, Dairy Industry Department

**\*\*On Military Leave.**

- Call, Anson B., Jr., B.S., M.S.,**  
Associate Professor, Box Elder County Extension Agent
- Callan, James M., M/Sgt.,**  
Instructor in Military Science and Tactics
- Cannon, Melvin C., B.S., M.S., Ph.D.,**  
Professor of Chemistry
- Cannon, Norman S., B.S., M.S., C.P.A.,**  
Assistant Professor of Accounting and Business Administration
- Carlisle, John C., B.S., M.S., Ed.D.,**  
Professor of Education  
Head, Secondary Education Department  
Dean, Summer School
- Carlquist, John H., M.D.,**  
Special Professor of Clinical Technology L.D.S. Hospital, Salt Lake City
- Carpenter, G. Alvin, B.S., M.S.,**  
Associate Professor of Agr. Economics and Mktg.  
Assistant Extension Director
- Carter, Don C., B.S., M.S.W.,**  
Acting Head, Sociology Department,  
Associate Professor of Sociology and Extension Sociologist  
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
- Chaney, George C., A.B., M.A., M.D.,**  
Special Associate Professor of Clinical Technology  
L. D. S. Hospital, Salt Lake City
- Child, Rawson D., B.S.,**  
Instructor in Welding
- Christiansen, A. L., B.S., M.S.,**  
Professor, Weber County Extension Agent
- Christiansen, Jerald E., B.S., M.S., C.E.,**  
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  
Head, Instrumental Music Division
- Christofferson, Paul V., D.V.M.,**  
Assistant Professor of Veterinary Science  
in Charge of Provo Laboratory
- Church, Irvan J., Maj.,**  
Assistant Professor of Air Science and Tactics
- Clark, Clayton, B.S., E.E.,**  
Associate Professor of Electrical Engineering
- Clark, Helen I., B.S.,**  
Assistant Professor of Physical Education

- 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
- 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  
Head, 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.,**  
Professor and Director Statistical Laboratory
- Cuff, William W., B.S.,**  
Assistant Professor, Garfield County Extension Agent
- Culmsee, Carlton, B.S., M.A., Ph.D.,**  
Professor of Journalism  
College Editor  
Dean, School of Arts and Sciences
- Cutler, Florence M., B.S.,**  
Assistant Professor, Home Demonstration Agent, Emery County
- Daines, Spencer H., B.S., M.S.,**  
Associate Professor of Agricultural Engineering  
Head, Agricultural Engineering Department  
Extension Agricultural Engineer
- Dalby, John Philip, A.B., M.S.,**  
Instructor in Music
- Daniel, T. W., B.S., M.S., Ph.D.,**  
Professor of Forest Management
- Davis, Freda, B.S.,**  
Assistant Professor, Home Demonstration Agent, Uintah County
- Davis, Lawrence C., B.S.,**  
Assistant Professor, Grand County Extension Agent
- Davis, Lynn H., B.S., M.S.,**  
Instructor in Agricultural Economics
- Dean, Elva, B.S., B.L.S.,**  
Assistant Professor, Associate Librarian
- DeHart, William A., B.S., Ph.D.,**  
Assistant Professor of Sociology
- DeHart, Noble, B.S., M.S.,**  
Instructor, Assistant County Extension Agent, Utah County

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\*On Leave

**Dionne, Edward A., B.S.**

Instructor in Engineering

**Doty, Ina, B.S., M.S.,**

Assistant Professor of Business Administration and Accounting

**Downs, Lois, B.S., M.S.,**

Assistant Professor of Physical Education

**Drake, Eldon M., B.S., M.S., Ph.D.,**

Assistant Professor of Agricultural Education

**Draper, Carroll I., B.S., M.S., Ph.D.,**

Professor of Poultry Husbandry  
Head, Poultry Husbandry Department

**Easimond, Jefferson, B.S., M.S., E.D.,**

Assistant Professor of Education

**Edwards, Maxwell D., A.B., A.M.,**

Assistant Professor of English

**Elich, Joe, B.S., M.A.,**

Assistant Professor of Mathematics

**Ellsworth, S. George, B.S., M.A., Ph.D.,**

Assistant Professor of History

**Embry, Bertis L., B.S., M.S.,**

Associate Professor of Agricultural Engineering

**Erickson, Sylvan, B.S.,**

Assistant Secretary and Treasurer

**Esplin, Grant M., B.S.,**

Assistant Professor, Beaver County Extension Agent

**Everton, Joseph K., B.S.,**

Instructor in Mathematics

**Eyre, Dean, B.S.,**

Assistant Purchasing Agent

**Faunce, Everette, B.S.,**

Assistant Professor, Assistant Football Coach, Baseball Coach

**Fitzgerald, Paul R., B.S., M.S.,**

Instructor in Zoology

**Floyd, J. Whitney, B.S., M.S.,**

Professor of Forest Management  
Head, Forestry Department

**Fogelberg, Thelma, B.S., M.A., Ph.D.,**

Associate Professor of Modern Languages

**Foster, Russell V., Jr., Capt.,**

Assistant Professor of Air Science and Tactics

**Francis, G. S., B.S., M.D.,**

Special Assistant Professor of Public Health

- Frandsen, Arden**, B.S., M.S., Ph.D.,  
Professor of Psychology  
Head, Psychology Department
- Frank, Karl C.**, Col.,  
Professor of Military Science and Tactics, R.O.T.C. Coordinator
- Frazer, Russell S.**, B.S.,  
Special Assistant Professor of Public Health  
Director of Laboratories, Utah State Department of Health
- Frederick, Harold H.**, B.S., M.S.,  
Assistant Professor, Rich County Extension Agent
- Frederickson, Carmen D.**, B.S., M.S.,  
Assistant Professor of Sociology
- Frischknecht, Carl**, B.S., M.S., Ph.D.,  
Professor of Agriculture  
Director of Extension Service
- Fuhriman, Dean K.**, B.S., Ph.D.,  
Associate Professor of Irrigation and Drainage
- Fuller, Pauline**,  
Instructor in Physical Education
- \*\*Funk, Calvin**, B.S.,  
Instructor, Assistant County Agent, Weber County
- Garden, Henry J.**, Capt.,  
Assistant Professor of Military Science and Tactics
- Gardner, Bruce**, B.S., M.S.,  
Assistant Professor of Child Development
- Gardner, Eldon J.**, B.S., M.S., Ph.D.,  
Professor of Zoology
- Gardner, Rhea H.**, B.S., M.S.,  
Associate Professor  
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.,  
Assistant Professor of Horticulture
- Giel, William G.**, 1st Lt.,  
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- Gilmore, Florence R.**, B.S., M.S.,  
Head of Clothing, Textiles, and Related Arts Department  
Associate Professor of Clothing, Textiles and Related Arts
- Gordon, Vaughn W.**, B.S., M.S.,  
Assistant Professor of Physical Education  
Extension Recreation Specialist
- Greaves, Ethelyn O.**, B.S., M.S., Ph.D.,  
Professor of Foods and Nutrition  
Head, Foods and Nutrition Department  
Dean, School of Home Economics

\*\*On military leave

- Greaves, Melvin J.**, B.S., M.C.E.,  
Associate Professor of Civil Engineering
- Greenwood, Delbert A.**, B.S., M.S., Ph.D.,  
Professor of Biochemistry
- Grier, James W.**, Capt.,  
Assistant Professor of Air Science and Tactics.
- Gunnell, Merrill H.**, B.S., M.S.,  
Assistant Professor of Zoology
- Guyman, E. Lee**, B.S., M.S.,  
Associate Professor, Summit County Extension Agent
- Hailes, Charles W.**, B.S.,  
Instructor in Industrial Education
- Hammond, Datus M.**, B.S., M.A., Ph.D.,  
Professor of Zoology  
Head of Zoology Department
- Hansen, A. Kay**, B.S., M.D.,  
Special Assistant Professor of Public Health
- Hansen, Bessie**, B.S.,  
Assistant Professor, Home Demonstration Agent, Box Elder County
- Hansen, Blair I.**, B.S., M.S.,  
Instructor in English
- Hansen, Burrell F.**, B.S., M.A.,  
Assistant Professor of Speech
- Hansen, Vaughn E.**, B.S., M.S., Ph.D.,  
Assistant Research Professor of Irrigation and Drainage
- Hardy, Clyde T.**, B.S., Ph.D.,  
Assistant Professor of Geology
- Harmon, Mont J.**, B.S., M.S.,  
Instructor in Political Science
- Harris, Grant**, B.S., M.S.,  
Assistant Professor of Range Management
- Harris, Joseph R.**, B.S.,  
Research Instructor in Animal Husbandry
- Harris, Leone**, B.S., B.L.S.,  
Instructor, Assist. Documents
- Harris, Lorin E.**, B.S., M.S., Ph.D.,  
Professor of Animal Husbandry  
Chairman, Institute of Nutrition
- Harris, Nadene**, B.S.,  
Instructor, Assistant Cataloguer
- Harrison, Gladys L.**, A.B.,  
Assistant Professor  
Bulletin Editor, Agricultural Experiment Station
- Hart, Philip J.**, B.S., Ph.D.,  
Associate Professor of Physics
- Hassell, Robert L.**, B.S.,  
Assistant Professor, Carbon County Extension Agent

- Hatch, La Prele S.,**  
Instructor, Head Cataloguer
- Hayes, William B., M/Sgt.,**  
Instructor in Military Science and Tactics
- Hayward, J. Clair, B.S., M.D.,**  
Special Assistant Professor of Public Health
- Hayward, Ira N., B.S., Ph.M.,**  
Associate 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
- Henderson, Thomas E., SFC,**  
Instructor in Military Science and Tactics
- Henry, Charles H., B.S.,**  
Instructor in Vegetable Crops
- Hensley, Gaston M., Maj.,**  
Assistant Professor of Air Science and Tactics
- Hess, Alvin, B.S., M.S.,**  
Collaborator in Teacher Training
- Hill, Reuben L., B.S., Ph.D.,**  
Professor of Chemistry  
Head, Chemistry Department
- Hirsch, Frederick H., Sgt.,**  
Instructor in Military Science and Tactics
- Hoard, Frank E. Jr., M/Sgt.,**  
Instructor in Military Science and Tactics
- Holbrook, Neil K., B.S.,**  
Assistant Professor  
Extension Editor
- Holmgren, Arthur H., B.S., M.S.,**  
Associate Professor of Botany  
Curator, Intermountain Herbarium
- Howard, Jack E., SFC.,**  
Instructor in Military Science and Tactics
- Howard, Robert L., Capt.,**  
Assistant Professor of Air Science and Tactics
- Huber, Thelma, B.S., M.S.,**  
Associate Professor  
Supervisor, Extension Home Economics Programs
- Humphrey, Ellen S.,**  
Instructor in Elementary Training School
- Hunsaker, H. B., B.S., M.S.,**  
Professor of Physical Education  
Head, Physical Education and Recreation Department

- Hunsaker, Lloyd R.**, B.S., M.S.,  
Associate Professor of Dairy Industry  
Extension Dairyman
- Hunsaker, Neville C.**, B.A., M.A., Ph.D.,  
Associate Professor of Mathematics
- Hurst, Clyde**,  
Instructor in Diesel Mechanics
- Israelsen, Orson W.**, B.S., M.S., Ph.D.,  
Acting Head, Irrigation and Drainage Department  
Professor of Irrigation and Drainage Engineering
- \*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, William E.**, M/Sgt.,  
Instructor in Military Science and Tactics
- Jenkins, Woodrow R.**, B.S., M.S.,  
Assistant Professor  
Extension Poultryman
- Jensen, J. O.**, B.S.,  
Assistant Professor of Physics
- Jensen, Louis A.**, B.S.,  
Assistant Professor, Duchesne County Extension Agent
- Jensen, Myrile R.**, B.S.,  
Instructor in Elementary Training School
- Jensen, Naomi**, B.S.,  
Assistant Professor, Home Demonstration Agent, Summit County
- Johnson, Eric A.**, B.S.,  
Purchasing Agent and Manager of Bookstore
- Johnson, Fern**, B.S.,  
Instructor, Home Demonstration Agent, Iron County
- Johnson, Leonard M.**, Lt. Col.,  
Assistant Professor of Military Science and Tactics  
Director, Quartermaster Corps
- Johnson, Stanford L.**, B.S., M.A.,  
Instructor in Accounting and Business Adm.
- \*Johnson, Theia**, B.S.,  
Assistant Professor and Extension Clothing Specialist
- Jones, Lewis W.**, B.S., M.S.,  
Associate Professor of Bacteriology
- Jones, Norman F.**, M/Sgt.,  
Instructor in Military Science and Tactics
- Jones, William L.**, B.S., M.S.,  
Assistant Professor of Electrical Engineering
- Kaufman, Alfred**, Maj.,  
Assistant Professor of Air Science and Tactics

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\*On leave

- Kearsley, Amy R., B.S., M.A.,**  
Associate Professor, Home Demonstration Agent, Cache County
- Keck, Wendell M., B.A., M.A., Ph.D.,**  
Associate 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, Ogden Substation
- Klein, Louis, Jr.,**  
Instructor in Aeronautics
- Knowlton, George F., B.S., M.S., Ph.D.,**  
Professor of Entomology  
Extension Entomologist
- Larsen, Jessie, B.S., M.F.A.,**  
Associate Professor of Art
- Larson, Paul B., B.S., M.S.,**  
Associate Professor of Dairying
- \*Lawrence, Aubrey, B.S., M.S.,**  
Assistant Professor of Chemistry
- Lee, Ivan E., B.S.,**  
Instructor in Automotive Technology
- Leonard, M. Prentice,**  
Superintendent, Farmington Substation
- Lewis, Evelyn Hodges, B.S., A.M.,**  
Assistant Professor of Sociology
- Linford, Gene H., B.S., M.S.,**  
Instructor in Zoology
- Litz, Owen E., 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.,**  
Head, Engineering Drawing Department,  
Assistant 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, Cpl.,**  
Instructor in Military Science
- Lund, Kirk, B.S.,**  
Research Assistant in Poultry Husbandry
- 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
- Martin, Maude, B.S.,**  
Associate Professor, Home Demonstration Agent, Weber County
- Matthews, Doyle J., B.S., M.S.,**  
Instructor in Animal Husbandry
- Maughan, Ralph, B.S., M.S.,**  
Assistant Professor of Physical Education  
Freshman Coach
- McAllister, DeVere R., B.S., M.S., Ph.D.,**  
Assistant Professor of Agronomy
- McBride, C. D., B.S., M.S.,**  
Assistant Professor of Industrial Education  
Director of Evening School
- Merkley, Charles N., B.S.,**  
Acting Head, Woodwork and Building Construction Department  
Associate Professor of Woodwork and Building Construction
- Merkley, Margaret B., B.S.,**  
Instructor in Home Economics
- Merrill, Milton R., B.S., M.A., Ph.D.,**  
Professor of Political Science  
Head, Political Science Department  
Dean, School of Commerce
- Meyer, George A., B.A., S.T.B., Ph.D.**  
Professor of Modern Languages  
Head, Modern Languages Department
- Michaelson, Leon, B.S., M.S.,**  
Assistant Professor  
Extension Marketing Specialist

---

\*On leave.

- Miller, Elna, B.S., M.S.,**  
Professor, Extension Nutritionist
- Millett, Robert J., Sgt.,**  
Instructor in Military Science and Tactics
- \*Milligan, Cleve H., B.S., M.S.,**  
Professor of Irrigation and Drainage Engineering  
Head, Irrigation and Drainage Engineering Department
- Miner, Merithyr L., B.S., D.V.M.,**  
Acting Head, Veterinary Science Department  
Associate Professor of Veterinary Science
- Moore, James Reed, B.S.,**  
Assistant Professor, Kane County Extension Agent
- Moore, Raymond R., B.S., M.S.F.,**  
Associate Professor of Forest Management and Extension Forester
- Morgan, Floyd T., B.S., M.A.,**  
Associate Professor of Speech
- Morris, Arthur J., B.S., M.S.,**  
Professor of Dairy Manufacturing  
Extension Dairy Manufacturing Specialist  
Acting Dean, School of Agriculture
- Morris, Laval S., B.S., M.S., M.L.A.,**  
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.,**  
Instructor in 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
- Murray, Evan B., B.S., M.S.,**  
Professor of Economics  
Head, Economics Department
- Myers, Chester J., B.S., A.M., 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.,**  
Instructor in Languages
- Nelson, Mary, B.A., M.S.,**  
Assistant Professor of Mathematics
- Neuberger, L. Mark, B.S., M.S.,**  
Professor of Accounting and Business Administration

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\*On Leave

- Nichols, DeLore, B.S.,**  
Professor, Davis County Extension Agent
- Nichols, Fern S., A.B.,**  
Instructor in Elementary Training School
- Nielsen, Constance, B.S.,**  
Instructor in Elementary Training School
- Nielsen, Harold M., B.S., M.S.,**  
Research Assistant Professor of Veterinary Science
- Nielsen, Marion L., B.S., M.A., Ph.D.,**  
Professor of Modern Languages
- Nielsen, Rex, B.S., M.S.,**  
Assistant Professor of Agronomy
- Nielsen, Sarah S., B.S.,**  
Assistant Professor, Home Demonstration Agent, Millard County
- Nielsen, Veneta L., B.S., M.S.,**  
Instructor in English
- Noble, Lee Grande, B.S., M.S., Ed.D.,**  
Professor of Education  
Coordinator of Extension Class Work, Home Study Evening School, High School Relations
- Nyman, Ross A.,**  
Instructor in Woodwork and Building Construction
- Oakes, Keith R., B.S., M.S.,**  
Assistant 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
- Owen, John L., W-1s,**  
Instructor in Military Science and Tactics
- Packman, Samuel L., M/Sgt., S. Major,**  
Instructor in Military Science and Tactics
- Page, Edna, B.S., M.A., Ph.D.,**  
Associate Professor of Foods and Nutrition
- Pahtz, George,**  
Instructor in Instrumental Music
- Palfreyman, Bernice, B.S.,**  
Assistant Professor, Home Demonstration Agent, Sanpete County
- Parkinson, LaRue, B.S.,**  
Instructor in Elementary Training School
- Parrish, Joseph F., B.S.,**  
Associate Professor, Salt Lake County Extension Agent
- Perkins, Charles J., T/Sgt.,**  
Instructor in Military Science and Tactics
- Perry, Mignon, B.S., M.S.,**  
Assistant Professor of Clothing, Textiles and Related Arts

- Perry, Rolland, A.B., Ph.D.,**  
Professor of Physics  
Head, Physics Department
- Peterson, Dean F., Sr., B.S., M.S.,**  
Instructor in Mathematics
- Peterson, Howard B., B.A., M.A., Ph.D.**  
Professor of Agronomy
- Pittman, Don W., B.S., M.S.,**  
Professor of Agronomy
- Pocock, C. Lester, B.S.,**  
Assistant Manager, Student Housing, Student Employment
- Pollard, Leonard H., B.S. M.S., Ph.D.,**  
Professor of Vegetable Crops  
Head, Vegetable Crops Department
- Porter, Gordon, B.S.,**  
Instructor in Modern Languages, Tennis Coach
- Poulsen, Jenniev J., B.S.,**  
Assistant Professor, Home Demonstration Agent, Utah County
- Poznanski, Mischa,**  
Instructor in Instrumental Music
- Preator, Frederick, B.S., M.Ed.,**  
Professor of Tool Engineering  
Head, Tool Engineering Department
- Price, Lew Mar, B.S.,**  
Professor, Sevier County Extension Agent
- Pryor, Fred R., B.S.,**  
Instructor in Photography
- Ransom, Vilate, B.S.,**  
Instructor, Assistant Cataloguer, Library
- Reynolds, H. Reuben,** Graduate of Chicago Art Institute,  
Professor of Art
- Rice, Moyle O., B.S., M.A.,**  
Associate Professor of English
- Rich, Lyman H., B.S., M.S.,**  
Associate Professor, Extension Dairyman
- Richardson, Charles A., SFC.,**  
Instructor in Military Science
- Richardson, Ralph W., Maj.,**  
Assistant Professor of Military Science and Tactics
- Richardson, Stanley S., B.S., M.S.,**  
Professor and Chairman of Vocational Education  
Head, Agricultural Education Department
- Rickenbach, Rodney G., B.S.,**  
Assistant Professor, Millard County Extension Agent.
- Ricks, Joel E., A.B., A.M., Ph.D.,**  
Professor of History  
Head, History Department
- Robertson, Von H., B.S.,**  
Non-resident Professor of Trades and Industrial Education

**Robinson, Rex E.**, B.S., M.A., Ph.D.,  
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**Robinson, Wilford H.**, B.S., M.S.,  
Research Assistant in Chemistry

**Rogers, Jack A.**, Lt. Col.,  
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Director, Artillery

**Rogers, L. H. S.**, B.S.,  
Instructor, Assistant County Agent, Millard County

**Roning, John**, B.S., M.S.,  
Professor of Physical Education  
Head Football Coach

**Rose, Wayne**, B.S.,  
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**Rowland, Priscilla**, B.S., M.S.,  
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**Rudd, Oris C.**, B.S.,  
Instructor, San Juan County Extension Agent

**Rudersdorf, Molly**, A.B.,  
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**Sawyer, Ferdinand F.**, Maj.,  
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**Sharp, David, Jr.**, B.S.,  
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**\*Sharp, Heber Cannon**, B.S., M.S.,  
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**Shaw, Edith Smith**, B.S.,  
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Supervisor of Elementary Teacher Training

**Shaw, G. Merrill**, B. S.,  
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**Shaw, Richard J.**, B.S., M.S.,  
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Head, Wildlife Management Department

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**Slaugh, Owen,**  
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**Smith, Hubert W., B.A., M.S., Ph.D.,**  
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**Smith, Ralph G., Sgt.,**  
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Head, Bacteriology and Public Health Department

**Somers, Karl W., B.S.,**  
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**Stahlschmidt, Siegfried O., S.F.C.,**  
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**Stanford, J. Sedley, B.S., Ph.D.,**  
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**Steffen, Hyrum, B.S.,**  
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**Stephenson, Alfred B., B.S., M.S., Ph.D.,**  
Associate Professor of Poultry Husbandry

**Stevens, Kenneth R., B.S., Ph.D.,**  
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**Stewart, John J., B. S.,**  
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Head, News Bureau

**Stevens, Marva, B.S.,**  
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**Stevens, Velyn B., B.S.,**  
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**Stoddard, Dan W., B.S.,**  
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**Stoddart, Lawrence A., B. S., M. S., Ph.D.,**  
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Head, Range Management Department

**Stoker, Golden L., B. S., M.S.,**  
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**Stokes, L. Darrell, B.S.,**  
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**Stoll, Calvin C., B.S.,**  
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- Summers, Lowell P.**, B.S.,  
Assistant Professor of Aeronautics
- Swenson, Dan H.**, B.S., M.S.,  
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Assistant Professor of Art
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Professor of Mathematics  
Head, Mathematics Department
- Tingey, Willis A.**, B.S.,  
Assistant Professor of Civil Engineering
- Tippetts, Ruth P.**, B.S.,  
Associate Professor, Consumer Education  
Extension Agent, Ogden City

- Tolman, James, B.S., M.S.,**  
Assistant Professor  
Reference Librarian
- Tueller, Lamont E., B.S.,**  
Associate Professor, Cache County Extension Agent
- Turner, Lewis M., B.S., M.S., Ph.D.**  
Professor of Forest Management  
Dean, School of Forest, Range, and Wildlife Management
- Van Epps, Gordon A., B.S., M.S.,**  
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- Van Shaar, Ben, B.S., M.Ed.**  
Manager of College Housing  
Assistant Professor of Education
- Van Orden, Harris O., B.S., M.S., Ph.D.,**  
Associate Professor of Chemistry
- Vermillion, Una, A.B., M.A.,**  
Professor of Institutional Management  
Manager of Cafeteria
- Vickers, Wallace J., B.S., M.A., Ph.D.,**  
Professor of English  
Head, English and Journalism Department
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- Wadsworth, J. Donald, B.S.,**  
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Director, Agricultural Experiment Station  
Dean, School of Agriculture
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Professor of Botany
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Assistant Professor of Civil Engineering
- Watters, Ray, B.S.,**  
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- Welti, Walter, B.A., M.A.,**  
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Head, Vocal Music Division
- West, Willard J., B.S.,**  
Special Assistant Professor of Public Health

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\*On leave.

- Whitesides, Joseph E., B.S.,**  
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Director and Graduate Manager of Athletics
- Willie, Vernal, B.S.,**  
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- Wilcox, Ethelwyn B., B.S., M.S., Ph.D.,**  
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- Willey, Lynn R., B.S.,**  
Instructor in Auto Body Mechanics
- Williams, J. Stewart, B.S., M.A., Ph.D.,**  
Professor of Geology  
Head, Geology Department  
Dean, Graduate School
- Williamson, David O., B.S.,**  
Research Instructor in Animal Husbandry
- Wilson, LeMoyne, B.S., M.S.,**  
Associate Professor of Agronomy
- Wilson, Ramon, B.S., M.S., Ph.D.,**  
Assistant Professor, Extension Agr. Economist
- Wilson, Warren B., B.S., M.A.,**  
Instructor in Art
- Woodruff, Angus O., B.S.,**  
Instructor in Air Conditioning and Refrigeration
- Yacavone, James L., Jr., Capt.,**  
Assistant Professor of Military Science and Tactics

### FEDERAL COLLABORATORS

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Soil Conservation Service
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Bureau of Plant Industry, Soils and Agricultural Engineering
- Carlson, John W., B.S., M.S., Ph.D.,**  
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- Cope, Oliver B., B.A., M.A., Ph.D.,**  
U.S. Fish and Wildlife Service, Fisheries Research
- Clyde, George D., B.S., M.S.,**  
Chief, Division of Irrigation, Soil Conservation Service
- Dorst, Howard E., A.B., M.A.,**  
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- Lieberman, Frank V., B.S.,**  
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Bureau of Entomology and Plant Quarantine
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- Snow, Sterling J., B.S.,**  
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## BRANCH AGRICULTURAL COLLEGE

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Dean of Students
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- Staples, Rhea**,  
Cashier
- Cloward, McRay**,  
Manager of Bookstore and Student Housing
- Cox, R. Reid**,  
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- Matheson, Edward G.**,  
Superintendent of Heating Plant and Grounds

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Chairman, Division of Engineering and Mathematics
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Assistant Professor of Elementary Education and English  
Supervisor of Teacher Training
- Cooley, Charles B.**, B.S., M.Ed.,  
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Chairman, Division of Industrial and Vocational Education
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Associate Professor of Business
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Professor of Physical Sciences  
Chairman, Division of Physical Sciences
- Davis, J. Victor**, A.S.,  
Instructor in Auto Mechanics
- Gates, David Q.**, B.S.,  
Instructor in Physical Education and Coach
- Graber, Frederick L.**, M/Sgt.,  
Instructor in Military Science
- Halverson, Roy L.**, B.S.,  
Professor of Music
- Hardy, Eugene**, B.S.,  
Assistant Professor of Machine Shop and Welding

- Harris, Oliver W.**, Major,  
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Chairman, Division of Air Science and Tactics
- Haich, Conrad V.**, B.S.,  
Instructor in Chemistry
- Hill, Walter R.**, T./Sgt.,  
Instructor in Air Science
- Johnson, Blaine**, B.S., M.A.,  
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- Jones, Eulalia B.**, B.A.,  
Librarian
- Jones, Jennie B.**, B.S.,  
Instructor in Secretarial Science
- Kimball, Fern**, B.S.,  
Instructor in Home Economics and Institutional Management
- Kupfer, Vern K.**, B.S., M.S.,  
Assistant Professor of Psychology and Social Science
- Lamb, Ann**, B.S.,  
Instructor in Physical Education
- \*LeBaron, George L.**, B.S.,  
Instructor in Physics and Radio
- Magleby, V.R.**, B.S.,  
Assistant Professor of Agriculture and Biology
- Matthews, Darrell H.**, B.S.,  
Assistant Professor of Animal Husbandry
- Maughan, Reese P.**, B.S., M.A., Ed.D.,  
Professor of Education  
Chairman, Division of Education
- McAfee, Garn T.**, M/Sgt.,  
Instructor in Air Science and Tactics
- McMillan, Mary**, B.S., M.A.,  
Instructor, Elementary Education  
Coordinator of Teacher Training
- Moore, Lanice**, B.S.,  
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- Peterson, Edwin L.**, B.S., M.A.,  
Assistant Professor of Social Science  
Chairman, Division of Social Sciences
- Petty, Cleo M.**, B.S.,  
Assistant Professor of Physical Education and Coach
- Plummer, H. J.**, B.A., M.A.,  
Assistant Professor of English
- Rigby, Eldro**,  
Farm Manager
- Robinson, Max E.**, B.S., M.S.,  
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\*On Leave

**Rowley, Richard M., B.S.,**  
 Instructor in English  
**Sargent, David L., B.S., M.S.,**  
 Professor of Biology  
 Chairman, Division of Biological Sciences  
**Schmidt, Ludwig, Maj.,**  
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**Schmutz, Clarence, B.A., M.A.,**  
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 Chairman, Division of Agriculture  
**Stephensen, A. W., B.S., M.B.A.,**  
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**Tippetts, Twain, B.A., M.A.,**  
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 Chairman, Division of English  
**\*Wahlquist, A. Glen, B.S., M.S.,**  
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**Zollinger, Leah, B.S.,**  
 Instructor in Clothing and Dormitory Matron  
 -----  
 Librarian

## SNOW BRANCH

### Officers of Administration

**Nuttall, James A., M.S.,**  
 Director  
**Thompson, Lee R., B.S.,**  
 Treasurer  
**Stevensen, Elna, A.S.,**  
 Registrar  
**Benson, Marie O.,**  
 Secretary to President  
 Bookstore Manager  
**Nielson, VeLois, B.S.,**  
 Librarian  
**Paulson, Delphia T.,**  
 Manager of Cafeteria  
**Olsen, Goldie,**  
 Assistant Manager Cafeteria  
**Jensen, J. Edwin,**  
 Superintendent of Buildings and Grounds  
**Bailey, Fred,**  
 Building and Grounds

### Faculty

**Allred, Vance,**  
 Instructor in Art  
**Anderson, DeVon, B.S., M.S.,**  
 Instructor in English and Music

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 \*On Leave

- Auger, Clede, B.S.,**  
Instructor in Home Economics  
Head, Division of Home Economics
- Carpenter, J. Gerald**  
Instructor in Industrial Arts  
Head, Division of Industrial Arts
- Crane, Joseph W., A.B., M.A.,**  
Assistant Professor of Speech
- Christensen, H. Reed, B.S., M.S., Ph.D.,**  
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Head, Division of Physical Sciences
- Dean, H. A., B.S., M.S.,**  
Assistant Professor of Music  
Head, Division of Music
- Gray, A. Russell, B.A., M.A.,**  
Associate Professor of Foreign Languages and Humanities
- Grover, Anna, B.S.,**  
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- Mangelsen, Ferrin L., B.S., M.S.,**  
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- Mikkelsen, Seymour, B.S.,**  
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Head, Division of Agriculture
- Mikkelson, Elwin N., B.A., M.A.,**  
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Acting Head, Division of Biology
- Peterson, Rulon, B.S.,**  
Instructor in Chemistry, Physics and Mathematics
- Phillips, Lucy B., A.B., M.A.,**  
Associate Professor of English  
Head, Division of English
- Rasmussen, Roger J., B.S.,**  
Instructor in Agriculture  
Farm Manager
- Ray, Nellie, B.S., M.A.,**  
Assistant Professor of Business  
Head, Division of Commerce
- \*Stutz, Howard C., B.S., M.S.,**  
Instructor in Biology
- Stout, Clayton,**  
Instructor in Auto Mechanics
- Tippetts, A. I., B.S., M.S.,**  
Associate Professor of Economics, Social Philosophy  
Head, Division of Social Sciences
- Turner, W. DeVerl, B.S.,**  
Instructor in Business
- Williams, James J., B.S.,**  
Assistant Professor of Physical Education, Coach,  
Head, Division of Physical Education and Athletics

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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 Burlington Trailways and 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 this 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, and Dr. Franklin S. Harris in 1945. Dr. Louis Linden Madsen was inaugurated as eighth president in 1950. From one building in 1890, the number of buildings has reached thirty-eight, plus many temporary buildings of various sizes. The college faculty has grown from 9 in 1890 to nearly 500 in 1951, and the student body has expanded from 139 in the beginning to a cumulative total of the regular school year of 4,284 regularly enrolled students in 1950-51. In addition, several hundred students were enrolled in "related instruction" courses.

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. Opportunities for greatly broadened training for the youth of southern Utah were thus made available in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Science, and Education.

Since 1936, the Branch Agricultural College 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 the B. A. C. 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 Branch Agricultural College is directed by Dr. Daryl Chase, formerly Dean of Students and Director of Student Personnel on the campus 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 on the campus at Logan, and co-operative effort is steadily increasing the integration of these offerings. Establishment of a permanent residence center for Upper Division work

will still more closely link the work of the two campuses. Deans of the parent institution at Logan supervise work in the corresponding divisions at Snow College.

Mr. James A. Nuttall has been director of Snow College since 1936.

## PHYSICAL PLANT

The physical plant of the College, built over a period of half 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 view from College Hill in every direction is a pleasing vista, including valley, green fields, meandering streams, and distant horizons.

### Buildings and Facilities

To house its varied and growing educational and research activities, the College now has more than forty 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 Agricultural Economics, Art, Education, Geology, Landscape Architecture, Mathematics, Modern Languages, Music, Psychology, Sociology, Speech, Zoology, and the Schools of Arts and Sciences and Commerce. The College bookstore is in the basement. The main auditorium, meeting place for most student gatherings, is in the east wing of the building. A Studio Theatre, used by the Speech department, and the broadcasting studios of radio station KVSC are on the second floor, west wing. Offices of the Dean of Students, Dean of Women, and officials who supervise war veteran enrollees are on the first floor, north wing.

The combination Home Economics and Commons Building is the social and cultural center of the College. It is used exclusively for College functions of both students and faculty. This building houses a cafeteria with well-equipped kitchens and dining rooms for the comfort and convenience of students and faculty. Educationally, this structure functions as the housing 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. Student Body offices are in this building only until they can be moved into the new Student Union Building.

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 the offices of the College physician and school nurse.

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 4,000. 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, and a large gun shed. 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 extension educational service organization, 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, and Vegetable Crops. 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 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, and 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.

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 Practice House just west of the campus.

Anticipating a permanent Union Building, students began in 1946 to enjoy the recreational facilities of a temporary Union Building east of the Library. The new Union Building will be at least partially occupied during the present school year.

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

The College barns are suitable for the care of cattle, horses, sheep and swine with ample storage for feeds. In the College-owned herds are various pure-breeds of livestock common to the intermountain region. An experimental Holstein herd is maintained and operated by the College and Experiment Station on a modern dairy farm located at North Logan, one mile north of the campus. All livestock owned by the College is maintained largely on College-owned property. A stock Judging Pavilion makes it possible to do stock judging under comfortable conditions at all seasons.

The Poultry Plant, built on the colony plan, is equipped for class and experimental research work in poultry husbandry. 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.

### Housing

The College operates several housing units for both single and married students. Lund Hall, on our 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.

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 apartments in quonsets are also available.

Three types of family living units are available. Comfortable heated apartments in the Pre-Fab 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 trailer park operated by the College.

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 Manager, 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 spectrograph, and an ultracentrifuge.

### The Libraries

The College Library system consists of the Main Library and nine branches: Home Economics, Engineering, Commerce, Forestry, Claypool Map, Moore Children's Library, Bindery, Whittier, and 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. Except for the Moore Library, located in the main library building, 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, using only 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 bureaus and agencies for additional series not available through the Superintendent of Documents. It also

has an exchange agreement with 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 Moore Library, 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. The collection 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. This collection is in the Moore Library.

Bibliophiles and persons interested in their subject content will be interested to know of the Ann McQuarry Hatch rare book collection. The collection is devoted chiefly to architecture and interior decoration and design. Books are available for perusal or restricted loan in the Home Economics Library.

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

1. Athletics for both men and women. The intramural program includes all seasonal sports, for which awards are given.

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

3. Theatricals. Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting. Performances in recent years have been of high quality.

4. Opera. Each year the Music Department produces an opera. Successful performances of such works as Rigoletto, Faust, Aida, Il Trovatore, Carmen, Student Prince, and Blossom Time have made annual production of an opera or musical comedy traditional.

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

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

7. Lyceum Civic Music. The Lyceum Civic Music series presents numerous national and international figures. During 1951-52 such performers as Jan Peerce, Jakob Gimpel, Ruggiero Ricci, Louis Fisher, Paul Douglas, and others were brought to the campus.

8. Dances and Entertainments. In addition to the above, the Student Body Organization furnishes weekly entertainment in the form of dancing parties and athletic events.

9. Assemblies. Tuesday, 11 o'clock assemblies, planned by a joint student-faculty committee provide lectures, debates, dramatic presentations and concerts for the entertainment and development of students.

### Organizations

More than 100 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 the number of students from foreign lands has increased. Special adjustments have been made to help meet their needs in English

and Speech work and other activities. The Cosmopolitan club for both foreign and American students is active.

In 1950 the following countries were 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.

### U. S. A. C. ALUMNI ASSOCIATION

W. W. Gardner, President

The Utah State Agricultural College Alumni Association now numbers more than 5,000 members.

Alumni of Utah State Agricultural College have achieved outstanding prominence in every walk of life. Many Aggie alumni served in the late war, and an exceptionally large number of them held or are holding high commissions in the military and naval forces.

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

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

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

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

**Function.** Besides maintaining a complete record of each alumnus after graduation, two special projects have been originated and sponsored by the Alumni Association—the Library Endowment Trust Fund and the Life Membership Fund. Earnings from the former fund, accumulated from popular subscriptions, are given to the College Library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.

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

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

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

**Clifford R. Poole, 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 helps to build and maintain a sound athletic program. The organization has an annual scholarship in amount equal to the resident tuition to a deserving athlete, either resident or non-resident of Utah. Other scholarships are gradually being made available by the "A" Men's group.

### **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 Branch Agricultural College 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.**

**E**NTRANCE with college standing is based upon (a) graduation from an accredited high school or (b) upon presentation of fifteen approved high school units of work or (c) by examination of those students eighteen years of age or older who have had other training.

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

Entrance by examination is based upon two types of tests developed by the U. S. Armed Forces Institute or other comparable tests approved and recommended by the American Council on Education. **First**, the tests of general educational development which are designed to measure the extent to which all of the educational experiences of the applicant for admission have contributed to his ability to "carry on" in a program of general education, or to his educational development to the type which might otherwise have resulted from attendance in a regular academic

high school. **Second, Subject Examinations:** Each of these subject examinations may be used to determine whether the achievement of the applicant for admission is the equivalent of that expected of regular high school students for satisfactory completion of a corresponding course of classroom instruction.

Students who do not otherwise meet the entrance requirements 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 eighteen years of age may not enter with a high school deficiency.

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

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

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

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

**4. 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 the more general activities of living.

Students who expect to become candidates for any degree or diploma from any of the schools of the College must include among the units presented those preparatory courses specified as prerequisite to beginning college courses in the various fields. Such students are urged to give serious thought to the selection of a major field of interest. Each student in cooperation with his parents, high school principal or other high school 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 evaluation become the property of the Institution, and will not be returned. Transcripts should be sent to the Registrar four weeks in advance of registration. It is necessary to have them at the time of registration, in order to arrange the course of study properly.

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

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

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

## 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 25, 26 and 27. Classes will begin Monday, September 29.

For the Winter Quarter, all students will register on Monday, January 5. Classes will begin Tuesday, January 6.

Registration for the Spring Quarter will be on Monday, March 16. Classes will begin Tuesday, March 17.

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

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

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

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

The registration is construed to include any Extension, Correspondence, Institute, or other work carried by the student for credit or for removal of high school deficiencies during the period of the school year in question.

No student will receive credit for residence work not included on his registration card, which must be filed in the Registrar's Office before the end of the quarter. Students who wish to attend regularly any class for which they are not registered must obtain a visitor's permit from the Registrar's Office. No credit is allowed for such attendance.

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

**Withdrawal from Classes:** The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's Office, is considered the student's official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official "Change of Registration" form is filed with the Registrar's Office, before the end of the quarter, F grades 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. 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.

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

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

**Credit by Examination:** In special cases, students may be permitted to obtain college credit by passing examinations in subjects not taken in course. Credit for a subject taken in course for which a grade other than passing has been received cannot be acquired by means of special examination. This privilege does not 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.

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

**Low Scholarship and Probation:** Students who have not maintained an average grade of C or better and students failing to obtain passing grades in 12 or more credits during the preceding quarter are automatically placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the student body organization.

Students in the low scholarship group 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 hour of Physical Education or Military Science.

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

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

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

## LOWER DIVISION

**T**HE 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 of the College 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 special placement examination in English is required of all freshmen.

2. Freshman students in the School of Engineering and Technology and in the School of Forest, Range, and Wildlife Management are required to complete English 17, 18, and 19. Students who start this series should continue throughout the three quarters, even if they transfer from Engineering or Forestry to other schools.

3. All other students are required to complete English 10 in the sophomore year.

Note: For graduation all students must present nine credits in English Composition (See Paragraph 6 under "Summary of Requirements for Graduation.")

## GROUP REQUIREMENTS

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

**1. Biological Science.** This group requirement may be satisfied by taking any one of the following combinations of courses:

A. Biology (Botany 1 or Zoology 1) and either a lower division Bacteriology course, or Physiology 4.

B. When more technical courses are required they may be used to satisfy this group requirement if taken in any of the following sequences:

1. Botany 24, 25.

2. Zoology 3, 4.

3. Zoology 2 and Botany 25, or any lower division Bacteriology course.

Students who already have a satisfactory knowledge of general biology, as demonstrated by examination, may satisfy this group requirement by taking Physiology 4 and any lower division Bacteriology course.

**2. Exact Science.**

Chemistry—any course of Lower Division grade.

Geology—any course of Lower Division grade.

Mathematics—any course of Lower Division grade.

Physics—any course of Lower Division grade.

(Physical Science 31 and 32 are recommended. These courses are built around principles 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 (see Military Science and Tactics).

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 (quarters 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. The requirement that at least one quarter (at least 12 credits) of the Senior year must be done in residence at this Institution is waived for such students.

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

**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 applied work in certain departments; the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy; and gives work to fulfill the requirements for all the professional certificates issued by the State Board of Public Instruction.

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

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

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

### TERMINAL CERTIFICATE

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

In the Schools of Agriculture and Home Economics the courses are arranged so that the student may, at a later date, complete the four-year course with a minimum loss of time. While these short courses are designed to develop a broader understanding of the sciences underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in both the Lower and Upper 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 1953, 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 Science for men unless officially excused from this requirement. Students are normally required to complete the basic military course of six credits during the Freshman and Sophomore years. Men exempt from Military Science are required to substitute one quarter of Physical Education for each quarter of Military Science from which they are exempt. If exempt from both Military Science and Physical Education, candidates must present one credit of other work for each quarter they have been exempt.

The advanced course consists of the third and fourth year of Military Science. Entrance upon the advanced course is elective, but once entered upon, the course becomes a prerequisite for graduation, unless the student shall be discharged in accordance with the provisions of Army Regulation 145-10.

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

4. 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, Smith-Hughes Teacher Training courses, Engineering and Technology.

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

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

9. Candidates for a Bachelor's degree must have studied in residence at Utah State Agricultural College during three full quarters, a full quarter being a quarter in which at least 12 residence credits are earned.

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

10. Four passing grades, "A," "B," "C," and "D" are employed in reporting credit. No credit with grade lower than "D" can count toward satisfying credit requirements. The maximum number of "D" grades counting as credits shall be 36 credits.

Grade points have been assigned to grades as follows: 3 grade points for each credit of "A," 2 for each credit of "B," 1 for each credit of "C," zero for each credit of "D." A deduction of one grade point will be made for each hour of failure. For graduation, a student must have as many grade points as he has credits for which grades of "A," "B," "C," "D," and "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" containing information requested, with the Graduation Committee 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 who are unable to attend must notify the Graduation Committee in advance.

15. The College may withhold its diploma from a candidate who has proved himself morally unworthy.

#### **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 D. Wynne Thorne

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 Lawrence A. Stoddart  
School of Home Economics—Professor Ethelwyn B. Wilcox  
Social Work (Division of)—Professor Don C. Carter  
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. All successful applications must receive the approval of the department in which the student 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.

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

### Master's Degree

Majors for the Master of Science degree are offered in all 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 course service 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. The 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 three quarters of residence;
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.

**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 represent a contribution to the field of knowledge, based on the student's own research, or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be typewritten in standard form; and a copy 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:** "Plan B" Reports: 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 the "Plan B."

**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 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. 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.

### **Master's Degree in General Agriculture Under "Plan B."**

The Dean of the School of Agriculture acts as major professor to students working for this degree. The student's program must include a minimum of 6 credits each in the fields of Plant Science, Animal Science, and Agricultural Economics.

### **Degree of Irrigation Engineer**

The School of Engineering and Technology offers a two-year graduate program in Irrigation Engineering leading to the degree of Irrigation Engineer. The plan of study for this degree 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 the degree of Irrigation Engineer includes:

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 this degree 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;

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.

**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 departments.

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

**Preliminary 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 \$810 for one-third teaching service on a nine-month basis. Remuneration for research assistantships may vary from \$810 to \$1,500 dependent upon the time of service involved. All assistantships are arranged so as to allow the student to complete work for his Master's degree in two years. At present, assistantships are available in the following departments: Animal Husbandry, Accounting and Business Administration, Agricultural Economics and Marketing, Agronomy, Art, Auto Mechanics, Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, Child Development and Parental Education, Civil Engineering, Dairy Industry, Economics, Education, English, Entomology, Forestry Management, Foods and Nutrition, Geology, Horticulture, History, Irrigation and Drainage, Instrumental Music, Mathematics, Modern Languages, Physiology, 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.

**STUDENT FEES****Resident Students**

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Registration Fee .....	\$10.00		
Tuition .....	17.00	\$17.00	\$17.00
Student Body .....	6.00	3.00	3.00
Athletic Fee .....	2.00	2.00	2.00
Class Fee .....	1.00		
Building Fee .....	7.00	7.00	6.00
Total Fees .....	\$43.00	\$29.00	\$28.00
Plus Federal Tax .....	.40	.40	.40

**Non-Resident Students**

	Student's First Quarter	Student's Second Quarter	Student's Third Quarter
Registration Fee .....	\$10.00		
Non-Resident Fee .....	35.00	\$35.00	\$35.00
Tuition .....	17.00	17.00	17.00
Student Body .....	6.00	3.00	3.00
Athletic Fee .....	2.00	2.00	2.00
Class Fee .....	1.00		
Building Fee .....	7.00	7.00	6.00
Total Fees .....	\$78.00	\$64.00	\$63.00
Plus Federal Tax .....	.40	.40	.40

In addition, each student, whether resident or non-resident, is required to pay a Materials and Laboratory Fee each quarter which varies with the respective schools according to the following schedule:

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

**SPECIAL FEES**

Special Students—Registration fee .....	\$10.00
Plus \$2.50 per credit hour (maximum 6 credits) .....	
Chemistry Laboratory deposit .....	5.00
Bacteriology 2, 70, 102, 105, 110, 120, 131, 160, 168 .....	3.00
Geology 3, deposit for loss and breakage .....	5.00
Military Uniform deposit .....	5.00
Aeronautics 37, 137, 138, 139—\$10.00 per clock hour for dual instruction and \$8.00 per clock hour for solo instruction. ....	
Horticulture 118 .....	20.00
Welding 41, 41a, 42, 42a, 43, 43a, 44, 44a, 45, 45a, 46, 46a, 91, 92, 93, 94, 96, 190, 191 per credit hour .....	1.50
School of Forest, Range, and Wildlife Management—Senior Field Problems:	
Forestry 146 .....	35.00
Range Management 196 .....	30.00
Wildlife Management 171a .....	30.00
Wildlife Management 171b .....	10.00
Diploma Fee .....	5.00
Social Work Certificate .....	5.00
Cap and Gown rental—Bachelor of Science .....	2.25
Master of Science .....	5.00
Late Registration, per day (maximum \$5.00) .....	1.00
Locker rental .....	1.50

Master's Degree Fee for binding and proofing thesis .....	5.00
Teacher placement fee .....	2.00
Teacher placement re-registration .....	1.00
Registration as listener in lecture course in which no credit is derived, per subject .....	5.00
Related Training Courses, 58c per clock hour (or per contract with the Veteran's Administration.)	

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

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.

**Fees for Veteran Students** differ from those stated in this section insofar as the Veterans Administration pays actual cost of instruction on a credit hour basis in lieu of the regular tuition and out-of-state fees.

Fees for Private Instruction, 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, Max .....	30.00	Torbensen, Eldon .....	30.00
Greenwood, Maxine .....	25.00	Wasserman, Irving .....	30.00
Lundquist, Thelma .....	20.00	Welti, Walter .....	35.00
Odd, Mrs. Wallace .....	20.00	Welti, Mrs. Walter .....	30.00

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

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

Teacher Placement Fee, \$2. Required of all students applying for Teacher's Certificate.

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

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

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

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

According to the constitution of the Associated Students, every regular student must obtain, at time of registration, a Student Body card which will admit him to all activities controlled by the Associated Students: athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc., and, in addition, give him a copy of the annual yearbook and a subscription to the College paper. This system has been found to be a great saving to the students and a most excellent means of fostering proper interest in student activities.

Since all women students are required to take Physical Education, they must provide themselves with gymnasium suits and gymnasium shoes. The cost is about \$5.00.

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

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

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

Good board and room in private homes costs from \$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.** A number of candidates for the 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 for a Rhodes Scholarship. 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. Full information and application blanks may be obtained from Dr. Sherwin Maeser, college representative of the Rhodes Scholarship Committee.

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

**The Rollo M. Rich Memorial Scholarship** is awarded annually to an outstanding student 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 bearing the name of Louisa Y. Robinson, 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 Scholarships.** For Freshmen in the School of Agriculture the company offers 25 scholarships of \$100 each, \$50 of which is paid at the beginning of the fall term and \$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 of this award who has the best scholarship record at the end of his freshman year will receive an additional scholarship for one or two more years. All applications must be submitted to the Dean of Agriculture before June 1. Application blanks and additional information may be obtained from the Dean's office.

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

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

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

**Alpha Zeta Award.** An award made annually by Alpha Zeta fraternity, honor society of agriculture and forestry students, to the sophomore in the School of 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.

**Swift and Company Essay Contest.** Each year Swift and Company conducts an essay contest. The winner is awarded a trip to the International Livestock show at Chicago, where he spends approximately a week studying the meat packing industry. All essays must be submitted in the Dean's office on or before November 1. Further information may be obtained from the Dean's office.

**The Leadership Challenge Cup** is 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 various 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 Senior students upon the following basis: (a) application of Home Economics ideals to daily living, 50 points; (b) leadership in class work and other activities, 50 points. The number of awards shall not exceed 5% of the total graduating class. The candidates eligible shall have a grade point average of two or better.

**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 Engineering student. The award is made on the basis of scholarship, promise as an engineer, and need. Selection is made by a special committee representing the A.G.C. and the Civil Engineering Department. Applications for the succeeding year must be filed with the Dean of Engineering 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 bases 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 bases 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 practicibility. 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 to 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 the Salt Lake City office or at one of its bureaus, during the summer months between the junior and senior years. The winner is selected by judges representing USAC and the News.

**Salt Lake Tribune** offers annually two scholarships to outstanding seniors in Utah high schools. One is awarded to a boy for study of agricultural journalism at the U. S. A. C. The other is awarded to a girl for study of home economics journalism.

#### Medals and Other Awards

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

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

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

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

**Scholarship A's** in the form of gold pins are given to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic

Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholastic A award.

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

**Alpha Kappa Psi Scholarship Award.** Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior 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 record in Commerce.

**Delta Beta Chi Award.** Ten dollars is awarded annually by the Delta Beta Chi Chemistry Fraternity to the Freshman or Sophomore chemistry student who writes the best essay on some subject in Chemistry.

**William Alger Awards.** A gold key is awarded annually by Alpha Epsilon Delta, premedical 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 solutions, 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 women students of the Institution who show evidence of greatest measure of (a) potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points); and (b) womanly qualities, development of the social graces, not necessarily social prominence, and attitude of mind (50 points).

**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

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

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

**Rotary Club Senior Loan Fund.** The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year. Further information may be obtained from Mr. N. D. Salisbury, First Security Bank, Logan, or the chairman of the Awards and Honors Committee.

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

**The W. B. Rice Memorial Loan Fund** provides loans of up to \$200.00, usually for a period of one year, to deserving students in the School of Forest, Range and Wildlife Management. Application should be made to the Office of the Dean.

### GUIDANCE PROGRAM

The College guidance program is intended to help the student discover his needs, assess his potentialities, and achieve effective self-direction. This program is closely integrated with the instructional program. 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 Counselor of Students 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 and parole officers. The services include:

1. Educational and vocational guidance.
2. Diagnosis and guidance for gifted, subnormal, and delinquent children.
3. Diagnosis and recommendations for treatment of conduct and personality maladjustments.

4. Diagnosis and recommendations for remedial instruction for achievement difficulties in reading, language, arithmetic, general study habits, and other subjects.

5. Assistance to speech correctionists in the diagnosis and corrective treatment of speech defectives.

6. Administration of tests to determine matriculation status of students who have not completed their high school requirements.

Students desiring appraisal of ability, interests, etc., may receive this service through the facilities of 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. Counselor's office is Main 217.

### 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 three 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. A health record is kept of every student.
  2. Re-checks and follow-up medical care are given students who require special observation.
  3. Laboratory tests, blood counts, urinalyses, and Wasserman tests are given as part of the physical examinations, if indicated, or as aids to physicians in making a diagnosis.
  4. Immunization against smallpox is given without cost to the student. For other vaccinations or tests that students request, the student furnishes the vaccine or serum.
  5. The Health Service offers out-patient dispensary care, with an unlimited number of office calls. Office hours: 8:00 a.m. to 5:00 p.m. (including noon hour) daily, on school days.
  6. X-ray, for students who are injured while participating in school activities. When X-Ray is authorized by the school physician, it is made without cost to the student.
  7. Infirmary or bed care is not furnished.
  8. The physician is available for emergency calls for injuries that occur during campus activities.
- The College physician will call, during the morning hours, on students who are ill in their homes. Therefore, he should be notified before noon on the day of illness. Students who are ill and come to school, regardless of their physical condition, should come to the Student Health Service in the Smart Gym before attending classes. This would help to safeguard the school against contagious disease. Prompt reporting of illness would expedite care and prevent many night calls. In the past, the majority of night calls have been for illnesses of more than 24 hours' duration and should have received attention during regular school hours.
9. The physician does not make home calls for accidents which occur off the campus or in the homes of students.
  10. The Student Health Service is located in Room 12, Smart Gymnasium.
  11. If you wish to contact the Health Service call Extension 51. Nurses' hours are from 8:00 to 5:00 daily, on school days.
  12. This service does not include the wives or children of students.
  13. The students do not pay a health fee.
  14. It is highly recommended that students purchase the Student Accident Insurance available to them.

**Note:** When the Utah Public Health Mobile T. B. X-Ray unit visits the campus, all students and employees are expected to have chest X-Rays.

### 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.

Remedial training is 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. Clinician's office is Main 377.

## 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

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## SCHOOL OF AGRICULTURE

R. H. WALKER, DEAN

**T**HE 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 Short-horn beef cattle. The Sears-Roebuck Foundation has given \$12,000 towards purchase of foundation beef cattle. Four breeds of sheep, Rambouillet, Columbia, Hampshire, and Southdown, 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 College 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 also 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 desires a broad general training in scientific and practical agriculture.

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

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

## GENERAL AGRICULTURE

The course in general agriculture is designed to meet 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:

	Credits	
<b>(a) Minimum Requirements in Following Divisions:</b>		
Agricultural economics .....	9	
*Applied plant sciences .....	26	
**Applied animal sciences .....	26	
Engineering and technology .....	9	
Total .....	70	
<b>(b) Physical Science, Biology, Social Science, and Language and Arts:</b>		
<b>Physical Science</b>	<b>Credits</b>	<b>Total</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 1 & 2 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 .....	3	
Other social science courses (See College group requirements) .....	5	8
<b>Language and Arts</b>		
Eng. 10 & 110 .....	9	
College group requirements (See College group requirements) .....	8	17
<b>(c) Military Science or Physical Education</b>		
	6	6
		79 to 86
Total credits prescribed .....	151	
Elective .....	35	
Total .....	186	

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

Soils 56 is required as part of the 26 credits.

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

## SPECIALIZED AGRICULTURE

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

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 1, 2 and 70, 71

Zoology 1 or Botany 1

Physiology 4

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

Prin. of Econ. 53, 3 credits; Ag. Econ. 102, 162, 6 credits.

Social science group, 8 credits.

Language and Arts group, 8 credits

English 10 & 110

Agron. 56

A total of 186 credits, 54 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, Vegetable Crops, 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 3-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, 70, 102, 162; 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; Vegetable crops 1, 2; 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; **D. A. Broadbent**, **V. L. Israelsen**, Professors; **R. H. Anderson**, **E. M. Morrison**, Associate Professors; **Wells M. Allred**, Assistant Professor; **Inez B. Tingey**, Research Assistant; **M. H. Taylor**, **Ramon Wilson**, **Leon C. Michaelson**, Extension Economists; **H. R. Hochmuth**, Federal Collaborator in Research. **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 Department staff with the assistance of graduate students. The following courses in Agricultural Economics given by the department may be used for graduate credit: 102, 103, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122, 123, 162, 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

#### FRESHMAN

Fall		Winter		Spring	
Course	Hours	Course	Hours	Course	Hours
Accounting 1 .....	5	Accounting 2 .....	5	Literature .....	3
Speech 1 .....	5	Math. 34 .....	3	Math. 35 .....	5
Zool. 1 or Bot. 1 .....	5	Bact. 1 .....	4	Physiology 4 .....	5
M. S. 1 .....	1	Agron. 6 .....	1	An. Hus. 1 .....	3
	16	M. S. 2 .....	1	M. S. 3 .....	1
		Elective .....	2		17
			16		

## SOPHOMORE

Fall		Winter		Spring	
Chem. 10 or		Agron. 56 .....	4	Chem. 12 or course	
Phys. Sci. 31 .....	5	Chem. 11 or		in Math. or Stat. ...	5
English 10 .....	5	Phys. Sci. 32 .....	5	Veg. Crops or Hort. ...	3
Agr. Econ. 53 .....	3	Agr. Econ. 54 .....	3	Pol. Sci. or Soc. ....	5
Dairy 1 or Poultry 1. .	3	Elective .....	3	Elective .....	3
M. S. 4 .....	1	M. S. 5 .....	1	M. S. 6 .....	1
	17		18	Sec. Sci. 87 .....	1
					18

## JUNIOR

Course	Hours	Course	Hours	Course	Cr.
English 110 .....	4	An. Science .....	3	Agr. Econ. 123 .....	3
Agr. Econ. 120 .....	3	Agr. Econ. 102 .....	3	Agr. Econ. 162 .....	3
Agr. Econ. 121 .....	3	Agr. Econ. 103 .....	2	Agr. Econ. 106 .....	5
Agr. Econ. 104 .....	3	Agr. Econ. 122 .....	3	Irrig. Engr. 10 .....	4
Econ. 165 .....	3	Econ. 107 .....	3	Econ. 108 .....	3
	16	Agr. Econ. 70 .....	3		18
			17		

## SENIOR

Plant Science .....	3	Animal Science .....	3	Agr. Econ. 163 .....	3
Agr. Econ. 230 .....	1	Agr. Econ. 231 .....	1	Agr. Econ. 232 .....	1
Agr. Econ. 240 .....	2	Agr. Econ. 241 .....	2	Agr. Econ. 202 .....	3
Agr. Econ. 112 .....	3	Agr. Econ. 105 .....	3	Agr. Eng. 105 .....	5
Irrig. Eng. 149 .....	3	Agr. Eng. 15 .....	3	Elective .....	5
Agr. Econ. 114 or		Agr. Econ. 115 .....	3		17
116 .....	3	Elective .....	2		
Elective .....	2		17		
	17				

## 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. (3F, W, or S) **Israelsen; Allred**

**54. Principles of Economics.** Emphasis on the application of economic principles to the solution of agricultural problems. (3W, S) **Israelsen**

**55. Principles of Agricultural Economics.** Economic principles and laws underlying agricultural production and distribution; relationships of agriculture to other industries. (3W) **Israelsen; Morrison**

**104. Economic Development of Agriculture.** Geography and use of agricultural resources with special reference to the United States. (3F) **Israelsen**

**230, 231, 232. Public Problems in Agriculture.** Seminar courses to familiarize students with economic implications of problems confronting agriculture. (2F, W, S.) **Thomas**

## Farm Management, Land Economics, and Agricultural Credit

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

**102. Principles of Farm Management.** Principles underlying organization, management, and financial success of farms. Required of all students majoring in School of Agriculture. (3F, W, S) **Blanch, Morrison**

**103. Principles of Farm Management.** Laboratory, Prerequisite: Agr. Econ. 102. (2W, S) **Blanch, Morrison**

**105. Agricultural Credit.** Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. Prerequisite or taken simultaneously: Agr. Econ. 102 (3 W) **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 and 103. (3S) **Blanch**

**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. (not given 1952-53)

### Marketing and Prices

**62. Principles of Marketing.** Principles, methods, and practices of marketing. (5F, W, S) **Morrison; 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 students advanced training and experience in agricultural cooperation. Prerequisite or taken simultaneously: Agr. Econ. 112. (2F) **Thomas**

**114. Marketing Fruits and Vegetables.** Principles of marketing applied to marketing of fruit and vegetables. (not given 1952-53)

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

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

**120. Agricultural Prices.** Economic principles underlying prices. Attention given to 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. (3F) **Israelsen**

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

**123. Statistical Methods.** Advanced analysis and interpretation of statistical data. Prerequisite: Agr. Econ. 121 and 122 (3S) **Israelsen**

**162. Marketing Agricultural Products.** Economic principles underlying the production, demand, and distribution of agricultural products. Required of all students majoring in School of Agriculture. (3F, W, S) **Broadbent; Anderson; Allred**

**163. Advanced Marketing.** Principles of marketing and their applications to specific problems. Prerequisite: Agr. Econ. 62 or 162. (3S) **Broadbent**

### General Graduate Courses

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

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

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

**241. Research Methods and Techniques Applied to the Fields of Farm Management and Land Economics.** Prerequisite: Agr. Econ. 240. (2W) **Blanch**

**242. Research Methods and Techniques Applied to Marketing.** Prerequisite: Agr. Econ. 240. (2S) **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 through any major department in the School of Agriculture. Students planning to do graduate work should select a co-ordinated program of study in the Schools of Agriculture and Education.

## PRESCRIBED COURSE FOR MAJORS IN AGRICULTURAL EDUCATION

### Institutional and General Requirements

Biological Sciences:		Cr. Tot.	Social Sciences:	
*Botany 24 .....	5		*Agr. Econ. 53 .....	3
*Zoology 2 .....	5		*Sociology 10, or 70, or	
Zoology 112 (Genetics) ....	5		*Political Science 10, or	
*Bacteriology 1 & 2, or 70			*History 14 .....	5
& 71 .....	5	<u>20</u>		<u>8</u>
Language and Arts:		Cr. Tot.	Exact Science:	
*Landscape Architecture ....	3		*Chemistry 10, 11, 12 .....	15
*Speech, or Music, or			*Mathematics 34 .....	3
*Art or Literature .....	5	<u>8</u>	Radio 21 .....	4
			Total .....	<u>22</u>
English:				<u>67</u>
Sophomore Composition				
(10) .....	5			
Advanced Composition				
(110) .....	4	<u>9</u>		

\*Courses which meet lower division group requirements.

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

<b>Animal Industry†</b>	<b>Cr. Tot.</b>	<b>Education</b>	<b>Cr. Tot.</b>
An. Hus. 10 .....	5	Education 112, 113, 114,	
Elective .....	15	125, 126 .....	22
<b>Plant Industry†</b>		Psychology 102 .....	5
Agron. 56 (Soils) .....	4	Public Health 155 .....	3
Elective .....	16	Elective .....	3
	20		33
<b>Agricultural Economics</b>		<b>Total Minimum Requirements</b>	
Agr. Econ. 102, 103, 162 ....	8	<b>For B. S. Degree</b>	
Elective .....	3	Institutional and General.....	67
	11	Agriculture .....	80
<b>Agriculture</b>		Education .....	33
Elective .....	9	Military Science & P. E. ....	6
	9		
<b>Agricultural Engineering*</b>		<b>Total</b> .....	186
Irrig. 10 .....	4		
Elective .....	16		
	20		
<b>Total</b> .....	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 receive emphasis. (3F 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**, Associate Professors; **D. R. McAllister**, **Rex Nielsen**, Assistant Professors; **Glenn Baird**, **A. Golden Kilburn**, Extension Agronomists; **J. W. Carlson**, **J. L. Haddock**, **Vern K. Hugie**, **Ovid Lee**, **Wesley Keller**, **C. W. Lauritzen**, **M. W. Pedersen**, **Warren Rasmussen**, **J. P. Thorne**, **F. L. Timmons**, **R. W. Woodward**, 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. Every student who has not had at least one year of farm experience must take Agronomy A, B, and C.

Students planning to participate in crops judging and contest work should take Agronomy 6, 7, 103, 118, and 121 by the end of the junior year, and 124 in fall of senior year. Agronomy 10 is required of all freshmen registered in Agronomy and is recommended for transfer students.

### 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. 1 and 2, or 70 and 71; Ent. 108; Math. 35, 44; Agronomy 6, 7, 8, 56, 103, 107, 111, 112, 113, 118, 155, and either 109 or 114.

### 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 General Agronomy must take: Geol. 3 and 115; Bot. 24, 25 and 120 or 130; Bact. 1 and 2 or 70 and 71; 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.

### 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 requirements 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. 70 and 71; 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. 1 and 2, 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, 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, 120, 121, 131, 132, 155, 160, 165, and 170.

## 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

Freshman		Junior	
Courses	Cr.	Courses	Cr.
Math. 34, 35, 44 .....	11	Agron. 103, 107, 118, 131 .....	14
Bot. 24, 25 .....	10	Bact. 70 and 71 .....	5
Soc. Sci. ....	5	Agr. Econ. 53, 102, 162 .....	9
Lit. or Art .....	5	*Ent. 108 .....	5
Agron. 10, 6, 8 .....	5	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
	50		48
Sophomore		Senior	
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
	45 or 50	*Agr. Ed. 151 .....	3
		Electives .....	10
			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. (1 F,W,S) **McAllister**

**7. Grain Crops.** The classification, history and cultural methods involved in the production of grain crops. Prerequisite: Agron. 6. Three lectures. (3 W 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.** The principles and practices of plant breeding technique and improvement by selection and hybridization. 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 and testing; seed inspection; application of federal standards in the grading of field crops. Two 3-hour labs. (2S) **McAllister**

**124. Advanced Judging, Grading and Identification.** Prerequisites: Agron. 104 and 118. 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. (3F) **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 and 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. (1 F, 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 time 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. 5. Five lectures. (5F or W) **Peterson; Thorne**

**110. Soil Microbiology.** Microorganisms are considered in relation to their role in soil fertility and organic matter decomposition. Also given as Bacteriology 110. Prerequisites: Bact. 1, 2, or 70 and 71; Agron. 56; Organic Chem. Two lectures, one 3-hour lab. (3W) **Stevens**

**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 affect these relationships. Prerequisites: General Soils, General Physics or Chemistry, or approval of the instructor. Three lectures. (3F) **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 (2 S) **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, morphology 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 or to accompany Agron. 165. (2F) **Taylor**

### Special Courses

**A, B, C. Farm Training.** Practical training and experience in common farm operations. Credit not allowed toward graduation. One laboratory per week. (1F, W, S) **Pittman**

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

**111, 112, 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. Prerequisite: Agron. 101. Two lectures. (2S) **Pittman**

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

**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**

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

## 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; **J. R. Harris, D. O. Williamson**, Research 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 numbered 200 and above are designated for graduate students. Courses 110, 120, 125, 150 and 155 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the department chairman.

### SUGGESTED COURSE OF STUDY FOR MAJORS IN ANIMAL HUSBANDRY

Freshman			Sophomore		
Course		Credit	Course		Credit
An. Hus. 1 & 2, 40 .....		6	An. Hus. 10 .....		5
M. S. or P. E. ....		3	M. S. or P. E. ....		3
Math. 34 or 35 .....	3 or 5	5	Chem. 10, 11, 12 or 3, 4, 5 .....		15
Bot. 24 or 25 .....		5	English 10 .....		5
Bact. 1 & 2 .....		5	Zool. 3 & 4, or 2 .....	10 or 5	3
Agr. Econ. 53 .....		3	Hort. or Veg. Crops .....		4
Soc. 10 or 70, or			Agron. 56 .....		3
Pol. Sci. 10 or Hist. 14 .....		5	Language and Arts .....		3
Speech 1 or 5 .....	5 or 3	3	Electives .....	0 to 5	
Vet. Sci. 20 .....		3			
Electives .....		8 to 12			
Total .....		48	Total .....		48

Junior		Senior	
Course	Credit	Course	Credit
An. Hus. 110, 125, 165 .....	9	An. Hus. 150, 155, 160 .....	12
Dairy 109 or 110 .....	3 or 5	Agr. Econ. 116 or 162 .....	3
Agron. 6, 7, 8, or 107 .....	4 or 5	Range Mgt. 160 .....	5
Agr. Econ. 102, 103 .....	5	Agron. 103 .....	4
Vet. Sci. 120 .....	4	Vet. Sci. 140 .....	5
Zool. 112 .....	5	Electives .....	16
English 110 .....	4		
Electives .....	5 to 9		
Total .....	45	Total .....	45

**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) **M. 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 breeding science but who want a general knowledge of reproduction and the breeding principles and their application to larger farm animals. (3F or W) **Bennett**

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

**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) **M. Madsen**

**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**

**115. Horse Production.** Economical production and use of draft and light horses, including breeds, breaking and training, feeding, breeding, housing, handling and marketing. Prerequisite: An. Hus. 10. (2W) **Steffen**

**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. (2W) **Bennett**

**125. Sheep Production.** Range and farm sheep, with emphasis on range production. Methods of production of lambs and wool, grading and marketing practices, feeding and studies of the breeds of sheep and their adaptation to the different husbandry practices. Prerequisite: An. Hus. 10. (3W or S) **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 (4F) **Harris**

**151, 251. Nutritional Diseases.** Cause, detection, treatment and prevention. Prerequisite: An. Hus. 150 (3W) **Harris**

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

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

**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) **Madsen**

**175, 275. 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**

**201. Problems in Animal Breeding.** Special assignments, reports and discussions. Students review literature in various phases of animal breeding, and prepare a comprehensive and critical review of at least one phase of the subject. Prerequisite: An. Hus. 155. (2-6 F, W or S) **Bennett**

**210. Problems in Animal Nutrition.** Same as 201, except study is in animal nutrition. Prerequisites: An. Hus. 150, 151. (2-6 F, 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. 201, except work is in animal production. Prerequisites: An. Hus., 160. (2-6 F, W or S) **Steffen; M. 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; M. 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.) (1 F, 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; **Ann Burns**, Instructor; **John H. Carlquist**, Special Professor; **George C. Chaney**, Special Associate Professor; **Willard J. West**, **Russel S. Frazer**, Special Assistant Professors. Six special staff members from the Cache Valley Medical Association. **W. B. Preston**, Professor Emeritus.

### Bachelor of Science Degree

Bacteriology majors in Specialized Agriculture should take Bacteriology 1 or 70, 71, 104, 110, 160, 191, 192, 193; 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, 180, 191, 192, 193; Botany 24, 25, 130; Chemistry 3, 4, 5, 117 118, 125 126, 191; Mathematics 35, 44; Physics 20, 21, 22; 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 numbered 200 and above are for graduate students. Courses 102, 110, 120, 131, 152, 153, 161, 168 and 180 may be used for credit by graduate majors in Bacteriology. These courses and courses 104, 105, 141, 142, 143, 156 and 160 may be modified and used for credit by graduate students in related departments.

### Bacteriology

**1. Elementary Bacteriology.** Basic concepts and practical applications. (Not open to students who offer credit in Bacteriology 70.) Four lectures. (4 F, W, S, Su) **Smith; Stevens; Jones**

**2. Elementary Bacteriology Laboratory.** Designed for non-technical students. Prerequisite: Previous or concurrent registration in Bact. 1. One 3-hour period weekly. (1 F, W, S, Su)

**3. Bacteriological Demonstration.** Basic fundamentals demonstrated. Prerequisite: Bact. 1. One 1-hour period. (Not offered in 1952-53.)

**70. General Bacteriology.** For majors in science departments. Prerequisite: Chemistry course. (Not open to students who offer credit in Bacteriology 1.) Three lectures. (3 F, W) **Stevens**

**71. General Bacteriology Laboratory.** Designed for technical students. Prerequisite: Previous or concurrent registration in Bact. 1 or 70. Two 3-hour labs. (2F, W) **Stevens; Jones**

**101. Systematic Bacteriology.** Classification relationships. Prerequisite: Bact. 1 or 70. Two lectures (2F) **Smith**

**102. Determinative Bacteriology.** Isolation and identification studies. Prerequisite: Bact. 71. Two 3-hour labs. (2F) **Smith**

**104. Dairy Bacteriology.** Microorganisms of milk and its products. Prerequisite: Bact. 1 or 70. Three lectures. (3 S) **Jones**

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

**110-210. Soil Microbiology.** Relationships of microorganisms to soil fertility. Prerequisite: Bact. 2 or 71. Two 1-hour lectures, one 3-hour lab. (3 W) **Stevens**

**120. Food Microbiology.** (3 W) (Will be offered in 1953-54) **Stevens**

**131. Clinical Laboratory Methods.** Prerequisite: Bact. 2 or 71. (5 F) **Staff**

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

Clinical Bacteriology and Serology	2 months	Carlquist
Clinical Biochemistry	3 months	Carlquist
Clinical Hematology	1 month	Carlquist
Pathological Tissue Methods	2 months	Carlquist
Blood Bank Procedures	2 months	Carlquist
Electrocardiograph and Basal Metabolism Procedures (13 F, W, S)		Carlquist
136. General Pathology Discussions. (2 F)		Carlquist
137. Clinical Laboratory Methods Discussion. (2 W)		Chaney
138. Blood Bank and Blood Serology Techniques. (1 S)		Chaney
139. Pathological Conference. (1 S)		Carlquist
160. Pathogenic Bacteriology. Properties of pathogens and relationships to infectious diseases. Prerequisite: Bact. 71. Three lectures, two labs. (5 W)		Staff
161-261. Advanced Pathogenic Microbiology. Common pathogenic molds, yeasts, and viruses. Prerequisite: Bact. 160. Four lectures, one lab. (5 S)		Staff
168. Immunology. Prerequisite: Bact. 71. Three lectures, two labs. (Will be offered in 1953-54.)		Staff
170. Industrial Bacteriology. (Not offered in 1952-53)		
180-280. Metabolism of Bacteria. Cellular chemistry and physiology. Prerequisite: Bact. 1 or 70, Organic Chemistry. Four lectures. (4 F)		Jones
190. History of Bacteriology. (2F) (Will be offered in 1953-54)		Staff
191, 192, 193. Proseminar. Prerequisites: Bact. 1 or 70 and senior status (1 F, W, S)		Staff
194, 195, 196, 197. Bacteriological Problems. Closely supervised library and/or laboratory work in selected problems. Prerequisite: Two laboratory courses in Bacteriology. Thirty-three clock hours per credit. (1-3 F, W, S, Su)		Staff
291, 292, 293. Seminar. Prerequisite: Graduate status and approval of department. (1 F, W, S)		Staff
294, 295, 296, 297. Advanced Bacteriological Problems. 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 the Cache Valley Medical Association

50. Elementary Public Health. Communicable and non-communicable diseases of general community significance. Functions and organization of health departments. No prerequisites. Three lectures. (3 W, Su) Jones

141. Control of Communicable Diseases. Mechanisms of transmission, prevention and control of the more contagious diseases. Prerequisites: P. H. 50 and Bact. 1 or 70. (3) (Not offered in 1952-53) Smith

142. Non-communicable Diseases of Public Health Significance. Common non-communicable causes of death and disease. Prerequisite: P. H. 50 (3) Staff

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

**Staff**

**152. Air and Water Sanitation.** Biological background; control of air-insect, and water-transmitted diseases. Two lectures. (2W)

**West**

**153. Environmental Sanitation.** Control of rodent, refuse, and food-transmitted diseases; housing, camping, and school sanitation. Two lectures. (2 S)

**West**

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

**Smith; Stevens**

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

**Stevens**

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

**Fraser**

**254, 255, 256, 257. Advanced Public Health Problems.** Special assignments, reports and discussions. Preparation of a comprehensive and critical review. (Time and credit arranged.)

**Smith**

## Botany and Plant Pathology

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

**F. B. Wann**, Professor and Head of Department; **W. S. Boyle**, **George W. Cochran**, Associate Professors; **Arthur H. Holmgren**, Associate Professor and Curator of the Intermountain Herbarium; **Richard J. Shaw**, Instructor; **Orson S. Cannon**, **Bryce N. Wadley** and **George Kaloostian**, 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.

### 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 co-operation 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 valleys and canyons. Wherever possible, plants are studied in their native habitat. Designed to aid teachers in the grades 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 reproductive processes of representatives of the major groups of plants. 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) **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) **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) (Not given 1953) **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. (5 W or S) **Wann**

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

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

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

**135. General Virology.** Biology, physical and chemical properties of viruses. Prerequisites: Bot. 130 or Bact. 160 (3W) **Richards**

**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) **Richards**

**150. Mycology.** Comparative morphology and nuclear behavior of the Phymycetes and the Ascomycetes. Special attention given forms impor-

tant in agriculture, medicine, and industry. Prerequisite: Bot. 25. (4F) **Staff**

**151. Mycology.** Continuation of 150 dealing with the Basidiomycetes and the Fungi Imperfectii. Prerequisite: Bot. 25. (4W) **Staff**

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

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

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

**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. O. Bateman**, **P. B. Larsen**, **Lloyd R. Hunsaker**, Associate Professors; **Lyman 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. **Morris**

**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 grad-

ing of butter under commercial conditions. Quality and composition control are emphasized. (5S) **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**

**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; systems 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 the various breeds of dairy cattle. Visits to important herds. Valuation of dairy cattle. (2S) **Caine**

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

**115 and 215. Seminar.** Discussion and reports of current literature. Any Quarter. Time and credit arranged. **Staff**

**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**

**150 or 250. Special Problems in Dairy Production.** Any quarter. Time and credit arranged. **Hunsaker; Caine**

**154 or 254. Special Problems in Dairy Manufacturing.** Any quarter. Time and credit arranged. **Morris; Larsen**

**216. Research in Dairy Production.** Any quarter. Time and credit arranged. **Caine; Hunsaker**

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

## 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. Junior & Senior	
Math. 34 or 35 .....	3-5	An. Hus. 155 .....	5
Chemistry 10, 11, 12		Dairy 109 .....	3
or 3, 4, 5 .....	15	Dairy 110 .....	5
Dairy 1 .....	3	Dairy 111 .....	2
An. Hus. 1 .....	3	Dairy 112 .....	3
Poultry 1 .....	3	Dairy 115 .....	1
Veg. Crops 1 or Hort. 1 .....	3	Dairy 120 .....	3
Agron. 6, & 7 or 8 .....	4	Chemistry 107 .....	4
Sociology 10 or 70, or		Chemistry 125 .....	5
Political Science 10 .....	5	Bact. 104 .....	3
Speech 1 .....	5	Vet. Sci. 120 .....	4
Dairy 3 .....	3	Agr. Econ. 102 & 162 .....	6
	46-48	Library Science 106 .....	1
		English 110 .....	4
		Pol. Sci. 102 .....	3
		Electives .....	34
			86
Sophomore			
Agr. Econ. 53 .....	3		
Vet. Science 20 .....	5		
Bact. 1 & 2, or 70 & 71 .....	5		
Botany 24 .....	5		
Zoology 2 .....	5		
English 10 .....	5		
Agronomy 56 .....	4		
Dairy 6, 12 .....	8		
Electives .....	5		
	45		

### 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. Junior	
Math. 34 .....	3	Dairy 103 .....	5
Zool 1 or Botany 24 .....	5	Chemistry 107 & 108 .....	8
Language and Arts .....	8	Business Adm. 25 .....	5
Agr. Econ. 53 .....	3	Agr. Econ. 115 or 120 .....	3
Poultry 1 .....	3	Dairy 104 .....	5
Physiology 4 .....	5	English 110 .....	4
Agron. 6, & 7 or 8 .....	4	Agr. Econ. 162 .....	3
Social Science .....	8	Dairy 101 .....	5
Hort. 1 or Veg. Crops 1 .....	3	Bacteriology 104-105 .....	5
P. E. or Military .....	3	Electives .....	6
Electives .....	4		49
	49		
Sophomore		Senior	
Bacteriology 70 & 71 .....	5	Dairy 115 .....	2
Chemistry 10, 11 & 12 .....	15	Dairy 154 .....	6
Dairy 6 .....	5	Library Science 106 .....	1
Speech 5 .....	3	Dairy 105 .....	6
An. Hus. 1 .....	3	Dairy 102 .....	5
English 10 .....	5	Dairy 110 .....	5
Dairy 5 .....	2	Electives .....	25
Electives .....	9		50
P. E. or Military .....	3		
	50		

Suggested electives: Business Administration 63 & 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.

Freshman		Junior	
	Cr.		Cr.
Math. 35 and 44 .....	8	Dairy 115 .....	1
Zool. 1 or Botany 24 .....	5	Chemistry 121 & 122 .....	10
Language & Arts .....	6	Agr. Econ. 115, 162 or 120 .....	3
Poultry 1 .....	3	English 110 .....	4
Physiology 4 .....	5	Social Science .....	10
Hort. 1 or Veg Crops 1 .....	3	Dairy 101 .....	5
Agr. Econ. 53 .....	3	Bacteriology 104-105 .....	5
Agron. 6, & 7 or 8 .....	4	Electives .....	9
An. Hus. 1 .....	3		47
P. E. or Military .....	3		
Electives .....	7		
	50		
Sophomore		Senior	
	Cr.		Cr.
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 .....	5
Dairy 5 .....	2	Electives .....	15
Electives .....	5		45
P. E. or Military .....	3		
	48		

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

## Horticulture

**R. K. Gerber**, Assistant Professor; **Gene H. Oberly**, Extension Horticulturist; **Odeal Kirk**, Superintendent, Howell Field Station.

Students may major in general horticulture, floriculture, or pomology. A suggested course for each major is given below.

### Suggested Course in General Horticulture

Freshman			
Fall		Winter	
Course	Credits	Course	Credits
Math. 34 or 35 .....	3-5	Botany 25 .....	5
P. E. or MST .....	1	Animal Sci. ....	3
Botany 24 .....	5	Veg. Crops 1 .....	1
Agr. Econ. 53 .....	3	Bact. 70 .....	5
Hort. 1 .....	3	P. E. or MST .....	1
	15-17		17
Spring			
Course	Credits	Course	Credits
Botany 30 .....	3		
Animal Science .....	3		
Veg. Crops 2 .....	1		
Hort. 6 .....	3		
P. E. or MST .....	1		
Electives .....	4		
	17		

**Sophomore**

Fall		Winter		Spring	
Course	Credits	Course	Credits	Course	Credits
Chem. 3 or 10 .....	5	Chem. 4 or 11 .....	5	Chem. 5 or 12 .....	5
Social Science .....	5	Lang & Arts .....	5	Agron. 56 .....	4
English 10 .....	5	Hort. 10 .....	4	Hort. 11 .....	3
P. E. or MST .....	1	P. E. or MST .....	1	Electives .....	5
Electives .....	1	Elective .....	2		
	17		17		17

**Junior**

Fall		Winter		Spring	
Course	Credits	Course	Credits	Course	Credits
Hort. 108 .....	3	Botany 120 .....	5	English 110 .....	4
*Hort. 101 .....	3	Zool. 112 .....	5	Botany 130 .....	5
*Hort. 110 .....	1	*Hort. 102 .....	3	Entomology 120 .....	2
Entomology 108 .....	5	*Hort. 111 .....	1	*Hort. 112 .....	1
Electives .....	5	Electives .....	3	Electives .....	5
	17		17		17

**Senior**

Fall		Winter		Spring	
Course	Credits	Course	Credits	Course	Credits
*Hort. 151 .....	4	Veg. Crops 105 or 120 .....	4	*Hort. 115 .....	4
Hort. 153 .....	1	Hort. 154 .....	1	Hort. 155 .....	1
Agr. Econ. 102 .....	3	Agr. Econ. 162 .....	3	Lang. & Arts .....	3
Electives .....	9	Electives .....	9	Electives .....	9
	17		17		17

This major prepares the student for extension service and similar civil service positions, for fruit growing, and field positions with commercial concerns.

**Suggested Course in Floriculture****Freshman**

Fall		Winter		Spring	
Course	Cr.	Course	Cr.	Course	Cr.
Hort. 1 .....	3	Hort. 10 .....	4	Hort. 6 .....	3
Botany 24 .....	5	Botany 25 .....	25	Botany 30 .....	5
Agr. Econ. 53 .....	3	Animal Science .....	3-4	Veg. Crops 2 .....	1
Math. 34 or 35 .....	3-5	Veg. Crops 1 .....	3	Animal Science .....	3
P. E. or MST .....	1	P. E. or MST .....	1	P. E. or MST .....	1
	15-17		16-17	Electives .....	4
					17

**Sophomore**

Fall		Winter		Spring	
Course	Credits	Course	Credits	Course	Credits
Chem. 3 or 10 .....	5	Chem. 4 or 11 .....	5	Chem. 5 or 12 .....	5
English 10 .....	5	L. A. .....	5	Agron. 56 .....	4
Landscape Arch. 3 .....	3	Social Sci. .....	5	L. A. 41 .....	3
Landscape Arch. 40 .....	3	P. E. or MST .....	1	Hort. 11 .....	3
P. E. or MST .....	1	Electives .....	1	P. E. or MST .....	1
	17		17		16

\*These courses taught only in alternate years.

			Junior					
			Fall		Winter		Spring	
Course		Cr.	Course	Cr.	Course	Cr.	Course	Cr.
Bact. 70 & 71	.....	5	Botany 120	.....	5	Botany 130	.....	5
*Hort. 116	.....	3	*Hort. 117	.....	3	Hort. 118	.....	3
Entomology 108	.....	5	Zool. 112	.....	5	Entomology 120	.....	2
Electives	.....	4	Electives	.....	4	English 110	.....	4
		17			17	Electives	.....	3
								17
			Senior					
			Fall		Winter		Spring	
Course		Cr.	Course	Cr.	Course	Cr.	Course	Cr.
*Hort. 119	.....	3	*Hort. 120	.....	3	Hort. 155	.....	1
Hort. 153	.....	1	Hort. 154	.....	1	Agr. Econ. 162	.....	3
Veg. Crops 130	.....	4	Agr. Econ. 102	.....	3	*Hort. 115	.....	4
Chem. 125	.....	5	Chem. 126	.....	5	Electives	.....	9
Electives	.....	4	Electives	.....	5			17
		17			17			

Students electing this major obtain training which prepares them for flower production, retail opportunities, and positions in the floricultural industry.

### Suggested Course in Pomology

			Freshman <sup>1</sup> Sophomore					
			Fall		Winter		Spring	
Course		Cr.	Course	Cr.	Course	Cr.	Course	Cr.
Chem. 3 or 10	.....	5	Chem. 4 or 10	.....	5	Chem. 5 or 12	.....	5
Social Sci.	.....	5	Lang. & Arts	.....	5	Lang. & Arts	.....	3
English 10	.....	5	Hort. 10	.....	4	Agron. 56	.....	4
P. E. or MST	.....	1	P. E. or MST	.....	1	P. E. or MST	.....	1
Electives 1	.....	1	Electives	.....	2	Electives	.....	4
		17			17			17
			Junior					
			Fall		Winter		Spring	
Course		Cr.	Course	Cr.	Course	Cr.	Course	Cr.
Hort. 108	.....	3	Botany 120	.....	5	Botany 130	.....	5
Entomology 108	.....	5	Zoology 112	.....	5	English 110	.....	4
*Hort. 101	.....	3	*Hort. 102	.....	3	*Entom. 120	.....	2
*Hort. 110	.....	1	*Hort. 111	.....	1	*Hort. 112	.....	1
Electives	.....	5	Electives	.....	3	Electives	.....	5
		17			17			17
			Senior					
			Fall		Winter		Spring	
Course		Cr.	Course	Cr.	Course	Cr.	Course	Cr.
*Hort. 151	.....	4	Hort. 154	.....	1	Hort. 153	.....	1
Hort. 153	.....	1	Veg. Crops 105 or 120	.....	4	*Hort. 115	.....	4
Agr. Econ. 102	.....	3	Agr. Econ. 162	.....	3	Electives	.....	12
Chem. 125	.....	5	Chem. 126	.....	5			17
Electives	.....	4	Electives	.....	4			
		17			17			

<sup>1</sup>Freshman year courses are the same as for General Horticulture.

\*Taught only in alternate years.

This major is especially recommended to students who wish to go into fruit production or other branches of the fruit industry.

### Major in Technical Floriculture

Majors in technical floriculture are prepared for graduate study in floriculture and technical employment in flower breeding, and floricultural production. Students having high scholastic standing and special aptitude in the fundamental sciences and who are interested in floriculture will find distinct opportunities in this major.

### Major in Technical Pomology

Students especially interested in Pomology with the same aptitudes and scholastic standing as those interested in floriculture will find opportunities in this major, since it trains them for graduate work and technical employment in fruit breeding, and in fruit production.

A suggested course outline in technical floriculture or technical pomology may be obtained by request from the Department of Horticulture. Admission to this course is by permission of the Head of the Department and the Dean of Agriculture.

### Master of Science Degree

The department offers work towards a Master of Science degree in Horticulture, Floriculture, and Pomology. A year's graduate 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.

Only General Horticulture 1 may be counted to fill the horticultural requirement for students in the various fields of agriculture.

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

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

**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. (4 W) **Staff**

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

**101, 102. Advanced Pomology.** Principles and practices of orcharding. 101, fruit industry, morphology, flower bud formation, orchard sites and soils, cultural practices, harvesting and storage, varieties, propagation and stocks. 102, fertilizers, spraying, pruning and training, winter injury, nutrition, and fruit setting, thinning and alternate bearing, water relations. Hort. 110, 111, 112 are laboratories for these courses and should be taken at the same time. Prerequisites: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 and if possible Hort. 6. (3 F, 3 W) **Gerber**

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

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

**115. Advanced Fruit and Ornamental Plant 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. (4 S) (Not given in 1952-53) **Staff**

**116, 117. Commercial Greenhouse Management.** Principles and practices of commercial greenhouse management. Prerequisites: Hort. 1, 6, 10; Bot. 24, 25. (3 F, 3 W) (Not given in 1952-53) **Staff**

**118. Floral Design.** Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. Prerequisites: Hort. 1, 10. (Not given in 1952-53) **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 florists. Prerequisites: Hort. 119. Alternate years. (3 F, 3 W) **Staff**

**151. Systematic Pomology.** Systematic study of fruits, origin, classification, identification, judging, adaptation. Alternates with 101. (4 F) (Not given in 1952-53) **Staff**

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

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

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

**206. Graduate Conference.** (1 F, W or S) **Staff**

**207. History and Literature of Horticulture.** Origin of horticultural plants and practices. Prehistoric evidences of horticultural operations. Early historic references to arts of gardening. Greek and Roman authors. Development of European and American Literature of Horticulture. (3W) Prerequisite: 20 credits in Horticulture. **Staff**

## 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.

Students spending their first year at a junior college or similar institution should study mathematics through trigonometry, freshman English, sociology and drafting or art.

All students intending to major in the Department of Landscape Architecture and Planning should consult with the head of the Department before registration.

**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. (3 F 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.** The study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. (2F, W, S) **Shiozawa**

**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; **A. B. Stephenson**, Associate Professor; **J. O. Anderson**, Assistant Professor; **Woodrow Jenkins**, 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.

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 101, 102, 104, 127.

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

#### Freshman

Fall		Winter		Spring	
Course	Cr.				
Physiol. 4	5	Bact. 1 & 2	5	A. H. 1	3
P. H. 1 & 2	4	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	3	Elective	2	Elective	2
	16		16		16

#### Sophomore

Fall		Winter		Spring	
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
	16		16		18

#### Junior

Fall		Winter		Spring	
Course	Cr.				
Lib. Sci. 106	1	P. H. 126	1	Agr. Econ. 162	3
Agr. Econ. 102	3	P. H. 107	4	Eng. 110	4
An. Hus. 10	5	Agr. Econ. 115 or		P. H. 104 or 110	2
Zool. 112	5	Agron. 103	4	Vet. Sci. 170 or	
Electives	2	P. H. 105 or 106	3	elec.	3
	16	Elective	4	Elective	3
			16		15

#### Senior

Fall		Winter		Spring	
Course	Cr.				
An. Hus. 150	4	P. H. 126	1	P. H. 105 or 106	3
Physiol. 121	5	P. H. 125	1	P. H. 104 or 110	2 or 1
Entom. 108	5	D. H. 109	3	Agr. Engr. 105	5
Elective	2	Agr. Econ. 115	3	Elective	7
	16	Elective	7		17
			15		

#### Suggested Electives:

Irr. and Dr. 10; Vet. Sci. 140; An. Hus. 151, 155, 185; Agron. 131, 132; Chemistry 90, 125, 126, 190; English 5, 111 (May be substituted for 110, but not taken in addition to it.).

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

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

**3. Turkey Production.** A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small

farm flock or large commercial flock management are emphasized (3W)  
**Draper**

**10. Poultry Practice.** Elementary practice at the poultry yards. Pre-requisite: Poultry 1. (1F, W or S)  
**Staff**

**101. Poultry Production.** Production problems, breeds, judging, selection, feeding and management. (3S)  
**Anderson**

**102. Poultry Production.** Laboratory practice in selection, judging, and other production problems. (1S)  
**Stephenson**

**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)  
**Draper**

**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)  
**Stephenson**

**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: Poult. 1 or 101; Math. 34, and Zool. 112. (3W) (Not given in 1952-53)  
**Stephenson**

**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. (4 W)  
**Anderson**

**110. Poultry Production.** Processing and packaging poultry and poultry products. (1 S)  
**Staff**

**121. Poultry Products.** Concerned primarily with the formation, structure, composition, processing, grading, storage, and distribution of poultry and poultry products. Industrial uses and proper care and handling of poultry by products also receives some consideration. One lab. (1S) **Staff**

**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**

**127. Advanced Poultry Practice.** Special practice at the poultry yards. Prerequisites: Poult. 1, 104 and 107. Time and credit arranged. (F, W or S)  
**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)  
**Stephenson**

**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)  
**Draper**

**260. Animal Industry Seminar, Nutrition.** (1F) **Staff**

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

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

## Vegetable Crops

**L. H. Pollard**, Professor and Head of Department; **E. Milton Andersen**,\* Associate Professor and Extension Specialist; **J. Clark Ballard**, Assistant Professor; **Charles Henry**, Instructor; **M. P. Leonard**, Superintendent Farmington Substation; **L. R. Hawthorn**, Collaborator in Research, U.S.D.A.

In addition to the general college and School of Agriculture requirements, students majoring in Vegetable Crops are required to take Vegetable Crops 1, 2, 100, 102, 105, 120, 121, 130, 161, 162, 163; Horticulture 1, 10, 108; Agronomy 56, 107; Botany 120, 130.

Students who plan to enter graduate study may be admitted to the technical course in Vegetable Crops by permission of the Department Head and the Dean of the School of Agriculture.

The Vegetable Crops Department offers work toward a Master of Science degree in Vegetable Crop Production and Vegetable Breeding. Any course in the department numbered above 100 may be used for graduate credit.

### Suggested Course in Vegetable Crops

Freshman		Junior	
Courses	Cr.	Courses	Cr.
Econ. 53 .....	3	Agr. Econ. 102 .....	3
Vegetable Prod. 1 & 2 .....	4	Agr. Econ. 162 .....	3
Math. 34 & 35 .....	8	Agron. 107 .....	5
Botany 24 & 25 .....	10	Genetics 112 .....	5
Social Sci. ....	5	Eng. 110 .....	4
Gen. Hort. 1 .....	3	Veg. Crops 105 .....	4
Agron. 6 & 7 .....	4	Veg. Crops 130 .....	4
Gen. Bacteriology 1 & 2 .....	5	Hort. 10 .....	4
Gen. An. Hus., 1 & 2 .....	5	Hort. 108 .....	3
P. E. or Mil. Sci. ....	1	Botany 120 .....	5
Electives .....	4	Electives .....	11
	52		51
Sophomore		Senior	
Courses	Cr.	Courses	Cr.
Chemistry 10, 11, 12 or 3, 4, 5 .....	15	Agronomy 109 .....	4
Speech 1 or .....	5	Agronomy 131 & 132 .....	6
Speech 5 .....	3	Agronomy 155 .....	3
English 10 .....	5	Veg. Crops 100 & 102 .....	4
Botany 30 .....	3	Veg. Crops 120 .....	4
Agronomy 56 .....	4	Veg. Crops 121 .....	4
Dairy 1 .....	3	Veg. Crops 161, 162, 163 .....	3
Gen. Poultry 1 & 2 .....	4	Botany 121 .....	3
Landscape Arch. 3 .....	3	Botany 130 .....	5
Geology 3 .....	5	Entomology 108 .....	5
P. E. or Mil. Sci. ....	3	Electives .....	10
Electives .....	4 or 6		51
	57		

### Suggested Electives

Courses	Cr.	Courses	Cr.
Botany 30 .....	5	Horticulture 102 .....	3
Math. 46 .....	5	Vegetable Crops 140 .....	4
Physics 6, 7 or .....	10	Vegetable Crops 160 .....	1-6
Physics 20, 21, 22 .....	15	Photography 63 or 163 .....	5
Horticulture 101 .....	3	Irrigation and Drainage 10 .....	4

\*On Leave

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

**2. 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; Henry**

**100, 102. Vegetable Practice.** Laboratory designed to give students fundamental training in vegetable production (2F, 2S) **Staff**

**105. Major Vegetable Crops.** Classification, identification, origin, history, types, and uses of vegetable crop plants. Special emphasis given crops of major importance in Utah. Alternates with 121. Prerequisite: Veg. Crops 1. (4F) **Pollard**

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

**121. Advanced Vegetable Crops.** Economic, ecological and physiological factors underlying vegetable production, based on study of experimental results. Prerequisites: Veg. Crops 1, 105; Agron. 56, Bot. 120. Alternates with 105. (4W) (Not given in 1952-53) **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 of southern Idaho. (4F) (Given alternate years) (not given 1952-53.) **Pollard; Hawthorn**

**140. Vegetable Processing.** Methods used in the canning, freezing, dehydrating, and pickling of vegetables. Laboratory exercises are conducted in the processing plant at the Farmington Substation. Field trips are taken to commercial plants. Three lectures, one lab. (4F) (Not given in 1952-53) **Pollard**

**160. Special Problems.** Any quarter. Time and credit arranged **Staff**

**161, 162, 163. Seminar.** Discussion of current literature. (1F, 1W 1S) **Staff**

**210. Research and Thesis.** For graduate students taking a major or minor in vegetable crops. Any quarter. One or more credits each quarter. **Staff**

**212. Seminar.** Discussion and reports of current literature. One credit each quarter. **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 120. (3 Arr.) **Pollard**

**221. Advanced Vegetable Problems.** A study of current research as related to important vegetable problems. Prerequisites: Vegetable Crops 1, 105; Agronomy 56; Botany 120. (4W) **Ballard**

## Veterinary Science

\*Wayne Binns, Professor and Head of Department; M. L. Miner, Associate Professor; Paul V. Christofferson, Assistant Professor.

Courses in Veterinary Science 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.

\*On leave

**Pre-Veterinary Training.** Students desiring to study toward a degree in Veterinary Medicine (D.V.M.) must have at least two years of pre-veterinary training at some authorized college or university, with all the basic courses completed. Because of the large number of students in the United States desiring to study veterinary medicine, most students find it necessary to complete three years of pre-veterinary training and in some cases to obtain a Bachelor of Science degree before they are accepted by a veterinary school. All students should take more courses than just the minimum pre-veterinary requirements so that they will have a well-rounded background before starting the technical course. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry will complete the requirements for entrance into a veterinary school, except in schools where additional chemistry, physics, and mathematics may be required. This school does not grant a degree in veterinary medicine. Enrollment in veterinary schools is limited, and students from the state in which the school is located are given preference; therefore, students from the Utah State Agriculture College must be well qualified to be accepted. A suggested three-year pre-veterinary course has been drawn up. Any student wishing to take the prescribed pre-veterinary course and who fulfills the college requirements with a minimum of 141 credits, can, after one year at an accredited veterinary school, obtain a Bachelor of Science degree from this institution. It requires 4 school years to complete the work after an individual has been accepted into a Veterinary school.

**20. Anatomy and Physiology of Domestic Animals.** A study of how the animal's body is constructed and functions. Each system is studied separately; emphasis on the digestive and reproductive systems. 4 lectures, 1 lab. (5F or W) **Binns; Minor**

**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) **Binns; Miner**

**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; Miner**

**170. Poultry Hygiene.** Principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of common diseases affecting poultry in this region. Taught alternate years. (3S) **Miner**

**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 and credit arranged. **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 preveterinary 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; Animal Husbandry 1, 10, 150; Poultry 1, 2; Dairy 1; and English 10, 110.

It is recommended that electives 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**, **G. H. Kelker**, Associate Professors; **Merrill Gunnell**, **Thomas L. Bahler**, Assistant Professors; **Gene H. Linford**, Instructor; **Howard E. Dorst**, **F. V. Lieberman**, **G. E. Bohart**, **H. F. Thornley**, **George H. Kaloostian**, **Walter E. Peay**, **Marshal Levin**, **S. J. Snow**, **William P. Nye**, Collaborators in Research, U.S.D.A.

**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, 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 Advanced Economic Entomology
4 Vertebrate Zoology	115 Medical and Veterinary Entomology
106 Zoological Literature	120 Insect Pollination in Relation to Agriculture
112 Principles of Genetics	156 Chemistry of Insecticides and Fungicides
Entomology 13 General Entomology	
101 Insect Morphology	
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

**B**ESIDES 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, History, Landscape Architecture and Planning, Mathematics, Military Science and Tactics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology, and Physiology.

### SUGGESTED COURSES FOR FILLING GROUP REQUIREMENTS

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

**1. Biological Science:**

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

**2. Exact Science (at least 10 credits):**

Physical Science 31, 32 (in Chemistry, Geology, Mathematics, Physics)

**3. Language and Arts (at least 10 credits):**

English—Any Lower Division Literature course

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

Speech—Any Lower Division course.

**4. Social Science:**

History 4 (World Civilizations) .....5 credits  
and choice of one:

History 5 (World Civilizations) .....5 credits

Pol. Science 1 (Government and the Individual) .....5 credits

Pol. Science 10 (American National Government) .....5 credits

In addition, students are urged to broaden their liberal education by electing courses in Art, Landscape Architecture and Planning, Music, Economics, Psychology, 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				
Zoology 3, 4 .....	5	5	—	German, French or Latin .....	5	5	5
Chem. 3, 4, 5 .....	5	5	5	English 10 .....	—	5	—
Math. 34, 35, 44 or 46 .....	3	5	3	Physics 17, 18, 19 .....	5	5	5
English 40 or 52 .....	—	—	5	Chem 15 or 115 .....	—	—	5
Military Science .....	1	1	1	Electives .....	5	2	2
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 118, 119 .....	—	5	5
English 110 .....	—	—	4
Electives .....	12	7	8
Total .....	17	17	17

Recommended electives are Scientific Vocabulary (Engl. 5), Psychology, Heredity, College Grammar, Technical Writing, History, Political Science, Sociology and Economics.

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

Students interested in a pre-osteopathic program should consult the pre-medical adviser.

## 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

Freshman			
	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

## Sophomore

	F	W	S
Chemistry 121, 122 or 125, 126 .....	5	5	—
Physics 20*, 21*, 22* .....	5	5	5
Zoology 118 .....	—	5	—
English 10, 110 .....	5	—	4
Military Science 4, 5, 6, or P. E. ....	1	1	1
Electives (optional) .....	1	1	12
Total .....	17	17	17

\*A number of schools of dentistry require a minimum of only 9 or 10 credits in physics. Students planning to enter one of these schools may take Physics 6 and 7 instead of Physics 21, 22, and 23; then Mathematics 35 and 44 may be omitted.

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.

## 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 the students take advantage of the instruction in religious philosophy offered to college students 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 firsthand 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. (3F) 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)

**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**

**135. Modern Literary Criticism.** Critical essays since Croce, with particular attention to T. S. Eliot and the modern American School. (4) English 135. **Culmsee**

**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 his 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 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; **Ann Burns**, Instructor; **John H. Carlquist**, Special Professor; **George C. Chaney**, Special Associate Professor; **Russell S. Fraser**, **Willard J. West**, Special Assistant Professors. Six special staff members from the Cache Valley Medical Association.

**W. B. Preston**, Professor Emeritus.

### Bachelor of Science Degree

General Bacteriology majors should take: Bact. 70, 71, 101, 102, 104-105 or 120, 110 or 170, 131, 160, 168, 180, 191, 192, 193; Chemistry 3, 4, 5, 117, 118, 125, 126, 191; Mathematics 35, 44; Physics 20, 21, 22 (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, 101, 102, 131, 160, 161, 168, 191, 192, 193. Chemistry 3, 4, 5, 12, 17, 18, 190, 192; Physiology 20, 21; Physics 6, 7; Public Health 50; Zoology 3, 4, 116, 117; 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. 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 C. David McGuire for further details.)

Health Education Majors should take: Public Health 50, 141, 142, 143, 155, 156; Bacteriology 1, 2; Physical Education 55, 84, 106, 191; 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, 143, 156; Physical Education 84; Social Work 165; plus Electives Public Health 141, 142; Physical Education 155; Foods and Nutrition 5; Psychology 145 or Social Work 162.

Public Health Majors should take: Public Health 50, 141, 142, 143, 152, 153, 155; Bacteriology 1, 2; 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 102,

110, 120, 131, 152, 153, 161, 168, and 180 may be used for credit by graduate majors in Bacteriology. These courses and the following—104, 105, 141, 142, 143, 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

**F. B. Wann**, Professor and Head of Department; **W. S. Boyle**, Associate Professor; **Arthur H. Holmgren**, Associate Professor and Curator of the Intermountain Herbarium; **George W. Cochran**, Associate Research Professor; **Richard J. Shaw**, Instructor; **Bassett Maguire**, Associate Curator New York Botanical Garden, Non-Resident Professor; **Orson S. Cannon**, **Bryce N. Wadley**, **George Kaloostian**, 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 of Botany offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Pathology, Taxonomy, Physiology and Cytology. 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

**Reuben L. Hill**, Professor and Head of Department; **Sherwin Maeser**, **Delbert Greenwood**, **Melvin C. Cannon**, Professors; **Theodore M. Burton**, **Harris O. Van Orden**, Associate Professors; **\*Aubrey W. Lawrence**, Assistant Professor; **Faye Y. Moser**, **Sigrid S. Kennington**, Instructors.

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 student in registering, the following suggested schedule is given.

\*On leave.

## 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

- B. For students who enter college with credit for only 1 unit of algebra and ½ 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 .....	—	—	—
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 .....	7	7	2
Electives in geology, biology, social science, English .....	5	5	10
Total .....	17	17	17

## 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 committee chairman 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

**1. Introductory Chemistry.** A broad view of the cultural aspects of chemistry. This is a terminal survey course and cannot be used as a prerequisite for advanced courses in chemistry. (5F) **Moser**

**2. A laboratory course for nurses to accompany Chemistry 1.** (2F) **Moser**

**3, 4, 5. Chemical Principles and Qualitative Analysis.** Introduction to chemical theory and principles of chemistry, including introductory qualitative analysis in the spring quarter. 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**

**14. Qualitative Analysis.** For students who have completed Chem. 10 and 11 or similar courses and wish to prepare to take Quantitative Analysis. Necessarily duplicates some work given in Chem. 4 and 5. Three lectures, two 3-hr. lab periods. (5 Su) **Maeser**

**Chemistry 15 or 115.** 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**

**17, 18 or 117, 118. Quantitative Analysis.** Theory and practice of gravimetric and volumetric analysis. A terminal course for majors in agriculture and home economics. Prerequisite: Chem. 5 (4F, 4W) **Cannon**

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

**31, 32. Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. (5W, 5S) **Burton**

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

**Maeser**

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

**Hill**

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

**Staff**

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

**Maeser**

**121, 122, 123. Organic Chemistry.** Fundamentals of the chemistry of carbon compounds. Prerequisites: Chem. 5 or a grade of B or higher in Chem. 12. (5F, 5W, 5S)

**Burton**

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

**Burton**

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

**Van Orden**

**132 or 232. Colloidal Chemistry.** Chemistry of colloids and their relationship to the vital processes in plant and animal life: Prerequisite: Chem. 122. A background in Physical Chem. is desirable. (3S)

**Maeser**

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

**Maeser**

**134 or 234. Qualitative Organic Analysis.** The classification, reactions and laboratory work involved in identification of unknown organic compounds. Prerequisites: Chem. 19 and 123. (3S)

**Burton**

**135. Chemical Literature.** Exercises in finding, assembling and using information available in technical publications. (3F) (This course should precede or accompany English 111.)

**Burton**

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

**Maeser**

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

**Burton**

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

**Hill**

**160, 260. Seminar.** (1F, W or S) Time arranged.

**Staff**

**170, 270. Chemical Microscopy.** Lecture and laboratory practice in 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: Physical Chem. or special permission. (2 or more; W)

**Cannon**

**171, 271. Quantitative Micro-Analysis.** Microanalysis of carbon, hydrogen, halogens, sulphur, phosphorous, Kjeldahl and Dumas nitrogen, micro molecular weight determination. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (2 or more)

**Cannon**

**172, 272. Optical Methods of Chemical Analysis.** Problems in spectroscopy, spectrophotometry, colorimetry, refractometry, and microscopy. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3F) **Cannon**

**173, 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. or special permission. (3W) **Cannon**

**174, 274. Advanced Quantitative Analysis.** The analysis of complex substances, such as rocks, minerals, gases, and water supplies. Prerequisite: Chemistry 19 or 119. Time and credit to be arranged. **Cannon**

**90 or 190. Elementary Biochemistry.** The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins, and hormones and their transformations in plants and animals. Prerequisites: Chem. 12 or equivalent. For students not majoring in Chemistry. (5F) **Greenwood**

**189 or 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**

**191 or 291. Biochemistry.** The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins and hormones and their transformations in plants and animals. Prerequisite: Chem. 122 or equivalent. For students majoring in Chemistry, and others having adequate background in Chemistry. (5S) **Greenwood**

**192 or 292. Biochemistry.** Problems in metabolism—micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisite: Chem. 190 or 191 or equivalent. (3F) **Greenwood**

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

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

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

**225, 226, 227. Advanced Organic Chemistry.** Lecture course for graduate students. Includes modern theories and special topics in organic chemistry. Prerequisites: Chem. 123, 106. (2F, 2W, 2S) **Burton**

## English

Wallace J. Vickers, Professor, and Head of Department; King Hendricks, Carlton Culmsee, Hubert W. Smith, Professors; Ira N. Hayward, Wendell M. Keck, Moyle O. Rice, Associate professors; Stanley P. Andersen, John J. Stewart, Maxwell D. Edwards, Assistant Professors; Pearl S. Budge, Veneta Nielsen, Dan H. Ludlow, Blair Hansen, Lynn Mortensen, 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, 118 (or Journalism 112), 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 123, 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 requirements for a minor. English-Speech majors should take English 1, 53, 118, 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 standings in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10 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.** (5F 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) **Staff**

**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 English.** For Forestry, Engineering, and Technology students only. Drill in fundamentals of sentence and paragraph structure. Exercises in grammar, vocabulary, and spelling. Composition, with stress on intelligent thinking and clear expression. (3F, 3W, 3S) **Staff**

**20. Present-day Prose.** The form and substance of current magazine articles, short stories, novels, stageplays and screenplays. (5F or S) **Andersen**

**21. 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**

**23. Literature for Adolescents.** A class designed to acquaint prospective teachers with the literature read in the junior high and high school. (3W) **Rice**

- 24. Children's Literature.** Prose and Poetry of childhood. Helpful to teachers and parents. (3F, W or S) **Mortensen**
- 25. Early Nineteenth Century Novel.** Reading and analysis of the best novels by major English, American, and Continental novelists. (3) **Edwards**
- 26. Late Nineteenth Century Novel.** Reading and analysis of works of novelists of Victorian England and their contemporaries in America and on the Continent. (3F) **Edwards**
- 27. Contemporary Novels.** Reading and interpretation of the best twentieth century novels. (3F, W or S) **Rice; H. Smith; Andersen**
- 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**
- 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, 3S) **Rice**
- 34. Nineteenth Century Short Story.** (3W) **Rice**
- 37. 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**
- 44. Writers in Protest.** Writers who have started new literary trends, resisted conventions, and criticized our own times. (3F) **Rice**
- 45. Readings in Philosophical Literature.** Selected readings in works by great philosophers from Plato to the present. (5W) **Hayward**
- 46. The Bible as English Literature.** Provides an opportunity for first-hand acquaintance with the great book of books. (5S) **Vickers**
- 47. Readings in Greek Literature.** Provides an opportunity to become acquainted with Greek epics and dramas. (5F) **Vickers**
- 51. Masters of Early American Literature.** Principal writers of American literature from Colonial times to Henry David Thoreau. (3W) **Hayward; Smith**
- 52. Masters of Later American Literature.** American Literature from Herman Melville to the present. (3S) **Hayward; Smith**
- 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) **Hayward**
- 57. Whitman and Sandburg.** A study of the attempts of two poet-philosophers to catch the American spirit—one writing with the surge of the frontier, the other writing in its wake. (3S) **Andersen**
- 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) **Hendricks**

**110. Advanced Composition.** For students who have taken English 10 or 11; 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**

**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. (4F, W or S) **Andersen; Keck**

**117. 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. (2F) **Culmsee**

**118. Poetry Workshop.** Direction and criticism for students who wish to write poetry. (2S) **V. Nielsen; Andersen**

**119. Creative Writing.** Short stories, essays, poetry. Considerable freedom of choice as to type. (3F) **Rice**

**124. (See Education 124.) The Teaching of English.**

**134. Literary Criticism.** Masterpieces of criticism for Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4S) **Edwards**

**135. Modern Literary Criticism.** Critical essays since Croce, with particular attention to T. S. Eliot and the modern American School. (4) **Culmsee**

**147. Comparative Literature.** A comparative study of the literature of the 18th century of France and England. (4F) **Hendricks**

**148. Comparative Literature.** A comparative study of the Romantic period in England and Germany. (4W) **Hendricks**

**149. Comparative Literature.** A study of the 19th Century in England, France and Russia. (4S) **Hendricks**

**150. American Poetry.** Development of American poetry as shown through writings of major poets from Philip Freneau to the present. (3) **Hayward**

**151. American Biography and Autobiography.** To introduce American biography and autobiography as an enjoyable and important form of literature and as a source of valuable sidelights on American thought and culture. (3) **Hayward**

**152. 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. (3F) **Smith**

**153. American Drama.** Historical treatment of American drama, with extensive reading of representative plays. (3S) **Smith**

**154. Poe.** The poetry, short stories and literary criticism of Edgar Allan Poe studied in relation to his social and literary theories. (3) **Hayward**

**155. Emerson.** Detailed analysis of his poetry and essays; consideration of his relationship to other major writers in his period. (2F) **Smith**

**156. Hawthorne.** The novels, short stories, and social criticism of Nathaniel Hawthorne as a reflection of the American cultural heritage. (2W) **Hayward**

- 157. Melville.** A study of his fiction as a type of exotic romance, with some consideration of the large amount of critical writing done about him since 1920. (2) **Smith**
- 158. Mark Twain.** Study of his works as a record of a distinctive American culture and as social criticism. (2S) **Smith**
- 159. James.** The novels and short stories of Henry James studied in the light of his literary and social philosophy, and as a reflection of American culture after the Civil War. (2) **Hayward**
- 161. Medieval Literature.** English literature from Beowulf to the Renaissance, exclusive of Chaucer. Emphasis on the epic and 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. (5) **Hendricks**
- 163. Shakespeare.** Six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. (5) **Vickers**
- 164. Elizabethan Playwrights, Exclusive of Shakespeare.** Plays selected from Marlowe, Dekker, Jonson, and others. (4)
- 167. Arthurian Legends.** The legends and their relation to English literature. (3) **Nielsen**
- 168. Modern Drama.** Reading and interpretation of the best plays, Continental, English, and American, from Ibsen to the present. (5S) **Smith**
- 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 1568 to 1660. (5) **Rice**
- 180. The Eighteenth Century.** A comprehensive study of the literature from 1700 to 1798. (5S) **Keck**
- 185. Eighteenth Century Novels.** Major novels by Defoe, Richardson, Fielding, Smollett, Sterne, and Goldsmith. (3) **Keck**
- 186. Restoration Drama.** Principal plays of the Restoration, 1660-1708. (2F) **Keck**
- 187. Eighteenth Century Drama.** Plays and players from the Augustan period until the end of the century. (2) **Keck**
- 188. Great Hymns.** Literature and musical backgrounds of the English hymn. (3S) **Keck**
- 189. Eighteenth Century Poetry.** Poetry and critical theories of composition from the age of Pope until the Romantic period. (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. (5) **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. (5F) **Smith**
- 192. Shelley.** His relation to the Romantic movement. (2S) **Rice**
- 194. Browning.** (2W) **Andersen**
- 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, 52 or 53, 110, 117, or 118 or 119.

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

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.

**1, 2, 3. College Journalism.** For members of Student Life staff. Discussions of paper and responsibilities of journalists are conducted weekly. (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)

**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)

**Stewart**

**112. Writing Feature Articles.** Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals will be made to determine available markets and what editors will buy. (3W)

**Culmsee**

**114. Writing for Radio.** Study and practice in writing information and interpretive continuity for radio programs. (3W)

**Stewart**

**115. Law of the Press.** Law of libel, right of privacy, contempt of court, freedom of the press, copyright, and postal regulation. (2W)

**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. Basic techniques which will aid professional people, extension workers and others to use newspapers, magazines and radio for publicity and information purposes. (3F)

**Stewart**

**124. Public Opinion and Propaganda.** (See Political Science 124.) (3F)

**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)

**Andersen**

**166. Newspaper Practices.** Laboratory work in newspaper plants. (2)

**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)

**B. Hansen and Stewart**

**183. Radio Programming for the Rural Audience.** (See Speech Department for description.) (3W)

**B. Hansen**

**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**, Assistant Professor.

**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.

Geography: 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.

### Courses in Geology

**3. Physical Geology.** Principles of 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. (5 F, W, or S) **Staff**

**4. Historical Geology.** Physical history of the earth, and the development of life as indicated by the geologic record. Prerequisite: Geol. 3. (5W) **Staff**

**5. Minerals, Rocks, and Fossils.** Identification of common minerals, rocks, and fossils. Prerequisite: Geol. 3. (3S) **Staff**

**31, 32. Physical Science.** Principles essential to understanding the physical universe integrated for use in interpreting human experience. (5W, 5S) **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. (5 F) **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) **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) **Hardy**

**106. Invertebrate Paleontology.** Introduction to the study of invertebrate fossils. Methods of preparation. Prerequisites: Geol. 2 and Zool. 3. (5W) **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) **Williams**

**109. Sedimentary Petrography.** Mechanical Analysis. Mechanical analysis of sediments. Statistical representation. Prerequisite: Geol. 101. (3F) **Hardy**

**110. Structural Geology.** Origin and classification of geologic structures. Deformation of the crust of the earth. Prerequisite: Geol. 3. (5F) **Staff**

**111. Petroleum Geology.** Origin and accumulation of petroleum. Sub-surface methods utilized in exploration including a survey of geophysical techniques. Prerequisites: Geol. 108 and 110. (5 S) **Hardy**

**112. Economic Geology: Nonmetals.** Geologic occurrence of coal and other nonmetallic mineral resources. Prerequisites: Geol. 101 and 110. (3W) **Hardy**

**113. Economic Geology: Metals.** Geologic occurrence and distribution of metallic mineral deposits. Prerequisites: Geol. 101 and 110. (5S) **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) **Williams**

**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**

**220. Thesis.** Prerequisite: Graduate standing. (5-15 F, W, or S) **Staff**

### Courses in Geography

**41. Introduction to Geography.** Elements of the natural environment and their relationship to human activities. (5F, W, or S) **Korsok**

**42. Economic Geography.** Commodities of the world and their regional aspects. Economic activities of the principal political divisions of the world. (5F, W, or S) **Korsok**

**104. Physiography of United States.** Physiographic provinces of the United States and their influence on settlement and land use. Prerequisite: Geol. 3 or Geog. 41 or Geog. 42. (2F) **Korsok**

**116. Special Problems.** Directed study of selected problems. Written report required. (1-6 F, W, or S) **Korsok**

**146. Conservation of Natural Resources.** Survey of the natural resources of the United States with an analysis of the methods that may be used for their conservation. Prerequisite: Geog. 41 or Geog. 42. (3W) **Korsok**

**148. Geography of Anglo-America.** Analysis of natural conditions and land use in the economic regions of the United States, Canada, and Alaska. (4F) **Korsok**

**149. Geography of Europe.** Analysis of the physical and economic background of European countries with special emphasis on international and inter-regional commercial and political relationships. (4S) **Korsok**

### History

Joel E. Ricks, Professor, and Head of Department; John Duncan Brite, Professor; S. George Ellsworth, Assistant Professor.

Students who major in History should complete History 1, 2, 13, 14, and thirty additional credits of upper division History selected in con-

ference 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. (5W) **Brite**

**2. Modern European History.** A survey of modern European history from the seventeenth century to the Second World War. (5S) **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. (5 F 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. (3W) **Brite**

**9. Current World Affairs.** An historical inquiry into the evolution and development of the United Nations organization, 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. (5 F or W) **Ricks**

**14. Modern United States History.** Includes 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; Brite; Ellsworth**

**34. English History.** A survey of English history from the earliest times to the present day. (5F) **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. (5W) **Ellsworth**

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

**111. Medieval Economic and Social History.** Economic and social development of the Middle Ages from the thirteenth to the seventeenth century. (3) **Brite**

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

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

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

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

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

### History of the United States

132. **History of the American Frontier.** To the Far West. (3W) 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.** (3F) Ricks
152. **The American Revolution.** The background, philosophy, nature, campaigns and consequences of the American Revolution. (3) 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. (3S) Ellsworth
171. **Constitutional History of the United States.** (5F) Ricks
175. **History of American Democratic Thought.** American democratic thought from the Revolutionary War to the present. (3) Ricks

### Hispanic-American History

161. **Hispanic-America: The Colonial Period.** (3F) Ellsworth
162. **Hispanic-America: The National Period.** (3W) Ellsworth

### Far Eastern History

176. **History of the Far East.** (3S) Ricks

### Graduate Courses

229. **Seminar. Problems in the Industrial Revolution.** (3W) Brite
239. **Seminar in the history of the Mountain West.** (3W) Ellsworth
276. **Selected problems in the Constitutional History of the United States.** (3S) Ricks
292. **Seminar in the Sources and Literature of History.** (3F) Brite
239. **Seminar in the Method and Writing of History.** (3F) 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.**
- 60, 61, 62. **Architectural Design.**
- 130. **Recreational Planning.**
- 140, 141, 142. **Design.**
- 150, 151, 152. **Planting 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.**
- 210. **Advanced Problems.**

## Mathematics

**V. H. Tingey**, Professor and Head of Department; **Neville C. Hunsaker**, Associate Professor; **Mary Nelson**, **Joe Elich**, Assistant Professors; **Joseph K. Everton**, Instructor.

Two types of majors are offered by the Mathematics Department. Students intending to enter graduate study in mathematics take the regular major. Those intending to teach in high schools take the regular major or the teaching major.

Regular majors are required to take mathematics 130, 131, 132 and fifteen additional credit hours of upper division mathematics. Regular majors must have a reading knowledge of either French or German. Physics 20, 21, and 22 and nine credit hours of upper division physics are required. Fifteen credit hours of chemistry are required.

Students expecting to teach mathematics in high school must meet the state requirements for certification in addition to meeting the requirements of a regular major in mathematics. French or German is not required for those expecting to teach.

All students majoring in mathematics must have had plane and solid geometry. **Plane geometry is a prerequisite for all college mathematics.**

### **B. Plane Geometry. (F or W)**

**33. 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. (3W or S)

**118. Modern Algebra.** Prerequisite: 99. (3W)

**119. Theory of Equations.** Prerequisite: 99. (3W)

**120. Modern Geometry.** Prerequisite: 97. (3W)

**121. Projective Geometry.** Prerequisite: 99. (3S)

**122. Ordinary Differential Equations.** Prerequisite: 99. (3F or S)

**123. Number Theory.** Prerequisite: 99. (3S)

**130. Advanced Calculus.** Prerequisite: 100. (3F)

**131. Advanced Calculus.** Prerequisite: 130. (3W)

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)  
 164. **Modern versus Classical Statistical Theory.** (3W)  
 165. **The Theory of Errors and Least Squares.** (3S)  
 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

For students who wish to qualify for a Regular Army or Air Force commission, a department major in Military or Air Science and Tactics is offered through the School of Arts and Sciences. Colleges and universities are now being called upon to provide most of the officer personnel needed for the Regular Army, Marine Corps, and Air Force.

Students desiring to major in Military or Air Science and Tactics are required to major in another academic subject and thereby complete a dual major. The purpose of this is to supply the Army or Air Force with

specialists in all fields for research and other purposes. It is also additional preparation for the student in the event he is not selected or could not qualify for a regular commission.

For those students who are not following a prescribed course as in Engineering or Forestry, the following general subjects are recommended for the prospective Army or Air Force officer:

**Exact Sciences:** Mathematics, Physics, Chemistry.

**Language and Arts:** English, Languages (two years), Speech.

**Social Sciences:** American History, Psychology, Political Science.

For students who desire a dual major in Military or Air Science and Tactics the following majors are recommended, but not required:

**Antiaircraft Artillery:** Chemistry, Mathematics, Modern Languages, Physics, School of Engineering and Technology.

**Ordnance:** Chemistry, Physics, Mathematics, Automotive Technology, Tool Engineering, Industrial Arts Education, Electrical Engineering.

**Quartermaster:** School of Arts and Sciences, School of Agriculture, School of Commerce, School of Forestry.

**USAF Administration:** Business Administration, Physical Education, Secretarial Science, Pre-Medical, Pre-Dental, School of Agriculture, all other majors.

**USAF Air Installations.** Choice of one of the following majors required: Civil Engineering, all other Engineering or Technology, Forestry, Landscape Architecture.

**USAF Communications.** Following majors required: Radio Technology, Electrical Engineering, any other Engineering and Technology.

## 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" are authorized to apply for direct commissions in the Regular Army and Air Force of the United States. Commissions are available to students of this college each year.

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.

See Military and Air Science and Tactics Department, separate section, for course descriptions and other details.

Students who receive reserve commissions in the Army Reserve are authorized to apply for two years' active duty, one year of which will be used as a "Competitive Tour." From each group of reserve officers who enter on the competitive tours, a certain number are given commissions in the regular army.

## Modern Languages and Latin

**George A. Meyer**, Professor and Head of Department; **M. L. Nielsen**, Professor; **Thelma Fogelberg**, Associate Professor; **Aldyth Thain**, Assistant Professor; **Jesse G. Nelson**, **Gordon E. Porter**, Instructors.

**Intensive elementary language courses** are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in 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.

No credit in a beginning language may be used towards graduation until at least 14 credits have been accumulated.

**Major in a modern language:** (Prospective majors are advised to enroll in the intensive courses.)

French: The following courses are required: 1, 2, 3, 101, 102, 105, 110, and twelve credits in courses numbered above 110.

German: Forty-five credits including courses 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

**Language credit by special examination**—Students who have acquired a working knowledge of a foreign language by residence abroad may obtain a maximum of 15 hours of credit in that language by taking a special examination. Such an examination is given only in those languages in which the department has an instructor competent to examine the student. At present, examinations may be taken in French, German, Spanish, Portuguese, Norwegian, Swedish, and Danish.

In addition to the elementary courses regularly listed below, permissible special examination credit is listed as Norwegian 1, 2, 3; Swedish 1, 2, 3; Danish 1, 2, 3.

## FRENCH

**1A. 2A. Elementary French.** Intensive Course. Two hours daily. (7F, 7W) **Meyer**

**1, 2, 3. Elementary French.** (5F, 5W, 5S) **Staff**

**101A. Intermediate French.** Intensive course. (5S) **Meyer**

**102A. Intermediate French.** (5F) **Staff**

**101. Intermediate French.** (5F) **Meyer**

**102. Intermediate French.** (5W) **Thain**

**105. Advanced Composition and Conversation.** (3W) **Fogelberg**

**106, 107, 108. Selective 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.** Study 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, Buffon, 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**  
 102A. Intermediate German. (5F) **Staff**  
 101. Intermediate German. (5F) **Staff**  
 102. Intermediate German. (5W) **Nielsen**  
 105. Advanced Composition and Conversation. (3W) **Staff**  
 106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent, Readings and reports in various 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, Storm, 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's Prose. Werther, Dichtung and Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) **Staff**  
 132. Heine's Poetry and Prose. (3F) **Staff**  
 133. German Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) **Staff**  
 150. 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.** Selected readings from the orations of Cicero and Vergil's Aeneid. Miscellaneous readings from other Roman authors. Open to all students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3S)

**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**

**Roland 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 and Radio Technology, not to exceed 10 credits, may be counted.

**Suggested courses:** The course taken will depend on whether the student wishes to continue with graduate study in physics or whether he desires to teach in high school. The following sequence of courses is recommended for those who wish to continue in graduate study. Students desiring to complete a teaching major in physics in preparation for secondary school teaching, or those desiring to take courses in physics as part of a composite teaching major should consult with the head of the department for specific recommendations. Required professional education courses for the teaching certificate are listed in the School of Education.

**Freshman Year:** Mathematics 35, 46, 97; Chemistry 3, 4, 5; Bacteriology 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; English 110; 5 credits Biological Science; German or French.

**Senior Year:** Physics 153, 154, 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 3 hours of upper division work.

### Master of Science Degree in Physics

Candidates for the degree of Master of Science in Physics must present general physics, general chemistry, calculus, one additional year of mathematics and 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, Soil Physics. If the candidate has fewer than six credits in one or more of these five fields, he may be requested to take additional work in these areas as part of the work for the Master's degree.

### Courses

**1. Household Physics.** Designed primarily for Home Economics Majors. Covers selected topics in Physics of practical importance in the household, with heat and electricity receiving greatest emphasis. Four lectures, one lab. (5W) **Jensen**

**3. Introductory Physics.** A non-technical course designed for students who do not expect to major in sciences but who want a knowledge and understanding of 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 Science majors and Engineers. Prerequisite 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) **Perry**

**20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Sound and Light.** For Science majors and Engineers. Prerequisite: Math. 44 or 46. 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. Physical Science.** Elements of basic physical sciences integrated for use in interpreting human experience. Intended to meet the Physical Science group requirements upon completion of both quarters' work. (5W, 5S) **Staff**

## UPPER DIVISION

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken as early as possible.

**Physical Chemistry.** See Chemistry 104, 105, 106 and Chemistry 109, 110, 111.

**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) **Hart**

**130. Nuclear Physics.** (To follow Physics 121.) A survey of methods and results of recent investigations of nuclear processes. (3S) **Hart**

**140. Biophysics.** Principles of electricity, light, x-rays and radioactivity as related to studies in biology. (5F) **Staff**

**153, 154. Analytical Mechanics.** Prerequisite: Differential Equations. (3W, 3S) **Perry**

**160. Heat.** The nature, transmission, effects, and theories of heat. (3W) **Hart**

**161. Thermodynamics.** A short introduction of thermodynamics. (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 electromagnet 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) **Staff**

**193, 194, 195. Seminar in Physics.** A weekly meeting of staff and physics majors, consisting of reports on recent developments in physics. Students receive credit for course by making reports. 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. X-Ray Diffraction.** (3Arr.) **Staff**

**211. X-Ray Crystallography.** (3Arr.) **Staff**

**220. Atomic Spectra and Atomic Structure.** (5 Arr.) **Staff**

**230, 231. Nuclear Physics.** (3W, 3S) **Staff**

Upon sufficient demand, other courses may be offered.

- 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) (Not given 1951-52) **Perry**
- 290, 291, 292. Theoretical Physics.** (3F, 3W, 3S) **Perry**
- 293, 294, 295. Seminar in Physics.** (1F, 1W, 1S) **Staff**

## Speech and Drama

**Chester J. Meyers**, Professor and Head of Department; **Rex E. Robinson**, **Floyd T. Morgan**, Associate Professors; **Burrell F. Hansen**, **Gwendella Thornley**, Assistant Professors; **George Tanner**, Instructor.

The requirements of forty-five credit hours for a departmental major or a teaching major in Speech are as follows: Speech Foundations (Sp. 8) 2 credits; 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, 8 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 48, 56, 163, 164, 168, 186, 187, or Speech 160, 162, 164 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 first paragraph above.

## Master of Science Degree

The Department of Speech offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Speech science, interpretation, theatre, public address and radio.

The following courses may be modified and used for graduate credit by students majoring in the Speech Department or by students in other departments: 107, 108, 109, 110, 111, 123, 124, 125, 145, 150, 154, 171, 173, 181, 182, 184, 185, 186, 192.

### Courses

**1. Public Speaking.** (Formerly Fundamentals of Speech) Elementary training in Public Speaking. Includes training in daily speaking situations, voice improvement. Clinic assistance available to students who need it. Time for clinical assistance to be arranged. Credit is not given to students who have taken Speech 5. (5F, W or S) **Staff**

**4. Principles of Reading.** 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. Extempore Speech.** 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 articula-

tion, and pronunciation. Recommended for all Speech majors and minors, for prospective teachers, and other courses in public speaking and oral interpretation. (3F) **Staff**

**8. Speech Foundation.** Required of all Speech majors. Not to be taken later than Junior year. This course gives information regarding all phases of speech and drama, and what prospects the fields hold for possible majors and minors. This course surveys acting, directing, and technical work of the theatre, speech correction, radio, oral reading and interpretation, public speaking, and forensics. **Staff**

**9 or 109. Public Discussions.** Application of various group discussion 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**

**11. Speech for Foreign Students.** Designed to help foreign students with conversational vocabulary development. (3F, or S) **Staff**

**12 or 112. Private Instruction.** Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill, and solve individual speech problems. Recommended for everyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged. **Staff**

**13 or 113. Argumentation.** For the student desiring a background of information and practice in techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. Required for credit in Speech 15 or 115, Intercollegiate Debating. (3F) **Robinson**

**15 or 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 13 or 113, Argumentation. (3F, W or S) **Robinson**

**16. Dialect.** The most prominent dialect forms, their principles and uses. The dialect work of such writers as Burns, Kipling, Drummond, Riley, Dunbar, Harris, and Kirk is studied, discussed and learned. (3S) **Myers**

**18 or 118. Story-Telling.** 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) **Meyers**

**20 or 120. Playground Dramatics and Pageantry.** Principles involved in playground dramatics, make-up, pageantry, story-telling, and related activities. **Myers**

**21 or 121. Advanced Public Speaking.** Training in handling special and complex speaking situations. Emphasis on developing skill in speech presentation. Prerequisite: Speech 1 or 5. (3F, W or S) **Robinson**

**24. Oral Interpretation: Lecture and Recital.** Various literary forms are studied for platform presentation. Reading from manuscript and from memory. Preparation and presentation of public recital in reading. (3F) **Myers**

**26 or 126. Make-up.** Straight and character make-up. For Speech and Music majors and minors, MIA workers and prospective teachers. Theory and practice in the art of make-up. (1F) **Staff**

**28 or 128. Make-up.** Nationals: Negro, Oriental, and special problems in make-up. Students should complete 26 or 126 before taking this course. (1S) **Staff**

**30 or 130. Drama Appreciation.** An introduction to the understanding and enjoyment of dramatic literature, radio drama, and moving pictures.

Selected readings of dramatic masterpieces and other contributions to the theatre. **Staff**

**44. Fundamentals of Acting.** Problems of terminology, interpretation of role, and body movement. (3F) **Staff**

**60. Drama Appreciation.** An introduction to the understanding and enjoyment of dramatic literature, radio drama, and moving pictures. Selected readings of dramatic masterpieces and other contributions to the theatre. (5F) **Staff**

**67 or 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. Deals with common speech defects and remedial measures for problems in lisping, indistinct pronunciation, foreign accent, delayed speech, stuttering, and inappropriate use of the voice. Not open to graduate students. (5F) **Staff**

**73 or 173. Speech Clinic.** Application and discussion of methods applied to speech correction in the clinic. Training and practice through the supervised handling of selected cases. Students who have had one quarter of experience are allowed to participate in extension clinics. Prerequisite or corequisite: Speech 167. Consult the instructor for permission to register. Not open to graduate students. Any quarter. Credit arranged. **Staff**

**75. Remedial Speech.** For persons who have a noticeable difficulty with speech, in articulation, quality, pitch intensity, or rhythm. Time arranged. Consult instructor before registering. **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 as a factor in social organization, and to developing appreciation in selection of programs. (Not offered 1952-53)

**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. (3W) **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. (3F) **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**

**106. The Current and Recent Broadway Theatre.** Discussion, lecture, and reading of recent plays presented on Broadway. Analysis of the play, cast, and staging, including professional critical reviews. (2F) **Staff**

**107. Speech Hygiene.** Techniques of normal speech and development of normal and abnormal speech. Major consideration given prevention and correction of speech abnormalities. Primarily designed for elementary school teachers. Recommended for all secondary teachers but does not fulfill the speech pathology requirement for Speech majors. (3W) **Staff**

**108. Interpretation: Scene and Play Reading.** Instruction for readers of plays. Both classics and modern plays are used. **Myers**

**110. Public Programs.** Types of interpretive material suitable for presentation before various kinds of audiences. Reading of short stories, plays, and novels to determine suitability. The cutting of various types of material to suitable form and length for public reading. **Myers**

**111. Psychology of Speech.** Principles of psychology which underlie speech. Problems considered include the nature and origin of speech, lan-

guage in the child, and the psychology of the audience. (3S)

**Staff**

**114. Writing for Radio.** (3S) (See Journalism Division)

**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. Advance 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)

**Morgan**

**152. Drama Production Laboratory.** Four hours per week of crew and staff work on Utah State Theatre productions. (2W)

**Morgan**

**154. Continuation of Speech 152.** (2S)

**Morgan**

**156. The One Act Play.** Study and analysis of selected plays. A course recommended for students who will become community, school, or church drama directors. (2S)

**Morgan**

**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.

**Myers**

**160. Dramatic Structure.** Study and analysis of dramatic structure and technique. For students interested in direction, dramatic literature and playwriting (3W)

**Morgan**

**162. Masterpieces of Drama.** Selected dramas from the Greek period of Ibsen. Plays are analyzed and discussed from points of view of the producer, director, and actor. Not prerequisite to Speech and Drama 164 (3W)

**Morgan**

**164. Masterpieces of Drama and the Theatre.** A continuation of Speech and Drama 162. Selected Continental, British and American dramas from Ibsen to the present (3S)

**Morgan**

**170. Drama Analysis and Theories of the Stage.** For a clear understanding of the theatre's place as an institution, and its responsibilities. Relates theatre to other arts. in a modern world: the relationship of the actor, director, painter, and author to the audience. (3W)

**Staff**

**171. Speech Pathology.** Advanced course in 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**

**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. (5S) **Stewart; B. Hansen**

**183. Rural Radio Programming.** Especially for County Agents, 4-H workers, Home Demonstration Agents, Extension workers and Conservation workers. Analysis and discussions of farm and home needs which radio can serve. Design, writing and production of programs of interest and value to farm listeners. (Not offered in 1952-53) **B. Hansen**

**184. Children's Radio Programming.** Objectives and principles of radio programs for children. Various types of programs for children of different ages are developed, written and produced. (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 Training.** Enrollment limited to students best qualified by training and ability for actual broadcasting experience on a commercial station. Students so qualified are allowed to register for from 3 to 5 credits. Students serve an apprenticeship on a local station under direction of the station staff in executing duties expected of a regular staff employee. Students render three hours service per week at the station for each registered hour of credit. **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 arranged. **Staff**

## GRADUATE COURSES

**200. Seminar in Speech.** 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**

**202. Seminar in Theatre.** Prerequisite: Graduate standing. (2F, W or S) **Morgan, Hansen and Staff**

**203. Seminar in Public Speaking.** Prerequisite: Graduate standing. (2F, W or S) **Robinson and Staff**

**204. Seminar in Interpretation.** Prerequisite: Graduate standing. (2F, W or S) **Myers and Staff**

**205. Seminar in Speech Science.** Prerequisite: Graduate standing. (2F, W or S) **Staff**

**206. Seminar in Radio.** Prerequisite: Graduate standing. (2F, W or S) **B. Hansen and Staff**

**207. Experimental Phonetics.** Prerequisite: Graduate standing. The course presents principles involved in the scientific analysis of speech and voice; describes the major laboratory instruments and techniques in

current use; and familiarizes the student with actual laboratory practice. (3F) **Staff**

**208. Experimental Phonetics.** A continuation of Speech 207. (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) **Staff**

**221. Rhetorical Theory in Public Address.** Consideration of the historical background of theory in public address, beginning with the classical rhetoricians of Greece and Rome. Study of historical development prepares for consideration of earlier and contemporary problems and standards in speech criticism. (3S) **Robinson**

**290. Research Studies.** Advanced research problems 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; **G. F. Knowlton**, Clyde Biddulph, **Eldon J. Gardner**, **William F. Sigler**, Professors; **J. Sedley Stanford**, **G. H. Kelker**, **T. L. Bahler**, 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**, **Walter E. Peay**, **S. J. Snow**, **William P. Nye**, **M. Levin**, Collaborators in Research, U. S. D. A.

**C. J. Sorensen**, Emeritus Professor

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, 113; Entomology 13 and Physiology 121, 122. Also the following courses are recommended: Mathematics 34, 35, 44; Agronomy 131, 132; Chemistry 3, 4, 5, 121, 122; Physics 20, 21, 22; Botany 24, 25; Bacteriology 1, 2 or 70, 71, Geology 1, 2. 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, 112, 116, 127 or 128, 129, 131 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.** Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environment, kinds of living things, reproduction, development, inheritance, and evolution. For lower division students, except those who elect Botany 24, 25, or Zoology 2 or 3 and 4. (5F, W or S) **Gunnell**

**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. For pre-medical and pre-dental students. Forestry (Wildlife) majors, and others who need a more intensive introduction to the animal kingdom. 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**

**106. Zoological Literature.** Literature and bibliographies of zoology and entomology. Each student is assigned, or may choose, a report on the literature of some insect or other animal. Prerequisite: two or more of the fundamental courses required of department majors. (1S) **Stanford**

**107. History of Biology.** The more important men and ideas in the historical development of biology. (3F) **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) **Gardner**

**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: Zool. 111 or 112. (3S) **Gardner**

**116. Parasitology.** Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Prerequisite: Zool. 3. Three lectures, two labs. (5S) **Hammond; 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. Two 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 economics importance are stressed. Two lectures, two labs. (4W) **Stanford**

**123. Natural History of Animals.** The identification, natural history of habits, food, distribution and other features of common Utah animals. Also,

methods of collection and preparation of specimens for study, display and storage. Major consideration given to insects, birds, and mammals. A considerable amount of laboratory time is spent in making observations in the field. Some long field trips are taken. Prerequisite: Zool. 1 or 3 and 4. Two lectures, two labs. (4F) **Stanford**

**127. Cytology.** Introduction to study 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 or more basic courses in biological science. Zool. 111 or 112 recommended. (3W) **Gardner**

**135. Protozoology.** A study of local free-living and parasitic 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**

**160. Animal Ecology.** Distribution and behavior of animals as effected by various environmental factors. Special attention to inter-relationships of biotic communities. Additional assignment to graduate students. (3F) **Kelker**

**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 advance undergraduates. (1F, 1W, 1S) **Staff**

## ENTOMOLOGY

For a major in Entomology, the following courses are required: Zoology 3, 4, 106, 107, 111 or 112, 131; Entomology 13, 100, 101, 103, 109, 115, 120, 156. The following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 24, 25, 30, 130; Range 126; and one basic course in each of the following departments: Agronomy, Horticulture, and Vegetable Crops. For students planning to 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, interrelationships, and life histories of insects. Three lectures, two labs. (5S) **Stanford**

**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) **Levin**

**101. Insect Morphology.** Comparative study of external structure, with emphasis on parts used in taxonomy. Prerequisite: Ent. 13. Two lectures, 2 labs. (4W) **Stanford**

**102. Systematic Entomology.** Students collect, properly mount, and label a representative collection of insects containing at least 400 specimens, 125 species, and 15 orders, arranged in phylogenetic sequence, including a correct placing of all specimens in orders. Prerequisite: Ent. 13. Three labs a week. (3F, W or S) **Knowlton**

**103. Systematic Entomology.** The collection arranged for Ent. 102 must be enlarged to at least 700 specimens, 225 species, 100 families, and 18 orders, including a correct placing of all specimens in families. Prerequisite: Ent. 101. Three labs. (3F, W or S) **Knowlton**

**104. Systematic Entomology.** Permission to take this course depends on the student's collection for 103. A student may select one or two orders and classify them to species. Three labs. (3F, W or S) **Knowlton**

**105. Forest Entomology.** Principal insects attacking forest 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. Primarily for upper division students not majoring in entomology. Three lectures, two labs. (5F or S) **Sorenson**

**111. Anatomy and Physiology of Insects.** Comparative study of internal structure with considerable attention given to function. Prerequisite: Ent. 100. Two lectures, 2 labs. (4S) **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. (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**

**133. Aphidology.** Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 102. (2W) Given in 1953-54. **Knowlton**

**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**

**156. Chemistry of Insecticides and Fungicides.** For course description see Chemistry 156 or 256. (2W) **Hill**

**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. Three credits (F) **Sorenson**

**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) **Knowlton**

**234. Readings in Entomology.** Assigned readings of advanced nature. Credit arranged. (F, W, S) **Staff**

**250. Research and Thesis.** For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Credit arranged. (F, W, S) **Staff**

## PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 115, 116, 117, 121, 122, 123; Zoology 1, 112, 118, 119, 128, 129 and 131; Bio-chemistry 191. Also Mathematics 34, 35 and 44; Physics 20, 21 and 22; Chemistry 3, 4, 5, 17, 18 or 115, 121, 122; 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. For students desiring a more thorough study of human anatomy than is given in Physiology 4. (5W) **Staff**

**115, 116, 117. Current Literature in Physiology.** Current literature in physiology with oral and written reports. (1F, W S) **Biddulph**

**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 a course in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) **Biddulph**

**123. Endocrinology.** The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiol. 4 or Zool. 1, 2, 3 or 4, or Vet. Sci. 20 are recommended. (3S) **Biddulph**

**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**

**231. Cellular Physiology.** Physiology of the animal cell, with emphasis upon mechanisms of synthesis, secretion, and excretion of cellular products. (3S) **Biddulph**

**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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## General Information

**T**HE 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, 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 enable 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.

### Training for Government Service

The Federal Government during recent years has employed increasing numbers of college-trained men and women who are qualified for service in its various departments. In suggesting the following courses, the School of Commerce has attempted to indicate lines of study which will be helpful in preparing for government service. With slight modification, these courses serve equally well to qualify the student for desirable positions outside of government service.

#### Suggested Courses

- I. Accounting:** Acc. 1, 2, 29, 101, 102, 103, 105, 111, 120, 121, 127; Pol. Sci. 129.
- II. Land Economics:** Econ. 28; Econ. 51, 52 or Agri. Econ. 53, 54, 102, 106, 206; Agron. 56; Pol. Sci. 1, 10 and 129; Bus. Ad. 141; Agr. Engineering 108; Geology 3.  
In addition, the student should satisfy the requirements for a major in Agricultural Economics.
- III. Marketing:** Econ. 28, 51, 52 or Agri. Econ. 53, 54, 62, 114, 115, 116, 162, 163; Math. 30, 60, 111.
- IV. Consular and Diplomatic Service:** Pol. Sci. 10, 11, 12, 13, 101, 102, 104, 105, 106, 107, 129; German, French, Portuguese, or Spanish, depending upon the location desired; English 10, 111; Econ. 51, 52, 140, or Agri. Econ. 121, 122, 123.

**V. General Administrative Training:**

Anyone contemplating government service should have an intimate knowledge of the workings of the Federal government and its relationship to industry. To supply that need the following courses are suggested: Pol. Science, 10a, 101, 103, 129, 180, 200; Econ. 125, 147.

**VI. Statistics:** Math. 30, 35, 60 and 111; Econ. 28, 51, 52, 131, 132.

**VII. Secretarial Science:** Sec. Sci. 30, 65, 80, 81, 82, 89, 90, 91, 94, 98, 167, 175, 183, 184, 185, 186, 187; Bus. Ad. 1, 2, 25, 109, 135, 136; Econ. 51, 52, 140; Pol. Sci. 10, 129; Sociology 70.

**VIII. Sociology:**

For Case Work:

Psych. 103a and 103b, 110.

Child Development 60.

Soc. 10, 52, 70, 110, 156, 160, 170, 172, 220.

Soc. 52, 70, 102, 156, 160, 170, 172, 220.

For Social Research:

Math. 34, 35 and 111.

Soc. 70, 202, 220.

Thirty credits of factual courses in the Department.

Field Work under supervision.

**IX. Economics:** Math. 30, 34, 60, 111, Econ. 27, 28, 51, 131; Pol. Sci. 1 or 10; Soc. 70. And the courses listed for those majoring in Economics.

**X. Agricultural Economics:**

The student should satisfy the requirements for a major in this department.

In addition, a thorough preparation should be made in the special fields in which it is desired to work, such as wool, dairying, etc.

## Agricultural Economics and Marketing

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

**G. T. Blanch**, Professor and Head of Department; **D. A. Broadbent**, **V. L. Israelson**, Professors; **R. H. Anderson**, **E. M. Morrison**, Associate Professors; **Wells M. Allred**, Assistant Professor; **Inez B. Tingey**, Research Assistant; **M. H. Taylor**, **Ramon Wilson**, **Leon C. Michaelsen**, Extension Economists; **H. R. Hochmuth**, Collaborator in Research.

**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.

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 graduate from either the School of Agriculture or Commerce. A schedule of this prescribed course may be obtained from the office of the Department of Agricultural Economics.

**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, 103, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122, 162, and 163. Graduate students in other departments may use the same courses for graduate credit, except 122 and 162.

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

### SUGGESTED COURSE OF STUDY FOR STUDENTS MAJORING IN AGRICULTURAL ECONOMICS IN SCHOOL OF COMMERCE

#### FRESHMAN

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Accounting 1 .....	5	Accounting 2 .....	5	Math. 35 .....	5
Speech 1 .....	5	Math. 34 .....	3	English 40 .....	5
Zoology 1 or		English 5 .....	3	Physiology 4 .....	5
Botany 1 .....	5	Bact. 1 .....	4	M. S. 3 .....	1
Soc. Sci. 87 .....	1	M. S. 2 .....	1		
M. S. 1 .....	1				
	<hr/> 17		<hr/> 16		<hr/> 16

#### SOPHOMORE

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Chem. 10 or		Chem. 11 or		Chem. 12, Math,	
Phys. Sci. 31 .....	5	Phys. Sci. 32 .....	5	or Statistics .....	5
English 10 .....	5	Agri. Econ. 54 .....	3	Pol. Sci. 1 .....	5
Agri. Econ. 53 .....	3	Journalism 12 .....	3	Pol. Sci. or	
Animal Husb. 1 .....	3	Agronomy 1 .....	3	Sociology .....	5
M. S. 4 .....	1	M. S. 5 .....	1	M. S. 6 .....	1
	<hr/> 17	Elective .....	2	Elective .....	2
			<hr/> 17		<hr/> 18

#### JUNIOR

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
B. A. 25 .....	5	Agri. Econ. 62 .....	5	Agri. Econ. 162 .....	3
Economics 165 .....	3	Economics 107 .....	3	Economics 108 .....	3
Accounting 101 .....	4	Accounting 102 .....	4	Agri. Econ. 123 .....	3
Agri. Econ. 121 .....	3	Agri. Econ. 122 .....	3	English 110 .....	4
Agri. Econ. 120. ....	3	Agri. Econ. 102 .....	3	B. A. 156 .....	5
	<hr/> 18		<hr/> 18		<hr/> 18

#### SENIOR

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Agri. Econ. 112 .....	3	Agri. Econ. 231 .....	1	Agri. Econ. 232 .....	1
Agri. Econ. 230 .....	1	Agri. Econ. 105 .....	3	Agri. Econ. 242 .....	2
Agri. Econ. 240 .....	2	Agri. Econ. 115 .....	3	Agri. Econ. 163 .....	3
Agri. Econ. 104 .....	3	Plant Science .....	3	Agri. Econ. 113 .....	2
Agri. Econ. 114		Animal Science .....	3	Agri. Econ. 106 .....	5
or 116 .....	3	Elective .....	4	Elective .....	4
B. A. 151 .....	3				
Elective .....	2		<hr/> 17		<hr/> 17
	<hr/> 17				

See "Agricultural Economics" in School of Agriculture for course listings.

## Business Administration

**V. D. Gardner**, Professor and Head of Department; **L. Mark Neuberger**, Professor; **Ina Doty**, **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 and Accounting may concentrate in Accounting, Management, Merchandising, Secretarial Science, and 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

Freshman Year		Sophomore Year	
Course	Cr.	Course	Cr.
Econ. 27-28 .....	6	English 10 .....	5
Econ. 51 .....	5	Econ. 52 .....	5
Soc. 70 .....	5	Math. 34 .....	3
Psych. 53 .....	5	Math. 60 .....	3
Zool. 1 .....	5	Pol. Sci. 11-12-13 .....	9
Bus. Adm. 20 .....	5	Agri. Econ. 62 .....	5
Bus. Adm. 1-2 .....	10	Bus. Adm. 28 .....	5
Bus. Adm. 63 .....	4	Bus. Adm. 59 .....	3
		Bus. Adm. 25 .....	5
		Sec. Sci. 65 .....	3
		Sec. Sci. 86-87 .....	2
Junior Year		Senior Year	
Course	Cr.	Course	Cr.
Bus. Adm. 101-2-3 .....	12	Bus. Adm. 111 .....	5
Econ. 125-6-7 .....	9	Bus. Adm. 107 .....	9
Bus. Adm. 129 .....	3	Bus. Adm. 104 .....	5
Bus. Adm. 140 .....	3	Bus. Adm. 120-21-22 .....	9
Soc. 140 .....	3	Bus. Adm. 126 .....	1
Psy. 161 .....	3	Bus. Adm. 127-128 .....	6
Bus. Adm. 141-142 .....	6	Bus. Adm. 139 .....	3
Bus. Adm. 151-2-3 .....	9	Econ. 131-2 .....	6
Bus. Adm. 155 .....	3	Bus. Adm. 133 .....	5
Psy. 155 .....	3	Bus. Adm. 149 .....	5
Bus. Adm. 156 .....	5	Bus. Adm. 150 .....	5
Bus. Adm. 157 .....	3	Bus. Adm. 154 .....	4
Bus. Adm. 161-2-3 .....	9	Bus. Adm. 160 .....	5
Econ. 145 .....	2	Bus. Adm. 164 .....	4
Econ. 165 .....	3	Sec. Sci. 175 .....	3
Pol. Sci. 104-5-6 .....	9	Econ. 107-8 .....	6
		Econ. 171 .....	3
		Pol. Sci. 107-8 .....	6

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.

## **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. 2:5 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 state. (3S) **Cannon**

**109. Accounting for Non-Commercial Students.** For Engineering, Agriculture, Home Economics, Forestry, and other non-commercial students. (3F, W) **Gardner; Cannon**

**110. Accounting for Non-Commercial Students.** Laboratory optional for those taking Accounting 109. Recommended. (1F, W) **Gardner; Cannon**

**111. Industrial Cost Accounting.** Job costing, process cost accounting, standard costs, estimating cost systems, distribution costs, special considerations. (5W) **Gardner**

**120, 121, 122. Auditing Theory and Practice.** Principles and procedures presented to give practical knowledge of auditing. Prerequisite: A good working knowledge of accounting principles and techniques. (3F, W, S) **Cannon**

**126. Accounting Seminar.** (1F, W, S) **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. (3S) (Not given in 1952-53) **Cannon**

## BUSINESS ADMINISTRATION

**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. (5W or S) **Ellington**

**25. Introductory Business Administration.** Provides a background for the study of the more complex problems of business. Not open to freshmen. Lectures and reports (5F) **Neuberger**

**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. (5S) **Gardner**

**30M. Business Mathematics.** For students in B. A. (3F) **Olsen**

**Commercial Art and Posters.** (See Art 31.)

**Color.** (See Art 32.)

**Psychology of Business and Industry.** (See Psychology 55 and 155.)

**Blueprint Reading and Industrial Drawing.** (See Civil Engineering 59. Required of all sophomore majors in Business Administration.)

**Mathematics of Investment.** (See Math. 60.) Urged for all accounting majors.

**Indexing and Filing.** See Sec. Sci. 65.)

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

**Business Statistics.** (See Economics 131, 132.) Required of all business administration majors. (3F, W) **Cannon**

**133. Industrial Management Problems.** Selected cases are studied for report, problems in industrial location; choice of site; buildings and layouts; selection, purchase, and arrangement of equipment; purchasing of stores; organization; industrial research; labor relations and problems in managerial control. Prerequisite: B. A. 25 or B. A. 20. (5F) **Gardner**

**139. Investment Principles.** Characteristics of bonds and stocks; operation of securities markets; sources of information; interpreting financial news; mathematics of investment; analysis of different types of securities. See Economics 139. (3F) **Loll**

**140. Insurance.** Studied from the standpoint of the consumer of insurance services. Topics treated include: types of life and property insurance contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management and government supervision over insurance companies. **Johnson**

**Social Psychology.** (See Sociology 140 and Psychology 161.) Recommended for all business administration majors.

**141. Real Estate.** For those who will be considering of real estate and of securities based upon real estate. Introduction to real estate contracts, forms, principles, and recent Federal housing legislation. (3W) **G Murray**

**142. Real Estate From Buyer's Point of View.** Factors that determine wise property and home buying: location, financing, and cost in relation to personal income. Offered as a special service to students in Home Economics. (3S) **G. Murray**

**147, 148. Administration of Small Business.** For students in Engineering, Technology, and Agriculture. Attention given factors that determine

whether a business should be started, 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, legal and ethical 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, elements of an accounting system, and problems of cost interpretation. (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 Bus. Adm. majors and accounting majors. **Neuberger**

**Economics of Business Cycles.** (See Econ. 171.) Required of all Bus. Adm. majors.

**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.

**179. Methods of Teaching Typewriting and Bookkeeping.** (3W)

**180. The Teaching of Shorthand.** (3)

**189. Practicum in Business Education.** (1-2F, W or S)

**190. Seminar in Business Education.** (2S)

**191. Problems in Teaching Business Subjects.** (3Su)

**194. Principles and Objectives of Distributive Education.** (3Su)

**195. Part-time Distributive Education.** (3Su)

**200. Research in Business Education.** Credit arranged. (F, W or S)

Students who wish to qualify for a teaching certificate in **General Business** or **Distributive Education** should take the following courses. Students who wish to qualify for a certificate with a major in **Secretarial Science** should refer to the curriculum outlined in that department.

Dept.	No.	Gen'l. Dist.		Dept.	No.	Gen'l. Dist.	
		Bus. Educ.				Bus. Educ.	
Bus. Adm.	1-2	10	10	Bus. Adm.	156		5
Pol. Sci.	11-12-13	9	9	Bus. Adm.	157	3	3
Bus. Adm.	20-25	5	5	Bus. Adm.	161-2-3	9	9
Bus. Adm.	28	5		Psy.	102	5	5
Bus. Adm.	30M	3		Ed.	113	3	3
Econ.	51-52	10	10	Bact.	155	3	3
Bus. Adm.	55		3	Ed.	114	3	3
Bus. Adm.	62	5	5	Ed.	116 or 141	3	3
Bus. Adm.	63		4	Ed.	111	3	
Sec. Sci.	65	3	3	Bus. Adm.	194		3
Econ.	107-108	6	6	Ed.	127	2	2
Econ.	107-132	6	6	Ed.	129-130	10	8
Bus. Adm.	133	5		Psy.	155		3
Bus. Adm.	149	5		Sec. Sci.	179	3	
Bus. Adm.	151-2-3	9		Bus. Adm.	195		3

## MERCHANDISING

**62. 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. Lectures 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. (3S) **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.** Presents 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. (3W) **Johnson**

## Economics

**Evan B. Murray**, Professor and Head of Department; **Leonard J. Arrington**, Associate Professor; **Norman S. Cannon**, **Leo M. Loll, Jr.**, Assistant Professors.

**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 offerings 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**

**27. Economic Development of the United States.** Special attention is given the rise of the American labor movement, development of the monetary and banking systems, evolution of commerce and communication, and the course of American industrial development from the small one-man business to the great corporations. (3W) **Loll**

**28. Economic Geography.** Physical environment and climate and their effects on man and civilization. A survey of world resources, commerce and industry. The factors of location and trade. (3S) **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.** A continuation of Economics 51. Problems of labor, finance, economic instability; international economics, social waste, government control, and world economic systems. Prerequisite to all senior college courses in the School of Commerce except in Agr. Econ. (5F, W or S) **Staff**

**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 Agr. Econ. 53a, 53b. (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 framework 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. Business Statistics.** Application of statistical methods of business problems with attention to graphs, analysis of time series, interpretation of index numbers and the statistics of particular industries and business in general. Prerequisites: Math. 111, Econ 51 and 52. May be used for a major in Bus. Adm. (3F, W) **Cannon**

**135. Transportation Economics.** Emphasizes American railroad transportation, but some attention is given highway and airway transportation. Underlying economic principles receive more attention than practical phases. Special attention given to problems peculiar to the intermountain section. Prerequisites: Econ. 51, 52. (3F) **Arrington**

**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.** Special attention given basic economic relationship between industrial nations, international commerce, farms, and trade restrictions, international debt and finance, and various 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.** The more 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 post-war finance. Special tax problems of Utah. (3W) **Wanlass**

**165. Money, Credit, and Prices.** Structure and operations of money and financial institutions. Special attention given bimetallism, the gold standard, the money market, and the relation of money and credit to prices. Prerequisites: Econ. 51, 52. (3F) **Wanlass**

**170. Economic Development of the West.** Development of agriculture, industry, transportation, and finance in the West. (3) **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. Competition and Monopoly.** History and development of giant corporations; the extent, characteristics, and significance of corporate monopolies and oligopolies; international cartels. Possible public policies; anti-trust activity, co-operatives, government regulation, government operation. (3S) **Wanlass**

**175. Public Utility Economics.** Public utility operations, regulation and problems. The semi-private, semi-public nature of utilities renders them

an especially apt subject for treatment when the question of government ownership vs. government control is considered. Prerequisites: Econ. 51, 52. (3S) **Wanlass**

**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) **Arrington**

**205. Graduate Seminar in Monetary and Banking Theory.** The relation of monetary and banking theories to problems posed by current world difficulties. Open to graduate students and seniors with adequate preparation. (2) **Murray**

**206. Graduate Seminar in Fiscal and Tax Problems.** Problems of attaining economic stability through use of government fiscal policy. Attention focused upon problems that have resulted from World War II. (2) **Loll**

**207. Graduate Seminar on Monopoly and Combination.** American economic society has been characterized by freedom of enterprise and competition, but numerous public and private attempts have been made to control production and marketing and agricultural and industrial commodities. Growth, development, and present status of these control schemes, both domestic and international are traced and appraised. (2) **Arrington**

**209. Graduate Seminar.** Designed to acquaint students with methods of research in economics. A survey of the literature of economic research and practice in the carrying forward of research projects. Prerequisite: permission of instructor. (2) **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; **Asa Bullen**, Professor; **Wendell Anderson**, Assistant Professor; **M. Judd Harmon**, Instructor.

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 or W) **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) **Bullen**

**15. American State and Local Government.** The emphasis is on state, municipal and county or rural governments. It follows Political Science 10. (5S) **Anderson**

**20, 21. Government in the Modern World.** A general study of government designed for students majoring in professional subjects, especially for students in Engineering, Forestry, and Home Economics. Other students may register for this course, but students who register for Political Science 1 should not register for either 20 or 21. Basic features of the American governmental system are discussed in 20; other contemporary political systems are discussed in 21. Students may take either or both quarters without prejudice. (3F, 3W) **Merrill**

**70. Comparative European Governments.** A comparative study of the various forms and kinds of governments that have developed in the modern world with primary attention directed toward Europe. (3S) **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. (3S) **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; 105 and 106 will be given in 1952-53. Prerequisites: Political Science 11, 12, 13. (3F, 3W, 3S) **Bullen**

**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 related organizations as United Nations Educational Scientific and Cultural Organization, World Health Organization, Food and Agricultural Organization, International Labor Organization, and the World Bank and Monetary Fund. (3S) **Anderson**

**117, 118, 119. American Political Thought.** A survey of American political ideas and the men who developed them. The historical approach is used, beginning in colonial times and carrying the development of American political thought through to the present. Emphasis is on ideas that have been significant in shaping the form and actions of American government. Students may register for one, two or three quarters. (2F, 2W, 2S) **Harmon**

**124. Public Opinion and Propaganda.** Open to upper division and graduate students, and to lower division students upon recommendation of departmental instructors. Considers politics in its dynamic aspects. The nature of public opinion and various concepts and techniques of propaganda in domestic and international relations employed by pressure groups, political parties and national states. (3F) **Staff**

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

**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**

**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, with 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**, Assistant Professor; **Floris Olsen**, Instructor; **R. R. Brough**, Special Lecturer.

Students majoring in Secretarial Science must 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.	170	2
Sec. Sci.	69, 70, 71	3	Sec. Sci.	175	3
Sec. Sci.	86, 87, 88	3	Sec. Sci.	183, 184, 185	9
Sec. Sci.	89, 90, 91	3	Sec. Sci.	186, 187	6
Sec. Sci.	94	2	‡Sec. Sci.	179	3
Sec. Sci.	98	2	‡Sec. Sci.	180	3
Sec. Sci.	67-167	2	Sec. Sci.	190	2
Bus. Adm.	30	3	Bus. Adm.	109	4
Bus. Adm.	1, 2	10	Bus. Adm.	Elective	3
Bus. Adm.	25	5	Econ.	Elective	3
Pol. Sci.	11	3	Electives		42

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.

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

#### First Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Biol. Science .....	5	Accounting 1 .....	5	Accounting 2 .....	5
El. Shorthand 75 .....	3	Calculator 94 .....	2	Bus. Communica-	
Typewriting 86 .....	1	El. Shorthand 76 .....	3	tions .....	3
P. E. or M. S. ....	1	Typewriting 87 .....	5	Bank Posting 98 .....	2
Mathematics 30 .....	3	El. Psychology .....	5	El. Shorthand 77 .....	3
Underwood Book-		P. E. or M. S. ....	1	Typewriting 88 .....	1
keeping machine				P. E. or M. S. ....	1
98 .....	2	Total .....	17		
Total .....	15			Total .....	15

#### Second Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Int. Shorthand 80 ....	3	Int. Shorthand 81 ....	3	Sophomore Comp. ..	5
Transcription Prac.		Transcription Prac.		Int. Shorthand 82 ....	3
69 .....	1	70 .....	1	Transcription Prac.	
Adv. Typewriting 89	1	Adv. Typewriting 90	1	71 .....	1
Bus. Adm. 25 .....	5	Economics 51 .....	5	Adv. Typewriting 91	1
Indexing and Filing	3	Pol. Science 12 .....	3	Economics 52 .....	5
Pol. Science 11 .....	3	P. E. or M. S. ....	1	P. E. or M. S. ....	1
P. E. or M. S. ....	1	Electives .....	2	Office Practice .....	2
Total .....	17	Total .....	16	Total .....	18

†These courses count toward filling the group requirements.

‡Required for a teaching certificate.

**30. Business Communications.** Fundamental principles of business letter writing. Practice in writing sales, order, collection, adjustment, and application letters. (3W or S) **Neuberger**

**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, blue-prints, catalogs, and other business forms. (3F, W or S) **Neuberger; Doty**

**67 or 167. Office Practice.** Training in use of dictating and transcribing machines, mimeograph, mimeoscope, and switchboard. Required of students majoring in Secretarial Science and those completing the Two-Year Course. (2F, W or S) **Staff**

**\*69. Transcription Practice.** Designed to develop skill and speed in transcription from shorthand notes. Students must be able to take dictation at not less than 60 words a minute and type a least 40 words a minute. (1F or W) **Doty; Olsen**

**\*70. Transcription Practice.** Continuation of 69. (1W or S) **Doty**

**\*71. Transcription Practice.** Continuation of 70. (1W or S) **Doty**

**75. First-Quarter Shorthand.** For students who have had no previous training in shorthand; includes 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) **Doty; Neuberger**

**87. Second-Quarter Typewriting.** Continuation of 86. Attention given sentence and paragraph practice and letter writing. (1W or S) **Olsen; Doty**

**88. Third-Quarter Typewriting.** Completion of style letters. Training in tabulation, continuity writing, and direct dictation. (1W or S) **Neuberger**

**89. Advanced Business Typewriting.** For students who have had one year of typewriting. Special attention given advanced letter writing, telegrams, invoices, billing, and tabulation. (1F) **Neuberger**

**90. Advanced Legal Typewriting.** Preparation of legal forms and manuscripts. (1W) **Neuberger**

**91. Advanced Secretarial Typewriting.** Work on rough drafts, advanced secretarial problems and Civil Service copy. (1S) **Neuberger**

\*Required of all who register for Intermediate Shorthand 80, 81, 82.

**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) **Neuberger; Olsen**

**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) **Neuberger; Olsen**

**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) **Brough**

**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) **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. (3W) **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. (3) **Neuberger**

**180. Teaching of Shorthand.** Newer methods and trends in teaching shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3W) **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 Science.** Acquaints students with office routines and procedures and gives practice 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) **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) **Neuberger**

**200. Research in Business Education.** For senior and graduate students. Time and credit arranged. (F, W or S) **Neuberger**

## Sociology

**R. Welling Roskelley,\*** Professor and Head of Department, **Don C. Carter**, Assistant Professor and Acting Head; **Joseph N. Symons**, Professor; **Therel R. Black**, **William A. DeHart**, **Carmen Frederickson**, **C. Jay Skidmore**, 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 40 credits in Sociology distributed in the following fields: general and historical, 5 credits; Social Organization, 6 credits; Social Problems, 6 credits; Social Psychology, 3 credits; Social Research and Statistics, 3 credits; Seminar, 4 credits; Cultural Anthropology, 3 credits; electives in Sociology and Social Work, 10 credits. In planning a major in Sociology a student has two options:

1. He may seek a balanced integration into the entire field of Sociology without emphasis in any portion. If this choice is made, specialization is deferred until graduate study.

2. He may, after or concurrently with taking the basic course named above, elect one of the five following fields for emphasis:

**Rural Sociology.** Courses are arranged to give the student special training in rural sociology that will help him function in a professional capacity or as an effective lay citizen. His professional course will qualify him as a teacher, research worker, extension specialist, or as an employee of a governmental or private agency. As a lay citizen he may effectively develop and promote programs for better living. Required: Soc. 130, 154, 156, 187, S. W. 180. Sustaining: Soc. 70, 160, 170; S. W., 173.

**The Family.** Offerings in the field of the family are planned to meet three functions; namely, (1) to contribute to the student's general education, (2) to provide a better foundation for marriage and family living, and (3) to offer professional training in the field of the family—teaching, counseling, adult education, etc. Students who plan to concentrate their studies in the family should gain as broad and intensive a background in the social and biological sciences and the humanities as possible. Required: Soc. 130, 154, 160, 161. S. W. 174. Sustaining: Soc. 156, 170; S. W. 162.

**Crime and Delinquency.** Among the social pathologies within the realm of sociology that gravely concern society are the problems of crime and delinquency. Students interested in these problems are given sound information on amounts, trends, causation, treatment and prevention. For those specializing as school co-ordinators, probation and parole officers, institutional workers, and youth authority employees. Required: Soc. 152, 170; S. W. 162, 182. Sustaining: Soc. 130, 154, 172; S. W. 173, 174.

**Community and Social Organization.** On the professional level, students of community organization serve as teachers, research workers, and extension workers. As lay leaders they co-ordinate and synthesize collective effort in community building. Required: Soc. 130, 152, 156, 160, 170. Sustaining: Soc. 44, 140, 154.

Either Soc. 10 or 70 is prerequisite for all upper division courses in Sociology; also Soc. 40 for 140, and 60 for 160.

\*On leave.

## Social Work

The undergraduate program in Social Work is organized to prepare students for employment in positions in the field for which full professional training is not required. It also provides an educational background for students who may later undertake graduate study. Positions in Utah and surrounding states for which the undergraduate program is intended to offer preparation include those of public assistance workers, counselors in children's institutions, probation officers, and positions in social security agencies. Course requirements for the B. S. degree in Social Work are: 39 credit hours of study, as follows: Social Work: Required: S. W. 165, 173, and 175, plus ten credit hours selected from S. W. 147, 162, 174, 177, 178, 180, 182, and 195. Sociology: 12 credit hours selected from Soc. 110, 140, 141, 160, and 170. Psychology: 6 credit hours selected from Psy. 105, 121, 140, and 183. Psy. 105 required. Related Departments: 4 credit hours selected from: Child Development 67, Pol. Sci. 129, P. E. 83 and Zool. 111.

## 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, 140, 141, 152, 153, 154, 160, 170, 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.** Primarily for foreign students. A limited number of U. S. students admitted. The ways of living of people in the United States are compared with the ways of living in foreign countries from which students come. (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) **Black; Carter; Geddes**

**40. Social Psychology I.** Personality development among different 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**

**44. Women Today.** Progress of women in American society since Colonial days, noting their struggles for status in industry, politics, education, sex, religion, and the arts. Roles and contributions of outstanding women reviewed. (3W) **C. Frederickson**

**52. The Crime Problem.** Broader aspects of crime as a serious contemporary problem: Extent, nature, causes, theories concerning, techniques for coping with, and programs for prevention. (3F) **Symons**

**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 the student's understanding of the social world about him, and how his social experience contributes to his personal development. Sociology 70 or 10 is a prerequisite for all upper division classes in sociology and social work. (5F, W, or S) **DeHart; 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) **Staff**

**110. Utah Social Problems.** Present-day problems in population, migration, housing, insurance, manufacturing, temperance, and safety. (3W) **Geddes**

**130. Introduction to Cultural Anthropology.** Treatment of the attitudes, ideas, behavior, basic personality organization, and material results of selected primitive and contemporary cultures. (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) **Skidmore**

**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) **Geddes**

**152. Organized Crime.** Historical backgrounds and development of organized crime in the U. S.; most organized, and counteracting techniques. Prerequisites: Soc. 52 and 170, or instructor's approval. (3S) **Symons**

**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. (5S) **DeHart**

**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. (3F) **DeHart**

**156-256. 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. (3W) **Geddes**

**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**

**162-262. Instructional Problems in Family Life Education.** Methods, materials, and content for teachers dealing with the social, emotional and cultural phases of Family Life Education. (3) **Skidmore**

**170. Juvenile Delinquency.** Causes are considered with the purpose of arriving at intelligent remedies. Various methods of home, social and institutional treatment are studied; parental co-operation, personal supervision allied with probation and parole, and institutional treatment. Prerequisite: Soc. 52. (3W) **Symons**

**180, 181, 182. Current Sociological Problems.** For upper division and graduate students. (1F, 1W, 1S) **Staff**

**187, 287. Methods of Social Research.** Technique of defining the problem, developing schedules, interviewing and analyzing social data. (3F) **Black**

**190, 191, 192, 193, 194, 195. Seminar in Sociology.** Time arranged. Four quarters required for majors in Sociology. (1F, 1W, 1S) **Staff**

**199. Independent Readings in Sociology.** Readings and conferences on topics selected by the student. (F, W, or S) Credit arranged. **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. 187 or 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**

**207. Graduate Seminar.** Short subjects within the field of Sociology and pertinent to it but not available in regular courses are selected for study. (2W) **Staff**

**210. Advanced Rural Sociology.** 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) **Geddes**

**301. Research Methods in Criminology.** Careful study and analysis of problems, methods, techniques, and outlook involved in criminological research. (3S) **Symons**

## DIVISION OF SOCIAL WORK

**R. W. Roskelley**, Director, on leave; **Don C. Carter**, Assistant Director; **Evelyn H. Lewis**, Assistant Professor, Supervisor of Field Work; Contributing—**Joseph N. Symons**, **Evan B. Murray**, Professors. **Therel R. Black**, **C. Jay Skidmore**, Assistant Professors.

**Joseph A. Geddes**, **W. B. Preston**, Professors Emeritus.

### Social Work Certificate

The undergraduate student may take a bachelor's degree with a major in Social Work. Courses leading to this degree are offered in the Department of Sociology. For description of the undergraduate program, see "Social Work."

The Social Work Certificate is conferred on students who have completed 45 credits of graduate professional courses in Social Work during 3 or more quarters of graduate residence.

Professional Social Work courses open to graduate students working for the Social Work Certificate are:

Course No.	Title	Credits
S. W. 200-1-2	Principles of Social Case Work I, II, III .....	9
S. W. 210-11-12-14	Field Work I, II, III, IV .....	12-14
S. W. 222	Social Work in Rural Communities .....	2
S. W. 230-31	Social Psychiatry I, II .....	4
S. W. 240	Community Organization .....	3
S. W. 250-51	Public Welfare Services I, II .....	6
S. W. 260	Medical Information .....	3
S. W. 270	Child Welfare .....	3
S. W. 275	Principles of Group Work .....	3
S. W. 276	Contemporary Social Work Literature .....	2
S. W. 182, 282	Children in Institutions .....	3
S. W. 187, 287	Research Methods in Sociology and Social Work .....	3
S. W. 295-296	Social Work Seminar .....	2

**147. Social Security.** (See Economics 127.) **Murray**

**162. Mental Hygiene.** Social and cultural changes that have given rise to problems of adjustment. Reactions to stress: "preventive" growth and adaptation. (3W) **Skidmore**

**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) **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) **Carter**

**180. Introduction to Group Work.** Basic philosophy of social group work; its application in group leadership. (2S) **Carter**

**182, 282. Children in Institutions.** Principles underlying care and treatment of children in institutions. Development and trends in institutional care. (3S) **Carter**

**187, 287. Methods of Social Research.** (See Sociology 187, 287.) (3F) **Black**

**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) **Carter**

**196. Social Work Seminar II.** Analysis of behavior causation and motives through use of literature and case studies. Required of majors in Social Work. (1W) **Carter**

**199. Independent Readings in Social Work.** Readings and conferences on topics selected by the student. (F, W, S) Credit arranged. **Staff**

**200. Social Case Work I.** Principles and methods of social case work. Investigation, diagnosis, and treatment. (3F) **Lewis**

**201. Social Case Work II.** A continuation of Social Case Work I. Further application of principles and methods, especially in relation to social case recording and development of skill in relationship. (3W) **Lewis**

**202. Social Case Work III.** Application of case work principles and techniques as affected by agency setting and by special types of client needs. Consideration is given to case work with children, families, aged, and the emotionally or physically ill. (3S) **Lewis**

**210. Field Work I.** Field work centers are maintained in selected public and private agencies; supervision is provided under college direction. (S. W. 200 should precede or be taken concurrently. (2-4 F or W) **Lewis**

**211. Field Work II.** A continuation of Field Work I. S. W. 201 should precede or be taken concurrently. (2-4 W or S) **Lewis**

**212. Field Work III.** A continuation of Field Work II. S. W. 202 should precede or be taken concurrently. (2-8 S) **Lewis**

**214. Field Work in Group Work.** Leadership training and observation of groups in action are available to students who have completed S. W. 275. (2S) **Staff**

**222. Social Work in Rural Communities.** Social work in relation to problems of organization, administration, and community relations as they affect rural counties. (2S) **Staff**

**230. Social Psychiatry I.** Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; interrelation of physical, emotional, mental and environmental factors. (2W) **Staff**

**231. Social Psychiatry II.** An advanced course open only to students who have completed S. W. 230. (2S) **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) **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) **Carter**

**260. Medical Information.** Diseases most frequently encountered in social work. Interrelations of disease and social conditions. Medical resources. (3W) **Preston**

**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**

**275. Principles of Social Group Work.** Characteristics of social group work as a method in social work; consideration of group work process, objectives, and the principles of program development. (2F) **Carter**

**276. Contemporary Social Work Literature.** Reviews current contributions to fields of social work literature and acquaints the student with the periodical literature published during the previous year. (2W) **Staff**

**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. (1-2 S) **Staff**

## SCHOOL OF EDUCATION

E. A. JACOBSEN, Dean

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## 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 expected and urged to register with the bureau to facilitate the compilation of the proper credentials to be used in placement for the current and future years. Registration should be completed 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

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 immediate direction of the departments concerned in selected schools throughout the state and under the general direction 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 special arrangement with district boards of education, the 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; **H. Reuben Reynolds**, Professor; **Jessie Larson**, Associate Professor; **Everett Thorpe**, Assistant Professor; **Warren Wilson**, Instructor.

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 to the entire college, the Art Department is closely correlated with Home Economics, Industrial Arts, Recreation, Landscape Architecture, and other major divisions of the college.

The following courses may be repeated for additional credit: Art 104, 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 below:

**Art Education**

Teaching majors in secondary education are required to complete Art 1, 2, 7, 10, 104, 106, 107, 119, 122, 124, 125, 127, 151; 9 credits in art appreciation; 10 credits in painting, and 10 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, 7, 10, 104, 106, 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, 7, 104, 106, 111, 112, 113, 114, 118, 119, and Woodwork 170.

The following courses are highly recommended: Art 3, 10, 132, 133, 136.

Teaching minors in art should take Art 1, 2, 3, 7, 10, 32, 104, 124, 125, 151; 4 credits in painting, and 4 credits in crafts.

Clothing and Textile majors desiring a teaching minor in Art should complete Art 104, 111, 127, 135, 151, and 6 credits in crafts.

For Elementary Education majors who elect Art as a specialization field, Art 1, 2, 3, 7, 10, 104, 119, 124, 125; and 9 credits in painting are recommended.

**Commercial Art**

Students who choose Commercial Art as a major are required to complete Art 1, 2, 3, 7, 10, 32, 35, 104, 106, 107, 108, 110, 117, 124, 135, 140.

Minors in Commercial Art should take Art 1, 2, 3, 7, 10, 32, 35, 104, 110, 124, 135.

**Crafts**

Majors are required to complete Art 1, 2, 3, 4, 7, 10, 106, 111, 112, 113, 114, 118, 119, 124, 125, 127, Woodwork 61a; 10 credits in 171; Landscape Architecture 20.

Minors are required to complete Art 1, 2, 3, 4, 106, 111, 112, 113, 114, 118, 119.

**General Art**

Students desiring to major in General Art with no specialization or emphasis on teaching are required to complete Art 1, 2, 3, 7, 10, 104, 106, 107, 119, 124, 125, 126, 127, 132, 133, 136, 140, and 10 credits in painting.

**Fashion Design and Illustration**

Majors must complete Art 1, 2, 3, 7, 10, 32, 35, 104, 107, 109, 111, 117, 124, 135; 3 credits in 171; Clothing, Textiles and Related Arts 24, 105, 115, 125, 140.

Minors must complete Art 1, 2, 3, 7, 10, 32, 35, 111, and Clothing Textiles and Related Arts 24, 105, 115, 125.

**Painting**

Major requirements are Art 1, 2, 7, 10, 32, 33, 106, 107, 112, 118, 124, 125, 126, 127, 136, 140; 24 credits in painting technique such as oil, casein, watercolor, etc.

Minor requirements are Art 1, 2, 7, 32, 33, 106, 107, 124, 125, 126, 127, 136; 16 credits in painting techniques such as oil, casein, watercolor, etc.

**Interior Decoration**

Majors are required to take Art 1, 2, 3, 7, 10, 32, 109, 111, 122, 123, 124, 126, 175; Landscape Architecture 3, 20, Clothing Textiles and Related Arts 24, 33; Household Administration 65; Woodwork 170.

Minors must take Art 1, 2, 3, 7, 111, 122, 123, 124, 126, and Landscape Architecture 20.

**Photography**

Students desiring a major in Photography through the Art Department are required to complete Art 1, 2, 7, 10, 32, 108, 109, 117, 129, 130, 131, 131a; Landscape Architecture 20.

Minors are required to complete Art 2, 32, 129, 130, 131, 131a.

### **Sculpture**

Major requirements are Art 1, 2, 3, 7, 10, 33, 106, 107, 112, 118, 124, 125, 126, 127; 12 credits in 171.

Minors should take Art 1, 2, 3, 7, 106, 107, 112, 118, 124, 125, 126; 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 architecture, landscape gardening, interior decoration, sculpture, painting, ceramics and other visible forms of art in everyday life. (3W, S) **Reynolds**

**26, 126. 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. (3F) **Reynolds**

**32, 132. Color.** Color used in stage lighting, painting, design, and everyday life. Physical, psychological, and artistic phases are correlated. Suited to the businessman, layman, dramatist, artist, teacher, and painter alike. (3S) **Reynolds**

**33, 133. History and Appreciation of Painting.** Designed for the layman desiring to extend his knowledge of the great painters before the nineteenth century, as well as for the teachers of art and artists. (3F) **Reynolds**

**36, 136. Development of Modern Art.** Evolution of modern tendencies in art during the nineteenth and twentieth centuries. (3W) **Cornaby**

### **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) **Staff**

**151. 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) **Staff**

**152. 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) **Larson**

### **Commercial Art**

**10, 110. Lettering-Layout.** Design in advertising, display, layout, lettering, etc. (3F, W or S) **Thorpe**

**35, 135. Commercial Illustration.** Fashion design and illustration, advertising. (3F, W or S) **Thorpe**

**117. Commercial Portrait Painting.** Drawing, illustrating and painting of portraits in various media. (3S) **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, brass, pewter and silver, jewelry design and construction, precision casting. (3F, W or S) **Cornaby**

**114. Leathercraft.** Design and construction of wallets, belts, bags, brief-cases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (3F, W or S) **Cornaby**

**118. Plastics.** Creative use of plastics as an ornamental craft. (3W) **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, paper 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) Sections limited to 20 students. **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. 104. 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) **Staff**

**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) **Larson; Wilson**

**45, 145. Rendering Techniques.** Pen and ink, pencil and related techniques. Trains students in scientific drawing, landscaping, architecture and commercial illustration. (3W) **Staff**

**107. Advanced Drawing and Composition.** Continuation of freehand drawing. Prerequisite: Art 7. (3S) **Larson; Wilson**

**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**

**174. Animal Drawing.** For elementary and secondary teachers, art majors, and students in other departments who wish to record their anatomical observations by drawings. (3S) **Staff**

### Graphic Art

**140. Etching.** A study of the unlimited possibilities for creative artistic expression through the use of metal plate as a printing medium. Techniques and uses of the burin, dry-point, soft-ground, hard-ground, aqua-tint, and acid bath in achieving desired effects are emphasized. Desirable preparation: Art 7. (3F, W) **Wilson**

### Interior Decoration

**22, 122. 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**

**23, 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, 122. (4W, S) **Larson**

**175. Advanced Problems in Interior Decoration.** Experimental projects in home furnishing. Prerequisite: 122 and 123. (3S) **Larson**

### Painting

**8, 108. Oil Painting.** Introduction to the use of experimental medium in various techniques. Desirable prerequisite: Art 7. (3F, W, or S) **Larson**

**109. Watercolor Painting.** Modern techniques. Desirable prerequisite: Art 7. (3F, S) **Cornaby**

### 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; Ektachrome 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

**6, 106. Sculpture.** Creative expression in a variety of plastic media, including wood, stone, plaster, clay and metals. 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. A service course for all departments. 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.

From one to five credits a quarter may be taken.

**Sec. 1. Art metal, jewelry, lapidary, precision casting, leathercraft, ornamental plastics, watercolor, Modern Art History.** **Cornaby**

**Sec. 2. Photography, art appreciation, architecture, interior decoration, color, design.** **Reynolds**

**Sec. 3.** Design, interior decoration, drawing, oil painting, fabric design.  
**Reynolds; Larson**

**Sec. 4.** Commercial art, fashion drawing, illustration, portrait painting, design, advertising display, figure drawing, anatomical drawing, painting.  
**Thorpe**

**Sec. 5.** Sculpture, modeling, ceramics, drawing, etching.  
**Wilson**

**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.

**L. R. Humpherys**, Professor Emeritus.

**10. College and Life.** Orientation course for freshmen but open to all students. (2F, W or S) **Staff**

**11. Education.** Restricted to Honor Residents in the dormitories. Various aspects of guidance conducive to helping new students adjust to college life. (2F) **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) **Carlisle 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**

**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 measurement, tests and test construction, statistical analysis, and evaluation procedures in education. (5W) **Staff**

**213. Organization and Administration of Guidance.** Development and evaluation of plans for utilization of school and community resources in guidance. (2 Su. Second) **Jacobsen**

**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 discussed. (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**

**237, 238, 239. 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**

**240. Comparative Education.** Consideration is given to 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 will be utilized as resource persons. (3W) **Oakes**

**251, 252, 253. Master's Essay.** Individual guidance in preparation of research papers as part of research requirement for the Master of Science degree.

**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**

## Education (Elementary)

**Caseel Burke**, Assistant Professor and Chairman; **Edith Shaw**, Assistant Professor; **Ellen Humphrey**, **Fern Nicholes**, **Myrtle Jensen**, **LaRue Parkinson**, **Constance Nielson**, **LaMar Oleson**, **Thomas Taylor**, 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, 181, 182, 183, 123, 145, Physical Education 84, Public Health 155, Speech 107, Child Development 67.
Group II.	Understanding the School—Minimum 6 Credits: Education 103, 114, 116, 141, 201, Psychology 161.

- Group III.** Curriculum and Methods—Minimum 12 credits: Education 104, 105, 107, 108, 109, 161, Psychology 108, 127, English 24, Speech 18 or 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, 211, 219, 221, 237-8-9.

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 objectives, methods of instruction, teaching aids and materials, and sources of information related to the subjects of the curriculum.

**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 to be played by the school and the teacher in helping children meet problems of living. Deals with 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 on 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; **Dale O. Nelson**, **Keith Oakes**, **Helen Cawley**, Assistant Professors; **Pearl S. Budge**, Instructor.

**L. R. Humpherys**, Professor Emeritus.

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, 201.
- (3) Fifteen credits in student teaching, methods and curriculum: Education 111, 127, 129, 130, 107, 108, 115, 161, 162, 164; Art 154; English 123; Speech 123; Secretarial Science 179 or 180; Music 121, 122 or 123; Physical Education 20, 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 present status of the American secondary school. Problems of objectives, curriculum, methods, and pupil personnel are considered. (3F, 3W, 3S) **Carlisle**

**113. Principles of Guidance.** Major emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W or S) **Van Shaar**

**115. Secondary School Curriculum.** The nature and function of the curriculum. Different viewpoints respecting the curriculum, and examples of new type curricula now attracting attention in various parts of this country are evaluated. (3S) **Carlisle**

**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 junior 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**

**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) **Staff**

**179. Methods of Teaching Typewriting.** Recent development and practice in teaching typewriting. For students preparing to teach typewriting 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. Improvement of Teaching in Secondary Schools.** New concepts of method and basic factors affecting learning. Emphasis upon pupil growth, purposing, problem solving, and laboratory techniques in classroom procedure. Attention given to curriculum material. (3F) **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. (3W) **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; Bacteriology 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. (4W or 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 Fall or Winter Quarter and teach a full home-making program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122, preferably at the beginning of her junior year, to make other arrangements for teaching at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W) **Cawley**

**123. Student Teaching in Home Economics for Non-Vocational Education Majors.** For student dietitians whose responsibilities will involve teaching student dietitians, and patients. For other non-vocational homemaking education majors interested in securing practical teaching experience. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4S) **Cawley**

**Field Trip.** For seniors and graduate students enrolled in homemaking education. Trip planned co-operatively by students and homemaking education staff. Trip is usually taken during Spring Quarter, and the estimated cost is given in advance.

**124. Methods of Teaching Farm Mechanics.** Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (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. (4-8 W 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. (3 Su.) First session (First 3 weeks, June 6 to 24). Daily 9-11 **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. (3 Su.) First session (First three weeks, June 6-24). Daily 1-3 **Staff**

**199. Special Problems in Home Economics Education.** Developed around individual needs of students which are not otherwise provided for in curriculum. (1-2 F, W or S) **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 Department of Education leads to the Master of Science degree in Education or to the Five Year Diploma. All courses listed in the department are applicable to either the degree or the diploma with the exception of Education 103, 104, 105, 106, 114, 129, 130.

### Library Science

**King Hendricks**, Professor and Chairman; **Milton Abrams**, Elva Dean, **James Tolman**, Assistant Professors; **George Beutler**, **Ann Caine**, **Pearl Carter**, **Leone Harris**, **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 the instructor. (2 F, W, S) **Smith; Harris**

**100. Reference Materials and Bibliography.** Principal reference tools in each field are studied. Reference materials for school, public, and college libraries are included. (3W) **Smith**

**103. Bibliographic Research in Education.** A study of the technical reference materials, including bibliographies, abstracts, and technical journals, in education. (1F, W) **Logan**

**104. Bibliographic Research in Commerce and Business Administration.** A study of the 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.** A study of the technical reference materials peculiar to Forestry, including indexes, bibliographies, abstracts and technical journals. (1W) **Tolman**

**106. Bibliographic Research in Agriculture.** A study of the technical reference materials peculiar to Agriculture, including indexes, bibliographies, abstracts and technical journals. (1F, S) **Tolman**

**107. Bibliographic Research in Engineering.** A study of the technical reference materials peculiar to Engineering, including indexes, bibliographies, abstracts and technical journals. (1 F or W) **Staff**

**108. Bibliographic Research in Home Economics.** A study of the 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) **Smith**

**121. Second Quarter Cataloging and Classification.** A continuation of Library Science 120, which is prerequisite to this course. (3W) **Dean**

**150. School Library Administration.** The theory of school library work with emphasis on demonstration and practical application. (3S) **Smith**

**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. (1W) **Tolman**

## Music

**N. Woodruff Christiansen**, Professor and Chairman, Instrumental Division; **Walter Welti**, Professor and Chairman, Vocal Division; **John Philip Dalby**, **George Pahtz**, Instructors; **Mischa Poznanski**, Assistant Instructor.

**MUSIC MAJORS.** Music majors may specialize in vocal music, instrumental music, or piano. The following courses are required in all three fields: Basic Music I, 9 credits; Basic Music II, 9 credits; Piano, 4½ credits. Each music major presents or participates in a public recital, or takes a major role in an opera.

Major students, in addition, must complete courses in field selected as shown below:

**VOCAL MUSIC:** Instrumental Methods, 6 credits; School Music Methods, 5 credits; Chorus, 6 quarters; Music History, 3 credits; Conducting, 3 credits; and ability to play third grade piano music at sight.

**INSTRUMENTAL MUSIC:** Consult major professor.

**PIANO.** Six quarters (9 credits) private piano, 6 quarters (9 credits) choral or 3 quarters choral and 3 quarters orchestra or ensemble, Music 80-81, 18 credits basic music, Music 106, 114. Students in piano may elect as major professor the chairman of the vocal division or the chairman of the instrumental division.

**1. The Art of Listening.** Designed to enhance the general listener's appreciation of music through use of selected reproductions. Non-technical collateral reading and reports are assigned. (3F) **Welti**

**3, 4, 5. Fundamentals of Music and Sight Singing.** Notation, scales, intervals and keys in major and minor modes, and their applied use in reading music. (3F, 3W, 3S) **Welti**

**15, 16, 17 or 115, 116, 117. String Ensemble.** Composed of capable string players performing as a group. Music specially arranged for a large string group is used. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Pahtz**

**18, 19, 20, or 118, 119, 120. Symphony Orchestra.** Provides training and practical experience in a wide range of orchestral works including symphonies and the annual opera score. Students below junior standing register for 18, 19, 20. ( $\frac{1}{2}$ F,  $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Christiansen**

**24, 25, 26 or 124, 125, 126. Chorus.** Open to all students with a normal singing voice. Auditions to determine the part you sing are announced at rehearsal. Ladies meet Tuesday, Thursday and Friday. Men meet Monday, Wednesday and Friday. Auditions before registering are required in Winter quarter only. (1F, 2W, 1S) **Welti**

**27, 28, 29. Opera Production.** A practical study of details involved in production of opera. Students enrolled become members of the production staff and are assigned specific tasks in preparation of the opera. (2W) **Welti**

**35, 36, 37. Small Ensembles.** Offers opportunity for good voices to organize into trios, quartets, and other small units. See instructor before registering. (1F, 1W, 1S) **Welti**

**41, Sec. 1, 141. Marching Band.** Open to all students who play band instruments. Rehearsals and drill for presentation of marching shows for athletic events. Attendance at all public appearances of band required. ( $\frac{1}{2}$ F) **Dalby**

**41, Sec. 2, 42, Sec. 2, 43, Sec. 2. 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**

**42, 142, Sec. 1, 43, 143, Sec. 1. Symphonic Band.** Study and preparation of modern symphonic band literature. Public performances and concerts. Permission to register must be obtained from instructor. ( $\frac{1}{2}$ W,  $\frac{1}{2}$ S) **Dalby**

**44, 45, 46 or 144, 145, 146. Brass and Reed Groups.** 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, 76. Basic Music I. Diatonic harmony.** Chord progressions and melody writing up to and including seventh chords. Form and analysis. (3F, 3W, 3S) **Christiansen**

**77. Keyboard Harmony.** Application at the keyboard of basic harmonic principles. Harmonization and transposition of simple folk tunes and children's song. Elementary improvisation. Prerequisite or parallel, Basic Music I. (2F, 2W, 2S) **Christiansen**

**\*80. Opera Appreciation.** Intensive study is made of the world's best operas. Particular attention is given to development of the orchestra as an essential part 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. Careful study is made of their form and content. Biographical sketches of composers. (2W) **Christiansen**

**84, 85, 86 or 184, 185, 186. String Groups.** Offers opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Standard literature is studied. ( $\frac{1}{2}$ -1F,  $\frac{1}{2}$ -1W,  $\frac{1}{2}$ -1S) **Pahtz**

**88. Composition.** Study of simple homophonic forms in original compositions. Prerequisite: Basic I. (2W) **Dalby**

**89. Composition.** More advanced work in musical composition. Study and use of larger forms. Prerequisite: Music 88. (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**

**101, 102, 103. Band and Orchestra Instruments.** An individual study of assigned instruments with performance examinations. Required of all instrumental majors. Prerequisite: Music 121, 122, 123, (2F, 2W, 2S) **Dalby**

**106. History of Music.** The development of music from its varied inception to the present. Lives of the most prominent composers. Effects of history on the development of music. (3S) **Welti**

**114. Techniques of Conducting.** The art and technique of effectively selecting, organizing and conducting group music. Style in expression. Use of the baton. Not open to freshmen. (3S) **Welti**

**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 instruments. (3F, 3W, 3S) **Dalby; Poznanski**

**127, 128, 129. Opera Staging.** Open only to the opera cast and their understudies. Selections are made in the fall through competitive tryouts open to all students. Intensive study and rehearsing begin immediately after these selections are completed. (3W) **Welti**

**131, 132. School Music Methods.** One year of Basic Music, or one year of Sight Singing must be completed before any student is allowed upper division credit. Fall quarter is given to methods in nursery school and lower grades; Winter quarter to upper grades; Spring quarter to high school. (5W, 5S) **Odd**

**135, 136, 137. Vocal Ensemble.** Open only to members of the small choruses. Membership in these choruses is limited and competitive. Application may be made at any time, but additions are announced only as vacancies occur. A good voice and ability to read music are required. (1F, 1W, 1S) **Welti**

**170, 171. Instrumentation and Arranging.** Study of each of the standard instruments in use today, their use in small ensembles and large heterogeneous groups. Scoring and arranging for band and orchestra. (3W, 3S) **Dalby**

**173, 174, 175. Score Reading.** A course designed for all who expect to direct instrumental music, concentrating on the technique of reading scores. Practical application with performing groups. Recommended prerequisite: Music 114. (1F, 1W, 1S) **Christiansen**

\*Language Arts Group.

**177, 178, 179. Basic Music II.** Fall and winter, chromatic harmony. The study of chord embellishments. Analysis of corresponding musical literature. Composition in small forms. Spring, counterpoint; study of sixteenth century style and its application. (3F, 3W, 3S) **Christiansen**

**188, 189. Composition.** Continued study in composition for advanced students. Writing for large vocal and instrumental groups. Prerequisite: Music 89, 170 or 171. (2W, 2S) **Dalby**

### PRIVATE INSTRUCTION COURSES

**N. Woodruff Christiansen**, violin, band and orchestra instruments; **Walter Welti**, vocal; **George Pahitz**, cello: INSTRUCTORS—**Lucy L. Christiansen**, piano; **S. E. Clark**, piano and organ; **John P. Dalby**, **Max Dalby**, Brass and Woodwind instruments; **Maxine Greenwood**, vocal; **Thelma Lundquist**, piano; **Laverne Odd**, piano; **Mischa Poznanski**, violin; **Patience Thatcher**, vocal; **Eldon Torbensen**, brass instruments; **Jeanne T. Welti**, piano; **Irving Wassermann**, piano.

The following courses are given through private study only. Appointments must be arranged with the instructor whom you select. For fees see "Student Fees."

NOTE: Students taking one lesson a week in any private music study, and getting the required amount of practice and preparation, shall register for one and one-half credits per quarter. Students taking two lessons and getting the required amount of practice and preparation shall register for three credits per quarter. Upper division credit is given students of junior standing provided they have had at least two years, or equivalent, of previous study.

50P, 51P, 52P, 150P, 151P, 152P. 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, 57P, 58P, 156P, 157P, 158P. Wind Instruments. See statement for piano. **Staff**

60P, 61P, 62P, 160P, 161P, 162P. Violin. See statement for piano. **Staff**

63P, 64P, 65P, 163P, 164P, 165P. Cello. See statement for piano. **Pahitz**

66P, 67P, 68P, 166P, 167P, 168P. Pipe Organ. See statement for piano. **Clark**

### Physical Education and Recreation

**H. B. Hunsaker**, Professor and Head of Department; **W. B. Preston**, Professor; **Israel Heaton**, Associate Professor; **Dale O. Nelson**, **Lois Downs**, **Vaughn Gordon**, Assistant Professors; **Ray Watters**, **Pauline Fuller**, **Helen Clark**, Instructors.

### INTERCOLLEGIATE ATHLETIC STAFF

**Joseph E. Whitesides**, Assistant Professor, Director of Athletics; **John Ronning**, Professor; **Everette Faunce**, **Calvin C. Stoll**, **Ralph Maughan**, Assistant Professors; **George Nelson**, **Gordon Porter**, Instructors.

### SERVICE COURSES

In the service courses of this department, 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 intended 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 social dancing.

### **Professional Study in Health, Physical Education and Recreation**

The Department of Physical Education and Recreation offers major study with specialization in the following subjects: Physical Education, Dance, Elementary Physical Education, Secondary Physical Education, Recreation and Health. It is recommended that in many study programs it would be desirable that a composite study program involving two of the above programs be selected to meet the major, minor requirements. In such programs, approximately 35 credit hours should be selected in each division.

### **Study Leading to the B.S. Degree**

Majors or minors in the Department of Physical Education and Recreation fulfill the basic physical education requirement by completing the fundamental sports courses, Physical Education 20, 21, 22, 30, 31, 32, or 94, 95, 96, 97, 98, 99, in lieu of the 6 credits required for graduation, except that majors or minors in Dance complete P. E. 24, 25, 26, 77, 78, 79.

Teaching Majors in Elementary Schools must complete Physical Educa-

tion 24, 25, 26, 81, 84, 85 or 92, 104, 177, 180 or 181, 182, 183, 191; six credits in Sports Techniques and 11 credits from the following: 55, 86, 87, 111, 112, 150, 184, 192.

Teaching Majors in Secondary Physical Education must complete the following courses: P. E. 25, 75, 83, 84, 106, 183, 184, 191, and 10 credits in Technique of Sports. In addition, women must complete 24, 26, 77, 78, 79, 81, 92, 150, 180. Men must complete 3, 85, 181, 188, 189, 190. Suggested Electives: 55, 86, 87. Education prerequisites: 120 or 160 and 192.

Teaching Majors in Dance must complete Physical Education 72, 76, 81, 83, 84, 102, 103, 104, 106, 111, 140, 150, 151, 153, 180, 183, 184, 192; Speech 20 or 120, 150; Textiles 105.

To meet the needs of the secondary school, a composite major of physical education and dance is highly desirable. The following courses must be completed:

Physical Education 24, 25, 26, 77, 78, 79, 72 or 76, 81, 83, 75, 84, 92, 164, 106, 102, or 103, 104 111 150 183 151, 184, 192, (160, 161, 162, 163, 165—select three of this group 160 thru 165), 180, speech 20.

Physical education 94, 95, 96, 97, 98, 99 satisfy the graduation requirements in Physical Education and 160 and 192 are used as Secondary Education Certificate requirements.

To meet the needs of the Secondary School or Composite Major of Dance and Physical Education is highly desirable with the following courses applying to the Dance credits: Physical Education 72 or 76, 81, 83, 102, 103, 104, 111, 150; Speech 20, and thirty credits selected from the following in Physical Education: 75, 84, 92, 106, 161, 162, 163, 164, 165, 180, 183, and 184. Physical Education 94, 95, 96, 97, 98 and 99 satisfy the graduation requirements in Physical Education and Physical Education 160 and 192 are used as Secondary Education Certification Requirements.

Majors in Recreation must complete 3, 25, 75, 83, 84, 85, 153, 179, 183, 196; 6 credits Sports Techniques, 6 credits Sociology, 10 credits related fields of arts, crafts, music, dramatics and photography, one summer field work in recreation.

Health Education Majors should take: Bact. 70, Public Health 15, 50, 141, 142, 143, 152, 153, 155, 156; Physical Education 55, 84, 106, 191; Psychology 33, 53, 105, 143; Foods and Nutrition 5; Sociology 60; Social Work 165; Zoology 3, 4, 111, 116; Speech 5, 67, and additional courses to meet secondary education certificate requirements.

Composite Teaching Majors in Health and Physical Education should take: P. E. 75, 83, 85, 106, 120-1-2, 130-1-2, 181, 183 184, 188, 189, 190, 191, 192; Public Health 50, 141, 142, 156; Sociology 60, 70; Psychology 33, 53; Foods and Nutrition 5; Social Work 162; Zoology 2, 111; Speech 5, 67; Physical Science 31, 32.

Minors in Health Education should take P.H. 15, 50, 143, 156. P.E. 84, Soc. 165. And add one class from the following: P.E. 55, P.H. 141, and 142, Foods 5, Soc. 162, Psy. 145. To meet the needs of the secondary schools, a composite major of health and some other closely allied subject is highly desirable.

### Master of Science Degree in Physical Education

The Department of Physical Education and Recreation offers 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, 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 4,500 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 clearly the fundamental laws of good health.

## SERVICE COURSES FOR MEN

2. Football. (1F)	Staff
4. Boxing. (1F, 1W, 1S)	Staff and G. Nelson
5. Boxing. (Advanced) (1F, 1W, 1S)	Staff and G. Nelson
7. Wrestling. (1F, 1W, 1S)	G. Nelson
8. Wrestling. (Advanced) (1F, 1W, 1S)	G. Nelson
12. Track. (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. Tumbling. (1F, 1W, 1S)	Heaton
38. Gymnastics. (1F, 1W, 1S)	Staff

**SERVICE COURSES FOR WOMEN**

39. Soccer-Speed Ball. (1F) Clark
40. Volleyball. (1F, 1W) Clark
41. Basketball. (1W) Clark
42. Softball. (1S) Clark
43. Field Hockey. (1S) Clark
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) Staff
48. **Modern Dance.** (Elementary). Fundamental movement techniques, elements of rhythmic and musical patterns. Relation of dance to other arts. Directed composition. (1S) Fuller
49. **Modern Dance.** (Intermediate). Further practice in technique involving greater control and experimentation in the possibilities of movement. Student directed studies in elementary composition. (1W, 1S) Fuller
52. **Swimming.** (Elementary). (1F, 1W, 1S) Staff
56. **Swimming.** (Intermediate). Prerequisites: P.E. 52 or satisfactory completion of elementary minimum service course requirements. (1F, W or S) Staff
60. **Body Conditioning and Physical Fitness.** Theory and practice of body conditioning. (1F, 1W, 1S) Clark
141. **Modern Dance.** (Advanced) Prerequisites: P. E. 48, 49 and consent of instructor. Further practice and development in techniques and composition of modern dance. (1W, 1S) Fuller

**SERVICE COURSES FOR MEN AND WOMEN**

1. Hiking. (1F, 1S) Waiters
3. Skiing (elem) (1W) Waiters
9. Fencing. (Elementary). (1F, 1W, 1S) Downs
18. Swimmers. (1F, 1W, 1S) Nelson
19. Skiing (Interm.) Staff
53. **Recreational Crafts.** (1W, 1S) Waiters
54. Casting. (1W, 1S) Staff
61. Archery. (1F, 1W, 1S) Gordon
66. Badminton. (1F, 1W, 1S) Downs
67. Tennis. (Elementary) (1F, 1S) Staff
68. Folk Dance. (1F, 1W) Staff
70. Tap Dancing. (1F, 1W, 1S) Staff
71. Tap Dance. (Interm.) Staff
72. Social Dancing. (1F, 1W) Heaton
73. Golf. (1S) Staff
74. **Life Saving.** Prerequisites: Ability to swim and permission of instructor. American Red Cross Certification is given to students who pass the examination. (2W, 1F) Staff
76. Social Dance. (Advanced) (1F, 1S) Heaton
90. Tennis. (Intermediate) (1S) Staff

136. Golf. (Advanced) (1S)	Staff
155. Diving. Prerequisite: Swimming. (1S)	Staff
161. Archery. (Advanced) Prerequisite: 61. (1W, 1S)	Gordon
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)

**Sp. 20. Playground Dramatics and Pageantry.** See Speech 20.

**20, 21, 22. Fundamentals of Sports.** A freshman laboratory course for men Physical education majors. These courses are prerequisites for P.E. 120, 121, 122. (1F, 1W, 1S) **Staff**

**24, 25, 26. Dance Laboratory.** For teaching folk, square and tap to freshman and sophomore women majoring or minorinf in physical education or dance. Material presented as a survey. (1F, 1W, 1S) **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. (Not offered 1952-53) **Heaton**

**53. Recreational Crafts.** Instruction in the art of building and wrapping of bait and fly casting poles, and in constructing various types of flies and lures. (1W) **Watters**

**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**

**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. (3F) (3W) **Hunsaker**

**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. (Not offered in 1952-53) **Staff**

**81. Rhythms and Dramatic Games.** Music for young children; its use in creative movement. Methods of presenting and developing rhythms are studied. (3F) **Staff**

**83. Playground and Community Recreation Leadership.** Lecturers and practical work. Lectures consider selection of suitable material and methods of handling various groups. (4S) **Heaton**

**84. Normal Growth and Development.** Traces the individual through the various stages of growth and development with special emphasis on principles and function of play. (3S) **Staff**

**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 administration. (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) **Downs**
- 94, 95, 96. Physical Education Laboratory.** For teaching team sports fundamentals to lower division women majoring or minoring in physical education. (Not offered 1952-53) **Downs**
- 97, 98, 99. Physical Education Laboratory.** For teaching fundamentals of individual sports to lower division women majoring or minoring in physical education. (1F, 1W, 1S) **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, Iondo, Theme and Variation, Canon and Round, Dance Suite. (2W) (Not offered 1952-53) **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) (Not taught 1952-53) **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**
- 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 men 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) **Staff**
- 130, 131, 132. Technique of Individual Sports.** For men students majoring in physical education. Prerequisites: P.E. 30, 31, 32. Students taught technique of individual gymnastics and aquatic sports. Each student expected to prepare a teaching syllabus for class work. Not offered 1952-53. **Staff**
- 135. Safety Education.** (a) The needs for safety education; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions, and readings, stressing various aspects of safety in many areas. (3W or S) **Gordon**
- 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) (Not offered 1952-53) **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**
- 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. (4S)
- 151. Techniques of Dance.** Techniques of a variety of dance types with emphasis on ballet and modern. (2S) **P. 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. (Not offered 1952-53.) **Downs**

**163, 164, 165. Techniques of Individual Sports for Women.** Upper division students majoring or minoring in physical education are taught techniques of teaching and officiating the following individual sports: Fall: tennis, badminton, and archery; Winter: tumbling and swimming, Spring: golf and fencing. (2F, 2W, 2S) **Downs**

**174. 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) **Gordon; Watters**

**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) **Fuller**

**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**

**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) **Staff**

**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.** Administrative procedures in the conduct of physical education in the high school; curriculum construction and program planning. (3S) **Hunsaker**

**188. Methods in Football.** Fundamentals of football, theory and practice, details of each position on the team, training, and managing, complete technique of developing offensive and defensive tactics. (2F) **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. (2W) **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 all 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 in Physical Education.** Practical studies of tests now used and technique of test construction. (3W) **Hunsaker**

**195, 295. Problems in Physical Education.** (F, W, S) Credits arranged. **Hunsaker**

**196, 296. Organization of Recreation.** Problems of organization and administration of community recreation departments, including staff, facilities, program of activities, and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school co-operation in a united recreation program. (3W) **Heaton**

**199, 299. Physical Education Seminar.** (3F, 2W, 3S) **Hunsaker**

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

**271. Research and Thesis Writing.** Credit arranged. **Hunsaker**

## Psychology

**Arden N. Frandsen**, Professor and Head of Department; **David R. Stone**, **Heber C. Sharp**, Associate Professors; Hospital Supervisors of Interns, **J. O. Cromwell, M.D.**, **E. A. Martin**.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Courses in the Department of 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, 181, 182, 183; and elective: from Psychology 80, 102, 105, 108, 114, 115, 121, 123, 140, 145, 155, 175, 191; Sociology 170; Education 110; Speech 167 or 173. As upper division electives, Zoology 111; Physiology 121, 122, 123; the Education courses for teacher certification; Sociology 130, 153; S. W. 165, 270; and 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 161, 181, and 183) is recommended for any high school teacher who expects to participate in the school guidance program, for social workers, for students majoring in speech correction, for students whose major is business administration, and for 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 191, 202, 212, 214, 215, 216, 217, 223, 231, 284, 285, 286, 287 or 187, and 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.

**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. Psychology of Personal and Social Adjustment.** Mental hygiene for lower division students from every school in the College. Principles of mental hygiene are developed and applied to personal and social behavior in educational, vocational, family, recreational, and religious activities. (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. 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)

**Staff**

**102. Educational Psychology.** A professional course for prospective high school teachers intended to increase understanding of adolescents and to develop greater 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.** 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. Applications 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**

**114-214. 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**

**115-215. Seminar. Readings and Discussions on Current and Special Topics in Psychology.** Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or periodical literature on some specialized topic, selected according to each student's interest. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2F, 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**

**123-223. 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 Psychology. (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 Psychology. (3S) **Sharp**

**145. Mental Hygiene.** Common personal and social adjustment problems of normal persons. The course should aid in cultivating personal efficiency and mental health, and increase understanding of the human problems dealt with by parents, teachers, social workers, and personnel workers. Prerequisite: General Psychology. (3W) **Sharp**

**155. Psychology of Business and Industry.** Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice; 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 Psychology. (3W) **Stone**

**175, 275. Physiological Psychology.** Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisite: General Psychology. (3S) **Sharp**

**181, 281. Clinical Psychology: Psychometrics Applied to Guidance, Adjustment Problems, and Remedial Teaching.** For school counselors, personnel workers, social workers, and clinical psychologists. Consideration is given selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisites: General Psychology and Elementary Statistics. For seniors or graduate students. (5F) **Frandsen**

**182, 282. Clinical Psychology: Individual Diagnostic Intelligence Testing.** Theory and techniques of individual diagnostic intelligence 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**

**183, 283. Clinical Psychology: Theory and Practice of Counseling and Psychotherapy.** In educational and vocational guidance, in improving school achievement and worker efficiency, and in treating problems of personal and social maladjustments, the uses of the following procedures are studied: Non-directive counseling; directed problem-solving interviewing; giving advice, assurance, persuasion, and information; play therapy; and use of controlled family, school, club or camp, community, and institutional environments. Prerequisite: General Psychology. (3S) **Staff**

**188, 288. Practicum in Clinical Psychology.** Arrangements are made for obtaining experience under staff supervision in vocational guidance; diagnostic testing and writing of interpretive 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. The psychological procedures

and the institution are selected according to qualifications and interests of each student. Time and credit arranged. (F, W or S) **Staff**

**191. History and Systems of Psychology.** A survey of the history of psychology and a critical comparison of the several systematic points of view on major problems in psychology. Alternates with 231. **Stone**

**202. Advanced Educational Psychology.** The contributions of modern theory and recent research to: motivation; learning; improvement of study habits; uses of tests in guidance and in measurement of achievement; social psychology of childhood and adolescence; personality and conduct problems; and mental health. Problems for master's degree thesis are indicated. Prerequisite: Ed. Psych. (3Su.) **Stone**

**212. Treatment of Psychometric Results.** Statistical methods of representation, and analysis of interrelationships of psychological test scores. (2W) **Frandsen**

**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, Egbert**

**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**

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

# 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, of which the following are represented, either by faculty membership or student chapters, 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 is required of all engineering students. Students taking this course must be immunized against Rocky Mountain Spotted Fever.

**Engineering Seminars.** Engineering seminars are a feature of the advanced engineering work. Courses 198 and 199 are required of all 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 take a supervised field trip covering the major engineering works in the Western United States. This trip is usually scheduled in the Spring Quarter.

## COMMON FRESHMAN CURRICULUM IN ENGINEERING

Dept. No.	Course Title	F	W	S
C.E. 1, 2, Elective <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. 1, 2, 3	Basic Military .....	1	1	1
		<hr/> 16	<hr/> 18	<hr/> 17

<sup>1</sup>Orientation taken in spring Quarter is under direction of the major department.

<sup>2</sup>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.

<sup>3</sup>See departmental curriculum for recommendation.

## ENGINEERING DRAWING

**G. Merrill Shaw**, Associate Professor and Head of Department; **Frederick Preator**, Professor; **Spencer H. Daines**, **Bertis L. Embry**, Associate Professors; **Willis A. Tingey**, Assistant Professor; **Edward A. Dionne**, 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 throughout the College.

Students may qualify for a minor in Engineering or Mechanical Drawing on completion of 18 credits, including Descriptive Geometry.

### Courses

**59. Blueprint Reading and Industrial Drawing.** A course of broad coverage for those desiring only one quarters work in drafting. Reading and interpretation of blueprints, lettering, use of instruments, and basic drafting practices. Two lectures, two labs. (3F, S) **Shaw; Dionne**

**60. Elementary Drafting.** A short course for Forestry students. Use of instruments, simple lettering, and drafting fundamentals. One lab. (W) **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.** An advanced course 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) **Preator; Shaw**

**94. Working Drawings and Specifications.** An introduction to architectural drawings 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. 93. (3W) **Shaw**

**95. Machine Design.** Mechanisms of power and motion and the design of machine parts incorporating standard methods consistent with industry. Prerequisite: E.D. 93. (3W) **Preator**

**194. Mechanical Perspective.** Practical problems in angular, parallel, and oblique perspective. Techniques in rendering finished drawings. Prerequisites: E.D. 94 or 95. (Taught alternate years with E.D. 195) (3S) **Preator; Shaw**

**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. (3S) **Preator**

**196. Aircraft Drawing.** Aircraft techniques, numbering systems, change methods, and technical specifications are stressed. Prerequisite: E.D. 95 (3S) **Preator; Shaw**

## AGRICULTURAL ENGINEERING

Spencer H. Daines, Associate Professor and Head of Department; J. E. Christiansen, O. W. Israelsen, C. H. Milligan, Joseph Coulam, Professors; A. Alvin

Bishop, Melvin J. Greaves, Bertis L. Embry, Associate Professors;

J. Donald Wadsworth, Assistant Professor.

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

Course	F	W	S
C.E. 1, 2; A.E. 3 .....	1	1	1
C.E. 65 .....	—	—	1
Math. 34 <sup>1</sup> , 35, 46 .....	3	5	5
English 17, 18, 19 .....	3	3	3
E.D. 61, 62, 63 .....	3	3	3
Chem. 10, 11 .....	5	5	—
A.E. 21 .....	—	—	3
M.S. 1, 2, 3 .....	1	1	1
	16	18	17

#### Sophomore

Course	F	W	S	Su
C.E. 84, 82, 85, 87 .....	4	3	4	4
Math. 97, 98, 99 .....	5	5	5	—
Phys. 20, 21, 22 .....	5	5	5	—
Agron. 56 .....	—	4	—	—
Ag. Econ. 53 .....	3	—	—	—
Speech 5 .....	—	—	3	—
M. S. or A.S. ....	1	1	1	—
	18	18	18	4

#### Junior

Course	F	W	S
C.E. 101, 102, 103 .....	4	4	4
C.E. 141, 142 .....	—	4	4
E.E. 107 .....	4	—	—
I.D. 112 .....	—	—	3
Agron. 107 .....	—	5	—
C.E. 196, 192, 173 .....	4	3	4
Approved Electives .....	5	3	3
	17	19	18

#### Senior

Course	F	W	S
C.E. 109, 110 .....	—	1	1
C.E. 105, 106 .....	6	6	—
A.E. 116, 106 .....	—	3	4
A.E. 115, 108 .....	3	—	4
I.D. 146, 148 .....	—	3	3
English III .....	4	—	—
C.E. 198, 199 .....	—	2	2
Approved electives <sup>2</sup> .....	3	3	3
A.E. 110 .....	3	—	—
	19	18	17

<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 Fall Quarter

<sup>2</sup>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. 150, 190. or other courses approved by the major professor.

### Courses

**3. Orientation.** A survey course for freshman Agricultural Engineering majors to familiarize them with the 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. (2W, W, or S) **Wadsworth**

**14. Farm Power for Agricultural Students.** Principles, operation, care and maintenance of internal combustion engines and electric motors. Prerequisite: Math. 34 or equivalent. 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. Prerequisite: Math. 34 or equivalent. 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) **Wadsworth**

**82. Forge Practice.** Fundamental operations. Recommended for Industrial Arts, Woodworking, and Building Construction students. Two labs. (2F, W, or S) **Wadsworth**

**83. Forge Practice.** A beginning course in forge practice, more extensive than 82. Three labs. (3F, W, or S) **Wadsworth**

**85. Forge Practice.** Advanced forging with emphasis placed on farm tools and implements. Prerequisites: A.E. 82 or 83. Three labs. (3W) **Wadsworth**

**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) **Coulam**

**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. Prerequisite: C.E. 101 (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) **Wadsworth**

**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) **Wadsworth**

**184. Ornamental Iron Work.** Designing and making of iron furnishings, interior and exterior railings, wrought iron furniture, frills, jardiniers, sign brackets, etc. Prerequisite: A.E. 82, 83, or 85. Two labs. (2S) **Wadsworth**

**198, 199. Engineering Seminar and Conferences.** Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Seniors. Two lectures. (2W, 2S) **Christiansen**

**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**, **H. R. Kepner**, \***C. H. Milligan**, **E. M. Stock**, Professors; **A. Alvin Bishop**, **Melvin J. Greaves**, **Spencer H. Daines**, **Bertis L. Embry**, Associate Professors; **Willis A. Tingey**, **Reynold K. Watkins**, Assistant Professors; **Edward A. Dionne**, Instructor.

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.

Analysis of the status of USAC Civil Engineering graduates shows that approximately 80 percent are in federal, state, city, or county positions, and about 20 percent in private practice or working for private corporations. Finding employment for graduates has not been a problem at this institution.

The 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 me-

\*On leave.

chanics 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. 82, 84, 85, 87 ..	4	3	4	4
C.E. 65 .....	—	—	1	Math. 97, 98, 99 .....	5	5	5	—
E.D. 61, 62, 63 .....	3	3	3	Physics, 20, 21, 22 5	5	5	5	—
Chem. 10, 11, (12) <sup>1</sup> .....	5	5	(5)	Speech 5 .....	3	—	—	—
English 17, 18, 19 .....	3	3	3	Economics 51 .....	—	5	—	—
Math. 34 <sup>2</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. 1, 2, 3, .....	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. 141, 142 .....	—	4	4	C.E. 108, 109, 110 ....	1	1	1
C.E. 196, 192, 173 .....	4	3	4	C.E. 150, 190, 182 <sup>4</sup> ..	4	3	2
C.E. 120 .....	3	—	—	C. E. 198, 199 .....	—	2	2
E.E. 107 .....	—	4	—	C.E. 193 <sup>5</sup> or I.D. 146 <sup>6</sup> ..	—	3	—
I.D. 112 .....	—	—	3	C.E. 194 <sup>5</sup> or I.D. 145 <sup>6</sup> ..	—	—	4 (3)
English III .....	4	—	—	C. E. 130 or A.E. 110 3	—	—	—
Approved electives <sup>8</sup> .....	3	3	3	Options <sup>7</sup> .....	3	3	4
	18	18	18		17	18	18

#### Senior Options

Highways				Irrigation and Drainage			
Course	F	W	S	Course	F	W	S
C.E. 124, 125, 127 .....	3	3	3	I.D. 149, 160, 147 .....	3	3	3
Structural				Sanitary			
C.E. 130 or Elective .....	3	—	—	Bact. 70, C.E. 195 .....	4	—	3
C.E. 131, 132 .....	—	3	3	P.H. 152, 153 .....	—	2	2

#### Courses

**1, 2, 3. Engineering Orientation.** A preview of engineering; including what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. (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**

<sup>1</sup>Required of students taking Sanitary Engineering option in lieu of T.E. 56 or Weld. 96.

<sup>2</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.

<sup>3</sup>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.

<sup>4</sup>Not required in Sanitary option.

<sup>5</sup>Required for Sanitary option.

<sup>6</sup>Required for Irrigation and Drainage option.

<sup>7</sup>Not required of students taking advanced Military or Air Science.

**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**

**82. Mapping and Office Practice.** Practice in mapping various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. 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 required for the course. Prerequisite: C.E. 85 or equivalent. Daily, eight hours a day for three weeks preceding Fall Quarter. (4 Su.) **Staff**

**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 laboratory. Spring Quarter, four recitations, one laboratory. (6F, 6W, 5S) **Kepner**

**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. Three lectures, one lab. Prerequisite: C.E. 103 (4F) **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. Two lectures, one lab. Prerequisite: C.E. 111 (3W) **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. Three lectures. (3F, 3S) **Kepner**

**131, 132. Structural Design Problems.** Advanced analysis and design of statically determinate and indeterminate structures. For students desiring to specialize in structural engineering. Prerequisite: C.E. 105. Three lectures. (3W, 3S) **Kepner**

**141, 142. Fluid Mechanics and Hydraulics.** Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, the flow of fluids in pipes and open channels, measurement of fluid flow and hydraulic principles underlying the design and selection of tangential and reaction turbines and pumps. Prerequisites: Physics 20, Math. 99. Two lectures, two labs. (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) **Staff**

**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) **Bishop; Watkins**

**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. (3S) **Dionne**

**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**

**192. Engineering Economy.** Financial and cost problems associated with engineering design, operation and construction. Determination of the economic alternative in engineering. Prerequisites: 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. Two lectures, 1 lab. (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**

**195. Sanitary Design.** Principles of design, construction and maintenance of water purification plants and sewage treatment plants. Problems involving both functional and structural design features are included. Prerequisites: C.E. 193, 194. Three lectures, one lab. (4S) **Kepner**

**196. Elementary Engineering Thermodynamics.** The general energy equations, principles of the thermodynamic cycles for internal combustion engines, processes of vapors, air compression, refrigeration, and flow of fluids. Prerequisites: Physics 22 and Math 99. Three lectures, one lab. (4W or S) **Dionne**

**198, 199. Engineering Seminar and Conferences.** Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Seniors. Two lectures. (2W, 2S) **Christiansen**

**201, 202. Advanced Structural Theory.** Advanced mechanics of materials, including photo-elastic analysis. Classical and modern theories of indeterminate structural analysis, including model analysis. Theory of limit design. Prerequisite: C.E. 132. Three lectures. (3F or 3W) **Kepner**

**203. Advanced Structural Design.** Design of modern indeterminate structures. Student selects suitable structure for design and proceeds from preliminary planning stage to complete detailing. Prerequisite: C.E. 132. (3S) **Kepner**

**210. Earth and Rock-Fill Dams.** Design of flexible type (earth or rock-fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. (3W) **Greaves**

**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. (3F) **Greaves**

**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. (3S) **Greaves**

**215. Hydro-Electric Design.** Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. For graduate students and specially prepared seniors. Prerequisite: C.E. 143. Time arranged. (3S) **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 life 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**

**208. Graduate Thesis.** Time and credit arranged. Each quarter. **Staff**

**299. Graduate Seminar.** Time arranged. (1S) **Staff**

## Irrigation and Drainage Engineering

**O. W. Israelsen**, Professor and Head of Department; **J. E. Christiansen**, **C. H. Milligan**,\* Professors; **A. Alvin Bishop**, Associate Professor; **Vaughan E. Hansen**, Assistant Research Professor; **George D. Clyde**, **Wayne D. Criddle**, **C. W. Lauritzen**, **Willis Barrett**, **Gregory L. Pearson**, **Warren Rasmussen**, Collaborators, U. S. Department of Agriculture.

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 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

\*On leave

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 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.				Those with B.S. degree in C.E.			
Course	Quarter			Course	Quarter		
	F	W	S		F	W	S
C.E. 105, 106 .....	6	6		C.E. 210, 211, 212 .....	3	3	3
C.E. 150, I.D. 112, 245 .....	4	3	3	C.E. 241, 242, 243 .....	3	3	3
I.D. 146, 147 .....		3	3	I.D. 146, 147 .....		3	3
C.E. 241, 242 .....	3	3		I.D. 149, 112, 245 .....	3	3	3
Agron. 218 .....			3	Agron. 218 .....	3		
I.D. 298 .....	3	1	6	C.E. 298 .....	4	4	4
	<u>16</u>	<u>16</u>	<u>15</u>		<u>16</u>	<u>16</u>	<u>16</u>

### TYPICAL PROGRAMS OF STUDY FOR DEGREE OF IRRIGATION ENGINEER

First Year							
Those with B.S. degree in A.E.				Those with B.S. degree in C.E.			
Course	Quarter			Course	Quarter		
	F	W	S		F	W	S
C.E. 105, 106 .....	6	6		Math. 130, 131, 132 .....	3	3	3
C.E. 150 .....	4			Agron. 130, 131, 132 .....	3	3	3
Agron. 130, 131, 132 .....	3	3	3	Agron. 218, I.D. 146, 147 .....	3	3	3
I.D. 146, 147 .....		3	3	C.E. 201, 202 .....	3	3	
Agron. 218 .....			3	I.D. 149, 160, 245 .....	3	3	3
I.D. 149, 160, 245 .....	3	3	3	Thesis .....			4
Thesis .....			4		<u>15</u>	<u>15</u>	<u>16</u>
	<u>16</u>	<u>15</u>	<u>16</u>				

Second Year							
Those with B.S. degree in A.E.				Those with B.S. degree in C.E.			
Course	Quarter			Course	Quarter		
	F	W	S		F	W	S
C.E. 210, 211, 212 .....	3	3	3	C.E. 210, 211, 212 .....	3	3	3
C.E. 241, 242, 243 .....	3	3	3	C.E. 241, 242, 243 .....	3	3	3
C.E. 201, I.D. 112, 212 .....	3	3	3	I.D. 112, 212 .....	3		3
Thesis .....	6	6	6	C.E. 250 .....		3	
	<u>15</u>	<u>15</u>	<u>15</u>	Thesis .....	6	6	6
					<u>15</u>	<u>15</u>	<u>15</u>

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

**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 efficiencies, salinity, etc. (3W) **Israelson; Bishop**

**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. Two lectures, one lab. (3S) **Israelson**

**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. Two lectures, one lab. (3W) **Bishop**

**147. Design of Water Control Irrigation Structures.** Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: I.D. 146. Two lectures, one lab. (3S) **Milligan; Bishop**

**148. Design of Farm Irrigation Systems.** Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems, for application of water by both surface and sprinkling methods, Prerequisite: I.D. 146. (3S) **Staff**

**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) **Bishop**

**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. Prerequisite: I.D. 149. (3W) **Bishop**

**212, 213. Problems in Irrigation Agriculture.** Advanced study of major problems in agriculture under irrigation, including management of irrigation projects, consolidation of irrigation companies, formation of soil conservation districts, irrigation efficiencies, erosion control, irrigation and the alkali problem. Instruction in residence or in absentia. Time arranged. Credit according to work done. Each quarter. **Staff**

**241. Research in Irrigation and Drainage.** Regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student research projects. A qualified student may elect a problem in any phase of irrigation or drainage in civil engineering for study at the College or elsewhere. Results in research may be used in part to meet the requirements for an advanced degree. This course is for research other than that for thesis. Research for graduate thesis is covered by I.D. 298 or C.E. 298. Credit according to work done. Each quarter. Time arranged. **Staff**

**245. Advanced Design of Drainage Systems.** Modern drainage systems with special reference to depths and spacing of gravity drains in relation to soil permeabilities, sources and qualities of excess water; also gravity drains and pumping ground water for drainage, leaching and reclamation of saline and alkali soils. (3S) **Israelson**

**249. Advanced Irrigation Institutions and Management.** Problems in laws governing the acquirement and adjudication of water rights, and in the distribution of water, according to established rights; the improvement of irrigation and drainage enterprises; and operation problems. Instruction in residence or in absentia. Each quarter Time arranged. Credit according to work done. **Milligan**

**298. Graduate Thesis.** Time and credit arranged. Each quarter. **Staff**

## Electrical Engineering

(Electronic and Communications Option)

**Larry S. Cole**, Professor and Head of Department; **Clayton Clark, Bertis L. Embry**, 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 10 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.

### ELECTRICAL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Electrical Engineering

(Electronic 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 <sup>1</sup>	5	5	C.E. 84 .....	4	—	—
E.D. 61, 62, 63 .....	3	3	3	Speech 5 .....	—	—	3
English 17, 18, 19 .....	3	3	3	M.S. or A.S. ....	1	1	1
Chem. 10, 11 .....	5	5	—		19	16	19
T.E. 56 .....	—	—	3				
M.S. 1, 2, 3 .....	1	1	1				
	16	18	17				
Junior				Senior			
Course	F	W	S	Course	F	W	S
E.E. 124, 125, 126 .....	5	5	5	E.E. 120, 160, 129 .....	5	3	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. 131, 142 .....	3	—	3
Math. 122 .....	3	—	—	E.E. 151, 152, 153 .....	2	2	2
E.E. 150 .....	2	—	—	E.E. 175, 176, 177 .....	1	1	1
Econ 51 .....	—	5	—	C.E. 192, 196 .....	—	3	4
Geology 3 .....	—	—	5	English 111 .....	4	—	—
	18	18	18	Elective .....	—	3	—
					18	17	20

<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.

### 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. Prerequisite: 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, Kirchhoff's laws, and network theorems to the solution of simple and complex resistive circuits L-R and C-R circuit analysis; introduction to magnetic and electric fields and circuits. Prerequisite: (or concurrent registration in) Math. 98. (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. (5S)

**Jones**

**107. Electrical Machinery.** 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.** 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. Communication Circuits.** Principles and characteristics of transmission lines, networks, matching sections and filters. Prerequisite: E.E. 81. Four lectures, one lab. (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. (5F)

**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. Audio Frequency Amplification.** Principles and design of R-C and transformer coupled audio amplifiers; class A, AB, and B power amplifiers; principles of inverse feedback applied to AF amplifiers; distortion and gain measurement techniques. Prerequisite: E.E. 124. Three lectures, two labs. (5W)

**Cole**

**126. Radio Frequency Amplification.** Principles and design of RF voltage and power amplifiers; neutralization methods; modulation; RF oscillators; detectors; complete radio transmitters and receivers. 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; record-

ing equipment and methods; audio system planning and design; acoustic and special audio measurement problems. Prerequisite: E.E. 125. Three lectures, two labs. (5S) **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. Prerequisite: 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. (3S) **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 electronic methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms, R.F. heating. Prerequisite: E.E. 126. Two lectures, one lab. (3W) **Clark**

**175, 176, 177.** 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**

## Tool Engineering

**Frederick Preator**, Professor and Head of Department; **G. Merrill Shaw**, Associate Professor; **W. Karl Somers**, 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 twenty-five engine lathes, three universal and one vertical milling machine, one planer, three shapers, four precision tool grinders, five 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 .....	1	1	—	Math. 97, 98, 99 .....	5	5	5
T.E. 50 .....	—	—	1	Phys. 20, 21, 22 .....	5	5	5
Math. 34 <sup>1</sup> , 35, 46 .....	3	5	5	T.E. 52, 53, 54 .....	3	3	3
Eng. 17, 18, 19 .....	3	3	3	E.D. 93 .....	3	—	—
E.D. 61, 62, 63 .....	3	3	3	T.E. 57, 58 .....	—	2	2
Chem. 10, 11 .....	5	5	—	M.S. or A.S. ....	1	1	1
T.E. 56 .....	—	—	3				
M.S. 1, 2, 3 .....	1	1	1				
	16	18	17		17	16	16

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	Aero. 131, T.E. 158 .....	—	2	3
E.E. 107, 108 .....	—	4	4	B.A. 155 .....	3	—	—
Welding 91, 94 .....	3	—	3	English 112 .....	—	4	—
Econ. 53 .....	3	—	—	Approved electives .....	3	—	3
	17	16	18		18	17	17

### 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.

<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.

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 .....	2	2	2	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
	17	16	17		17	16	16

### Courses

**50. Orientation.** Lectures, films, and field trips to acquaint the student with diverse opportunities for the tool engineer in industry. (IS) **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) **Somers**

**53, 54. Machining Processes.** (Shaper and Milling Machines) Introduction to work on the shaper, planer, and milling machines prepares the student for advanced work. (5F, S) **Preator**

**56. Machine Practice for Engineers.** Acquaints engineering students with basic machine shop operations. (3S) **Somers**

**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) **Somers**

**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 turret, milling machines, and precision grinding equipment. Prerequisites: T.E. 51, 52, 53. Two lectures, three labs. (5F, W) **Somers; Preator**

**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) **Somers**

**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) **Somers**

**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. (3F) **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, tolerances, springs, details of jigs, cam layouts, and techniques

of preparing tool drawings. Each student designs and constructs a set of tools for production of a specific workpiece. Emphasis on development of creative ability and originality. Prerequisite: C.E. 103. Two lectures, three labs. (5F, 5W, 5S) **Preator; Somers**

**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**

## 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 opportunities for further progress and advancement in industry, as has been demonstrated by many industrial leaders. By returning to this institution for further training, qualified students may apply most of the credit earned under this program toward a degree, and thus better prepare themselves for supervisory and managerial positions.

The Division of Technology, as an integral part of a Land-Grant College of Agriculture and Mechanic Arts, is providing the types of training specified in the Morrill Act of 1862, establishing the Land-Grant Colleges.

## 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 aircraft and aircraft engine mechanics. The curricula, equipment, and instructors have been properly certificated in compliance with regulations for the training of aircraft and aircraft engine mechanics. The department also is certificated as repair station No. 4066.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Aircraft and Aircraft

**Engine Mechanic Ratings.** This training prepares graduates for both aircraft and aircraft engine maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in aeronautics with a general college education. Training is based upon the objective of scientifically and systematically developing students to a point where they can assume responsible positions in the industry. Students graduating in the four-year curriculum are required to have successfully accomplished the written and practical C.A.A. examinations for Aircraft 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, sand-blast, 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, 93 .....	—	3	3	E.D. 61, 62 .....	3	—	3
T.E. 51 .....	3	—	—	C.E. 65, E.E. 21 .....	1	4	—
M.S. 1, 2, 3 .....	1	1	1	M.S. or A.S. ....	1	1	1
	17	19	18		18	18	18
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
Aero. 134 .....	—	—	4	English 111 or 112 .....	—	4	—
	16	16	15	E.D. 196 .....	—	—	3
				T.E. 150 .....	3	—	—
				C.E. 176 .....	—	—	3
				Approved Electives ....	—	5	3
					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				

\*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.

### 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. The adaptation of stressed skin aircraft construction; a study of strength, weight and use of aluminum alloys, design factors; methods of fabrication; fittings, forgings, and extrusions; monocoque, and semi-monocoque structures; stress analysis; materials and processes. (Tech. 5; Shop 5; W) **Klein**

**7. 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 5; 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 specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, inspection methods, materials and processes, volumetric efficiency, and compression ratios. (Tech. 5; Shop 5; F) **Summers**

**9. 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 the 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; major and minor 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. (IS) **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**

\*First number is for Technical or lecture course, second number for Shop or laboratory course.

**101. Advanced Engine Operation and Performance.** Principles underlying relationships between altitude, power output, and fuel consumption of aircraft engines. Torque stand testing, fuel and octane rating studies. Analysis and summarizing of test data. (F) **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 stop-watch 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**

**134. Aircraft Electrical Systems and Equipment.** The more complex electrical 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**

## Air Conditioning and Refrigeration

**A. Q. Woodruff**, Instructor and Head of Department

This department prepares skilled technicians in air conditioning and refrigeration and allied fields, including: (1) winter heating of small commercial buildings and homes; (2) sheetmetal work; and (3) domestic appliances.

Courses are arranged to meet needs of the industry and requirements of the various national societies interested in air conditioning and refrigeration. A chapter of the Refrigeration Service Engineers Society, an international organization, is established on the campus; majors in this department have opportunity to join this society.

New, large air conditioning and refrigeration laboratories contain excellent equipment for thorough study of domestic and commercial refrigeration, air conditioning, sheet metal work, and electric motors. They are equipped with new type test instruments and tools for practical and complete testing of all standard equipment.

With exception of AC & R 1, which is taught each Fall quarter, all AC & R courses are taught alternate years only. Beginning winter quarter, all Freshmen and Sophomores will take the same AC & R courses. All Junior and Senior students will take the same AC & R courses.

## CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Air Conditioning and Refrigeration

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
AC & R 1, 2, 11 .....	6	6	6	AC & R 61, 21, 22 .....	3	6	6
English 17, 18, 19 .....	3	3	3	Chem. 10, 11; Econ. 51 .....	5	5	5
E.D. 61, 62 .....	3	3		Bact. 1, 2 .....	5		
Math. 34 <sup>1</sup> , 35, 44 .....	3	5	3	Welding 91, 94 .....		3	3
T.E. 51 .....			3	B.A. 109 .....			3
M.S. 1, 2, 3 .....	1	1	1	E.D. 63 .....	3		
				Electives .....		2	
Total .....	16	18	16	M.S. or A.S. ....	1	1	1
				Total .....	17	17	18
Junior				Senior			
Course	F	W	S	Course	F	W	S
AC & R 151, 152, 162 .....	4	4	4	AC & R 111, 141, 135 .....	4	4	4
AC & R 161 .....		3		AC & R 112, 194 .....		3	2
Physics 17, 18, 19 .....	5	5	5	B.A. 147, 148 .....		3	3
A.E. 4 .....	4			English 111 or 112 .....	4		
C.E. 176 .....		3		C.E. 130, 190 .....	3	3	
Electives .....	3	2	8	Electives .....	3	3	7
Total .....	16	17	17	Total .....	17	16	16

<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.

**Note:** For those desiring a minor in Industrial Education or who desire to meet the course requirements for a State Teacher's Certificate, the necessary Industrial Education courses may be substituted for certain related courses in the above curriculum, provided the proposed courses are approved by the department of Industrial Education and Air Conditioning and Refrigeration.

**Two-Year Vocational Technical Program.** Certificate of Completion in Air Conditioning and Refrigeration will be granted upon application and payment of diploma fee to students completing the Freshman and Sophomore curriculum.

### Courses

**1. Basic Refrigeration.** Study and practice of basic refrigeration fundamentals, including the refrigeration cycle, refrigerant properties, refrigeration equipment, tools, tubing and controls. 3 lectures, 3 labs. (6F)

**Woodruff**

**2. Domestic Refrigeration.** Continuation of AC & R 1. Heat transfer and heat loads are introduced. Component parts are assembled and operated in various domestic boxes. Maintenance and repair of hermetic units, small open-type units, carbonators, absorption systems and electric motors are included. 3 lectures, 3 labs. (6W)

**Woodruff**

**7. Principles of Refrigeration.** Same as AC & R 1 except without lab. (Taught with AC & R 1.) 3 lectures. (3F)

**Woodruff**

**11. Commercial Refrigeration.** Construction, operation, servicing and repair of commercial refrigeration systems. Includes commercial boxes, compressors, condensers, evaporators, and controls. Emphasizes calculation, selection, and balance of components for efficient operation. 3 lectures, 3 labs. (6S)

**Woodruff**

**21. Air Conditioning, Basic.** Fundamental properties of air and vapor mixtures; instruments and equipment used in modern air conditioning. Includes use of sling psychrometers, thermostats, humidistats, gauges, hygrometers, anemometers, psychrometric charts, and effective temperature charts. Numerous practical problems are solved. 3 lectures, 3 labs. (6W)

**Woodruff**

**22. Air Conditioning Application.** Design, construction, operation, servicing, and repair of commercial and domestic air conditioning equipment. Calculation and assembly of air ducts, heating coils, cooling coils, air cleaners, fans and blowers, and temperature and humidity controllers. 3 lectures, 3 labs. (6S)

**Woodruff**

**61. Sheet Metal Work.** Principles and practices in use of the sheet metal tools, equipment, and materials; forming fabrication, and layout techniques related to the air conditioning industry and the building trades. Prerequisite: E.D. 62. 2 lectures, 1 lab. (3F)

**Woodruff**

**111. Low Temperature Refrigeration.** Advanced training in the principles, construction, operation and repair of low temperature refrigeration equipment, including current developments in the field of low temperature application. Prerequisite: AC & R 11. 2 lectures, 2 labs. (4F)

**Woodruff**

**112. Advanced Commercial Refrigeration.** Advanced technical training in design and testing of commercial and industrial refrigerating units with concentration on refrigeration cycles, refrigerant selection, heat loads and transfer problems, food cooling, freezing, and storage. Prerequisite: AC & R 11. 3 lectures. (3W)

**Woodruff**

**135. Electrical Appliance Servicing.** A study of technical fundamentals of electrical appliances; their construction, operation, and servicing. 2 lectures, 2 labs. (4S)

**Woodruff**

**141. Advanced Air Conditioning.** Advanced technical training in the principles of design, construction, operation, maintenance and economy of

air conditioning systems for all seasons. 2 lectures, 2 labs. (4W)  
**Woodruff**

**151. Electric Motors.** Advanced technical training in the principles, construction, operation and repair of motors used in air conditioning and refrigeration equipment. Prerequisite: E.E. 21. 2 lectures, 2 labs. (4F)  
**Woodruff**

**152. Air Conditioning Electric Circuits.** Advanced technical training in the principles, construction, operation and repair of electric circuits used in air conditioning and refrigeration. Prerequisite: E.E. 21. 2 lectures 2 labs. (4W)  
**Woodruff**

**161. Stokers and Oil Burners.** Technical training in the principles, operation, construction and repair of the modern coal stokers and oil burners. Prerequisite: AC & R 22. 3 lectures. (3W)  
**Woodruff**

**162. Instrument Technology.** Technical training in the principles, operation and repair of pressure and temperature instruments. 2 lectures, 2 labs. (4S)  
**Woodruff**

**191, 192, 193. Advanced Laboratory Work.** Advanced work in construction, testing, repair of specialized air conditioning and refrigeration equipment. For senior students majoring in Air Conditioning and Refrigeration. Prerequisite: English 111 or 112. 2 labs. (2F, W or S)  
**Woodruff**

**194. Seminar.** Current topics in production methods, cost design, supply and organization of interest to Air Conditioning and Refrigeration majors. (2S)  
**Woodruff**

## Automotive Technology

**Owen Slaugh**, Instructor and Acting Head of Department; **Clyde Hurst**, **Lynn Willey**, **Vern R. Beecher**, Instructors.

This department offers instruction in Automotive and Diesel Technology, Automotive and Diesel Mechanics, Auto Body Reconditioning, and general service courses for students in other departments who desire to become familiar with various phases of the automotive industry.

Training facilities include a new building designed specifically for automotive and aircraft instruction. Laboratories contain the most modern servicing equipment and provide ideal conditions for study in automotive technology.

A Bachelor of Science degree in Industrial Technology is offered with majors in Automotive or Diesel. A major in either Automotive or Diesel mechanics prepares a student to be a technician who can better interpret the designs of the engineer and direct the work of repairmen. This major also prepares students to become shop foremen, shop superintendents, and with special preparation, school instructors. These curricula provide excellent foundations for entrance into civil service, private business, and managerial positions with large companies.

A certificate of completion is offered in Automotive or Diesel Mechanics and Auto Body Reconditioning for students who desire intensive short term training to prepare them as skilled mechanics. Students wishing to prepare themselves better for advanced or graduate study at other institutions in Automotive, Diesel or closely allied branches of engineering may do so by substituting mathematics and engineering courses during their junior and senior years.

## CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Automotive Technology

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
Auto 1, 2, 3 .....	6	6	6	Auto 4, 5, 6 .....	6	6	6
Math. 34 <sup>1</sup> , 35, 44 .....	3	5	3	Physics 17, 18, 19 .....	5	5	5
English 17, 18, 19 .....	3	3	3	Weld. 91, 94 .....		3	3
E.D. 61, 62, 93 .....	3	3	3	T.E. 51 .....		3	
C.E. 65 .....			1	E.E. 21 .....	4		
M.S. 1, 2, 3 .....	1	1	1	Auto 54 .....			3
	16	18	17	M.S. or A. S. ....	1	1	1
					16	18	18

Junior				Senior			
Course	F	W	S	Course	F	W	S
Auto 101, 102, 103 .....	3	3	3	Auto 151, 152, 154 .....	3	3	3
Auto 61, 162 .....	3	3		P.H. 155 or Zool. 111 .....		3	(4)
Econ. 51 .....	5			Econ. 125 .....	3		
Chem. 10, 11 .....	5	5		Aero. 131 .....		3	
Weld. 190 .....		3		I.E. 113 .....			3
C.E. 176 .....			4	B.A. 109, 147, 148 .....	3	3	3
English 112 .....			4	T.E. 150 .....			3
I.E. 120 or Psy. 155 .....			3	A.E. 82 .....	2		
Electives .....	2	3	3	Chem. 125 .....	5		
	18	17	17	Electives .....		5	5
					16	17	17

## Diesel Technology Major

Substitute Auto 21, 22, 23, 121, 122, and 123 for Auto 1, 2, 3, 101, 102, and 103.

## Auto Body Reconditioning Major

Substitute Auto 52 and 53 for Auto 2; Auto 12, 13, and 16 for Auto 4, 5, and 6; and Auto 113 for Auto 102. Interchange E.D. 62 and 93 with Weld. 91 and 94.

## Two-Year Vocational Technical Program

Certificates of completion in Automotive Repair, Diesel and Heavy Duty 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.

## Courses\*

**1. Steering Correction.** (Technical and Shop.) Construction, operation, and repair of all parts of the automobile chassis, including axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, and hydraulic brakes. Modern methods of repair. (6F) **Beecher**

**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) **Staff**

**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**

<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.

\*First number is for Technical or lecture course, second number for Shop or laboratory

**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) **Slough**

**5. Auto Electrics.** (Technical and Shop.) Construction, operation, and repair of the electric systems used on modern automotive equipment, including the battery, lighting systems, ignition systems, starting and generating systems. Modern methods of repair. (6W) **Slough**

**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. Prerequisite: Auto. 2, 4, 5 (6S) **Slough**

**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) **Willey**

**13. Body Reconditioning.** (Technical and Shop.) Construction and repair of automobile bodies. Units include checking and alignment of automobile bodies, repair and replacement of damaged body panels such as the dash, cowl, trunk, rocker, floor, side, top and door panels. (6W) **Willey**

**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) **Willey**

**21. Heavy-Duty Chassis.** (Technical and Shop.) Construction, operation, and repair of automotive diesel and heavy-duty chassis. Units covered are heavy-duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (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 students. Two lectures, two 2-hr. labs. (3F) **Hurst**

**52. Automobile Power Plants.** Principles and practice in construction, operation, and servicing of the modern automobile power plant. Units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmission, overdrive, fuel, cooling and lubrication systems. Open to any college student. Two lectures, 2-hr. labs. (3W) **Hurst**

**53. Automobile Electricity.** Principles and practice in the construction, operation, and servicing of electrical systems used in modern automobiles. Units studied include starting, generating, lighting, ignition, and special accessory systems. Open to any college student. Two lectures, two 2-hr. labs. (3S) **Hurst**

**54. Service Techniques.** Theory and practice in service station and shop management records. Professional ethics. Selling and installing automobile accessories. Minor repairs and lubrication. (3S) **Staff**

**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) **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 students. Two lectures, two 2-hr labs. (3S) **Willey**

**101. Frame Suspension and Steering Systems.** (Technical and Shop.) Geometry and design factors of various types of steering units including power steering. Wheel balancing, frame alignment, and power brakes are studied in relation to steering facility. Prerequisites: Auto 1, Math. 34, 44. (3F) **Beecher**

**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) **Staff**

**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. (3S) **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. (3F) **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 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) **Slaugh**

**154. Seminar and Special Problems.** A systematic review of the automotive field with discussions and reports on recent developments. Laboratory analysis of special problems encountered in automotive work. 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**, Assistant Professor; **Bert V. Allen**, **Vern R. Beecher**, **Chas. W. Hailes**, **Fred R. Pryor**, Instructors.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. Students who complete their undergraduate courses receive a Bachelor of Science degree in Industrial Education, with a major in Industrial Arts Education or Trade and Industrial Education.

The Master of Science degree in Industrial Education is offered to majors in Industrial Arts Education or Trade and Industrial Education. The following courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments: I.E. 102, 104, 107, 109, 110, 111, 120, 121, 123, 124, 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 Sciences, 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	*Chem. 10, 11, Econ. 51 .....	5	5	5
Math. 34 <sup>1</sup> , 35, 44 .....	3	5	3	Botany 1 .....	5	—	—
E.D. 61, 62, 93 .....	3	3	3	Physiology 4 .....	—	5	—
W.W. 61, 62 .....	5	5	—	Psychology 53 .....	—	—	5
Art 1 .....	—	—	3	E.E. 21 .....	—	—	4
T.E. 51 .....	—	—	5	Ind. Ed. 40 .....	2	—	—
M.S. 1, 2, 3 .....	1	1	1	A.E. 82, 184 .....	—	2	2
	16	17	18	Speech 5, Art 2 .....	3	3	—
				M.S. or A.S. ....	1	1	1
					16	16	17
Junior				Senior			
Course	F	W	S	Course	F	W	S
*Physics 17, 18, 19 .....	5	5	5	Ind. Ed. 107, 112 .....	3	8	—
Psychology 102 .....	5	—	—	Ind. Ed. 109, 121, 123 .....	5	3	6
Sociology 70 .....	—	5	—	Ind. Ed. 145, 102 .....	3	3	—
Pub. Health 155 .....	—	—	3	Educ. 114 .....	3	—	—
Ind. Ed. 142, 141 .....	3	—	2	Ind. Ed. 110 .....	—	3	—
Auto 162, Art 113, 114 .....	3	2	2	Electives .....	3	—	10
Educ. 113 .....	—	3	—		—	—	—
W.W. 170 .....	—	—	2		17	17	16
Electives .....	—	—	3				
	16	15	17				

<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 Fall Quarter.

\*Students who cannot fit these courses into their program may, upon special approval of the Department Head, substitute other exact science courses.

### Courses

**13. Driver Training.** For persons who desire to learn to drive an automobile correctly and safely. Includes study of traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; general mechanics, operation, and servicing of the 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.** Labor and management relations in present-day industry, with attention to the human element in industrial relations. An orientation course for students preparing to enter industry with a certificate of completion in a two-year vocational technical program. Three lectures. (3S) **McBride**

**40. Sheet Metal.** Fundamental operations and tool processes of sheet metalwork. 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. (2S) **Hailes**

**43. Recreational Crafts.** Especially for students majoring in recreational leadership. Consists of: (1) planning and organizing craft work as part of community recreational programs, and (2) laboratory work in crafts, such as wood, leather, plastics, metals, and others. One lecture, one 3-hour lab. (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 109. Three lectures. (3W)

**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**

**109. 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 sheet, reference, tests, and instructional schedule. Each student completes this work for one unit of instruction. Prerequisite: I.E. 107. Five lectures. (5F) **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, 109, 121. Three lectures. (3W) **Mortimer**

**111. The General Shop.** Consists of a comprehensive study of the "General Shop" type of organization; its advantages and limitations; the content and organization of subject matter applicable to this type of organization, together with suitable methods for presenting subject matter. Class control and trends of the program are considered. Prerequisite: I.E. 107. Three lectures. (3 Arr.) **Staff**

**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 school. (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) **France**

**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. (3F, W or S) **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 W) **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, 109. 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. 109 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.) **Staff**

**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. Two 3-hour labs. (2F) **Hailes**

**142. Plastic.** Acquaints students with the new and important group of plastics 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 program. Three 3-hour labs. (3F) **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 art program of secondary schools. Prerequisite: E.E. 21. One lecture, two 3-hour labs. (3F) **Mortimer**

**154, 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: Psych. 102. Three lectures. (3 Arr.) **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. Advanced 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**

**251. Administration of Industrial Education.** The laws, regulations and policies affecting Industrial Education programs; organization and management necessary for successful operation of these programs; pertinent problems and their solutions. Students prepare a plan of administration suitable for their school or district. Three lectures. (3 Arr.) **Staff**

**252. Supervision of Industrial Education.** Latest methods in supervision of Industrial Arts Education and Trade and Industrial Education. For administrators, supervisors, and teachers in service who are responsible for improvement of industrial arts and vocational education through supervision, or for students who wish to prepare for supervisory work. Students prepare a plan of supervision suitable for their situation. Three lectures. (3 Arr.) **Staff**

**253. Co-ordination in Industrial Education.** Functions of co-ordinators in their relationship to the administration and supervision of industrial education programs; responsibilities and duties of co-ordinators; emphasis on procedures most successful in performance of these duties. Three lectures. (3 Arr.) **Staff**

**255. Techniques in Writing Instruction Sheets.** Principles underlying development of instruction sheets for use in industrial arts and trade and industrial education programs. Prerequisite: I.E. 109. 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. Prerequisites: I.E. 110. Two lectures. (3 Arr.) **Staff**

**260. Diversified Occupations.** Content, methods, and special devices to be used in the teaching of Diversified Occupations. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of instruction in Diversified Occupations. Three lectures. (3 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. Students prepare a syllabus covering essential materials for a course in part-time education. Three lectures. (3 Arr.) **Staff**

**263. Evening School Programs.** Development, organization and improvement of evening school programs in Industrial Education. Students prepare a syllabus covering essential materials needed for such a program. Three lectures. (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. Three lectures. (3 Arr.) **Staff**

**265. Apprenticeship.** Development, organization, and improvement of apprentice training programs for industry. Students prepare a syllabus covering essential materials needed for such a program. Three lectures. (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. Students prepare a syllabus covering essential materials for one unit of Related Instruction. Three lectures. (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.) **Staff**

**270. Seminar in Industrial Education.** Gives opportunity for investigation and reporting of individual problems. (1-2 Arr.) **Staff**

**271. Research and Thesis Writing.** Provides for individual work in thesis writing in industrial education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arr.) **Staff**

**290, 291, 292. Advanced Studies under Plan "B."** Special library and seminar problems or studies designed to meet requirements for reports under plan "B." (2-3 Arr.) **Staff**

**NOTE:** To be of maximum service to Industrial Education teachers and supervisors in this Intermountain Region in keeping them current with the national picture in Industrial Education, the Industrial Education Department has organized special courses primarily for these teachers in service as they attend Summer Session to do graduate work. The notation "Arranged—Staff" is made for the specific purpose of bringing in, as visiting staff, noted leaders for these courses as the situation demands.

## TRADE AND INDUSTRIAL EDUCATION

Designed primarily for instructors and supervisors in Vocational Technical Education and/or in Vocational Industrial Education 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 Chairman of the Division of Technology and the department heads concerned.

## CURRICULUM

Degree: Bachelor of Science in Industrial Education

Major: Trade and Industrial Education

A. Trade Training .....			Credits
Individuals who have trade experience or other qualifying training may secure a maximum of 18 credits by special examination.			30-60
B. English Composition .....			
English 17, 18, 19, or English 10 & 110 .....	9		
		Total	
C. General Group Requirements .....		40	
<b>Biological Science</b>			
Botany 1 or Zoology 1 .....	5		
Physiology 4 .....	5	10	
<b>Exact Science</b>			
Math 34 .....	3		
Physics 3 & Chemistry 1, or Physics 31 & 32 .....	10	13	
<b>Language and Arts</b>			
Speech 1 .....	5		
Choice of Art 1, Art 3, Music 1, L.A. 3, or any lower division literature course .....	3	8	
<b>Social Science</b>			
Economics 51 .....	5		
Psychology 53 .....	5	10	

D. Industrial Education and Psychology		
Industrial Education 102, 107, 109, 110, 118, 120, 121, 154, 167 .....	27	
Education 113 .....	3	
Psychology 102 .....	5	
English 111 .....	4	
Economics 125 .....	3	
Woodwork 6 .....	3	45
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 .....	192	

## PHOTOGRAPHY

Bert V. Allen, Fred R. Pryor, Instructors

General service courses are available for college students desiring instruction in fundamentals of photography and in advanced work. A special two-year curriculum is available for students wishing to prepare themselves as commercial photographers. Sufficient courses are available for a major in photography for students desiring a Bachelor of Science Degree. The student may choose either of two programs, namely: (1) the Industrial Education program leading to a Unit Shop certificate, or (2) the Industrial Technology program. The student should plan his entire program and have it approved by the department head not later than the first quarter of his junior year.

Some courses offered are designed especially as service courses for students registered in Agriculture, Journalism, Engineering and Technology, Forestry, and other specialized subjects where photography supplements their major.

### Two-Year Curriculum in Photography leading to a Certificate of Completion in Commercial Photography

Freshman				Sophomore			
Courses	F	W	S	Courses	F	W	S
Photo. 51, 62, 63, .....	3	5	5	Photo. 64, 65, 66 .....	5	5	5
Photo. 61 .....	2	—	—	B.A. 64, 65, 66 .....	3	3	3
Art 1 (3, 26, 33, 32) .....	3	3	3	Ag. Econ. 53 .....	3	—	—
English 17, 18, 19 .....	3	3	3	Psych. 53 .....	—	5	—
Math. 34 .....	3	—	—	Zool. 1 or Bot. 1 .....	5	—	—
Phys. 31, 32 .....	—	5	5	Physiol. 4 .....	—	—	5
Landscape 20 .....	3	—	—	Journ. 112 .....	—	—	3
M.S. 1, 2, 3 .....	1	1	1	M.S. or A.S. .....	1	1	1
	—	—	—	Elective .....	—	3	—
	18	17	17		17	17	17

### 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) **Pryor**

**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; Pryor**

**62, 162. Industrial Photography.** Training in news, architectural, and machine photography. The units include photoflash, interior lighting, action and news, still life, table-top, fashion, building, machine and aerial photography. Blocking, photomontage, and air-brush work are included. Prerequisite: Photo 51. Two lectures, three labs. (5F) **Allen**

**63, 163. Outdoor Photography.** Training in all types of outdoor photography including scenic, agricultural, livestock, wild life, and plant life. Especially suited to students in Forest, Range and Wildlife Management and in all phases of agriculture. Aerial photography is also included as it applies. Prerequisite: Photography 51. Two lectures, three 3-hour labs. (5S) **Allen**

**64, 164. Motion Picture Photography.** Necessary technique for various types of work with 8 mm. and 16 mm. cameras and projectors. Planning the production, camera technique, lighting, filters, close-up photography, titles, editing and projection. Prerequisite: Photo. 51. 2 lectures, three 3-hr. las. (5S) **Allen**

**65, 165. Portrait Photography.** Training in portrait and group photography. Units include model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Considerable emphasis is placed upon child and home portraiture. Prerequisite: Photo 51. Two lectures, three 3-hr. labs. (5W) **Allen**

**66, 166. Color Photography.** Problems in color, Ektachrome and Kodachrome, use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32, Photo 51. Three lectures, two labs. (5F) **Allen**

**151. Photographic Problems.** Designed to meet needs of individual students in solving advanced photographic problems. May be repeated when desirable but not to exceed three times total registration. Repeating students must have the approval of the major professor and the department head. Prerequisite: Photo. 51. Two lectures, two 2-hr. labs. (3F, W or S) **Allen**

## Welding

**A. R. Kemp,** Instructor and Head of Department; **Rawson Child,** Instructor.

The Welding Department offers progressive instruction in Oxy-Acetylene and Electric-Arc Welding. General service courses are provided for students wishing a fundamental knowledge of this modern field of industry. Completion of the four-year curriculum leads to the degree of Bachelor of Science in Industrial Technology. This curriculum combines a technical program with a broad general education and prepares students to enter industry as skilled technicians, sales engineers, or to enter the welding business for themselves. A two-year Vocational Technical program is available for students preparing to enter the industry as skilled workers.

## CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Welding Technology

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
Welding 41, 42, 43 .....	5	5	5	Welding 44, 45, 46 .....	5	5	5
English 17, 18, 19 .....	3	3	3	Math. 97, 98, 99 .....	5	5	5
E.D. 61, 62, 63 .....	3	3	3	Physics 17, 18, 19 .....	5	5	5
Math. 34 <sup>1</sup> , 35, 44 .....	3	5	3	M.S. or A.S. ....	1	1	1
A.E. 82 .....	2	—	—				
T.E. 56 .....	—	—	3				
M.S. 1, 2, 3 .....	1	1	1				
	17	17	18		16	16	16

<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 Fall Quarter.

Junior				Senior			
Course	F	W	S	Course	F	W	S
C.E. 101, 102, 103 .....	4	4	4	Welding 161, 162, 193 .....	3	3	3
Welding 153, 154, 155 .....	3	3	3	C.E. 105, 106, 107 .....	6	6	5
Econ. 125 .....	3	—	—	C.E. 109, 110 .....	—	1	1
Chem. 10, 11 .....	5	5	—	English 111 .....	4	—	—
Geology 3 .....	—	—	5	C.E. 198, 199 .....	—	2	2
C.E. 196 .....	—	4	—	T.E. 150 .....	3	—	—
E.E. 107 .....	—	—	4	Electives <sup>2</sup> .....	—	5	5
	15	16	16		16	17	16

### Two-Year Vocational Technical Program

#### Certificate of Completion in Welding

First Year:				Second Year:			
	F	W	S		F	W	S
Welding 41, 42, 43 .....	5	5	5	Welding 44, 45, 46 .....	5	5	5
English 17, 18, 19 .....	3	3	3	Chem. 1 .....	5	—	—
W.W. 6 or Math. 34 .....	3	—	—	Ind. Ed. 21 .....	—	—	3
E.D. 61, 62 .....	3	3	—	T.E. 51 .....	—	5	—
A.E. 83 .....	—	—	3	Ind. Ed. 40 .....	—	—	2
M.S. 1, 2, 3 .....	1	1	1	Auto. 52 .....	3	—	—
Electives <sup>2</sup> .....	2	5	5	M.S. or A.S. .....	1	1	1
	17	17	17	Electives <sup>2</sup> .....	3	5	5
					17	16	16

### 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.** A comprehensive study of acetylene welding of ferrous and non-ferrous metals as used by industry. (5F, 5W, 5S) **Child**

**44, 45, 46. Electric Welding.** A comprehensive study of 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, W or S) **Child**

**92, 93. Aero Welding.** Principles and practices in fundamentals of aircraft welding. Prepares for C.A.A. tests. (3W, 3S) **Child; Kemp**

**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, W or S) **Child**

**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) **Child**

**153, 154, 155. Advanced Acetylene Welding.** Covers hard surfacing, special bronzing problems, pipe welding, and other problems. Qualifies for code, tests. Prerequisite: 43. (3F, 3W, 3S) **Child; Kemp**

**161, 162. Advanced Electric Welding.** Covers special problems in arc-welding and qualifies students for code test. Prerequisite: 46. (3F, 3W) **Kemp**

**190. Advanced Acetylene Welding.** Vertical and overhead steel welding. Special problems. Prerequisite: 90. (3F, 3W, 3S) **Child**

<sup>2</sup>Must be approved by adviser.

**191. Advanced Electric Welding.** Vertical and overhead arc-welding. Special problems. Prerequisite: 94. (3F, 3W, 3S) **Kemp**

**193. Welding Seminar.** Current topics in production methods, cost, design, and manufacture of welded products used in modern industry. (2S) **Kemp**

## Woodwork and Building Construction

**Joseph Coulam**, Professor and Head of Department; **William E. Mortimer**, Professor; **Charles N. Merkley**, Associate Professor; **Ross A. Nyman**, **Dan H. Swenson**, **Charles W. Hailes**, **Lynn A. Thomson**, Instructors.

**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. 1, 2, 3 .....	1	1	1	E.E. 21 .....	4	—	—
Elective .....	3	—	—	M.S. or A.S. ....	1	1	1
	18	17	17		17	17	17
Junior				Senior			
Course	F	W	S	Course	F	W	S
B.A. 109, 147, 148 .....	3	3	3	W.W. 171, 172, 173 .....	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	History 135 C.E. 190 .....	—	3	5
Electives .....	—	2	5	English 111 or 112 .....	4	—	—
	17	18	18	Zoology 111 .....	—	4	—
				Art 126 .....	3	—	—
				Electives .....	—	5	3
					15	17	17

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	—
A.E. 82 .....	—	—	2	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
	17	18	16		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. (3S)

**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)

**Hailes**

**160. Pattern Making.** Simple patterns illustrating construction and choice of materials and principles of shrinkage. Prerequisite: W.W. 61. Five labs. (5F, W or S)

**Swenson**

**161, 162, 163. Building Construction.** Estimating and contracting. Construction and design of homes, farm buildings and apartments. Covers porch work, stairways, dormers, special roofs, insulation and other special construction, 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)\*

\*Where requirements for the lab. are met under another course, 3 credits for lecture only.

**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, 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) **Mortimer**

## **SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT**

**LEWIS M. TURNER, Dean**

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## General Information<sup>1</sup>

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. Naturally-vegetated lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range, soil conservation, and wildlife problems; all offer study projects and opportunities for demonstration. Herds of elk and deer come close to the campus during the winter.

The Wildlife Management department is greatly enhanced through the establishment of a research agency of the U. S. Fish and Wildlife Service on the campus. This Federal Wildlife Research Unit is a cooperative project with the college, the Utah Fish and Game Department, and the American Wildlife Institute. Representatives of this agency assist in class and laboratory instruction, and aid in directing research of graduate students. Graduate fellowships in Wildlife Management are available through this Unit.

The comparative newness of the fields of forestry, range, wildlife, soil conservation, watershed management, and forest recreation, and the unquestioned need for their correlation in permanent wild land management, present excellent opportunities for men who wish to enter these fields of public service. The purpose stressed is the handling of wild lands so that they may be of continuing benefit for present and future generations of citizens.

## RECOMMENDED ENTRANCE QUALIFICATIONS

Students entering the School of Forestry, Range, and Wildlife Management will make satisfactory progress if they have had high school algebra, chemistry, physics, typing, botany, zoology, and geometry. Any student who has not had high school algebra or geometry will be required to make up these deficiencies. These basic mathematics and science courses should be taken in high school.

## COURSES OF STUDY

The Curricula of this school are designed to train men primarily for private, federal government or state work in (1) forest management, (2) range management, and (3) wildlife management. Forest management majors may choose between two options: one designed to train for general forestry work in the West, and one strictly for timber management. The range majors may choose, in the junior year, to specialize in soil conservation and watershed management. Wildlife management majors may select a curriculum to train for general administrative work, with big game and related problems, or a curriculum in general wildlife management with considerable emphasis on small game, or a curriculum in fishery management.

## FIVE-YEAR CURRICULA RECOMMENDED

Efficient management of wild land resources requires a broad fundamental knowledge of many sciences and arts. For this reason, many forest schools have recognized that the usual four-year program of study is inadequate to give the student sufficient training in both the basic sciences and in the technical subjects of his chosen field. Therefore, a five-year curriculum of study is recommended. The first two years of the regular four-year course of study are practically the same in all depart-

<sup>1</sup>For more detailed information, request a copy of the School of Forest, Range, and Wildlife Management bulletin from the Dean of that School.

ments. Specialization in a major field begins in the third or junior year. This program gives the student a minimum of basic training and cultural foundation. The five-year program provides for an additional year devoted principally to general training in supporting arts and sciences. This furnishes a better foundation for the technical studies of the last two years and a superior cultural background that is desirable for advancement in public service.

### SUMMER CAMP

The School has purchased and leased 3,000 acres of forest and range land approximately 22 miles from the campus within the Cache National Forest, where summer camp facilities have been established. Field instruction is required for graduation in addition to the regular 12 quarters of classroom work. Also, at least one summer season of field experience with a recognized conservation agency is expected of all students.

Attendance at the camp is required between the sophomore and junior years. The summer camp opens soon after the close of the spring quarter and continues for 7 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, and board is provided on a cost basis. 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 generally will 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 two years of 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, covering all branches of the major field. This trip is required of all seniors prior to graduation. The trip for wildlife majors usually is scheduled over the first week of May, and range majors over the second or third week. The trip for forestry majors is more extensive and includes a period of ten days or two weeks just prior to the end of the spring quarter. Each student pays his share of the cost of the trip. A fee of about \$35.00 is charged each student to defray the general expenses of the trip.

### SCHOLARSHIP

A high standard of scholarship must be maintained by the student enrolled in forestry or the associated fields because of the technical nature of the work, the high professional standards, and the character of the Civil Service examinations that are required for federal service. A student is required to maintain an average grade of C or better to remain in the school.

### GENERAL REQUIREMENTS

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management:

- A. At least 201 credits (quarter hours) exclusive of basic Military Science and/or Physical Education.

- B. Nine of the 20 credits must be earned at Summer Camp.  
 C. All courses prescribed under the study program of the chosen major.  
 D. All of the following general requirements:  
 1. English and Speech, 16 credits, of which at least 3 must be Speech.  
 2. Social Science, 8 credits, of which 5 are General Economics.  
 3. Military Science or Physical Education—6 quarters.

All students must demonstrate proficiency in written and spoken English; any student showing marked deficiency is required to pass successfully certain supplementary or corrective courses in addition to the requirement stated above.

## BASIC COURSES

Required of all students majoring in the School of Forest, Range, and Wildlife Management.

Freshman				Sophomore			
Course	F	W	S	Course	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	2	—
<sup>2</sup> Mathematics 34, 35, 44 ....	3	5	3	Physics 6 .....	5	—	—
Speech 5 .....	—	3	—	Agronomy 58 .....	—	—	5
Forestry 1 .....	—	—	—	Economics 51 .....	—	5	—
<sup>3</sup> Animal Husbandry 1 .....	—	—	3	<sup>4</sup> Geology 3 .....	5	—	—
<sup>4</sup> Animal Husbandry 2 .....	—	—	2	<sup>5</sup> Botany 120 .....	—	—	5
Civil Engineering 60 .....	—	1	—	<sup>7</sup> Zoology 3, 4, 13 .....	5	5	5
				<sup>6</sup> Animal Husbandry 10 .....	—	—	5

## SUMMER CAMP

Required courses at summer camp:

	Credits
Forestry 96, Forest Surveying .....	3
Forestry 97, Forest Practice .....	2
Range Management 98, Range Practice .....	2
Wildlife Management 99, Wildlife Practice .....	2

Senior College standing is prerequisite to junior and senior college courses.

All students should note 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 and Forestry 10.

## Forest Management

J. W. Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; C. M. Bowen, R. R. Moore, Associate Professors; 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

<sup>1</sup>—Not required of ex-military personnel.

<sup>2</sup>—Students presenting 1½ units of high school algebra or otherwise qualified to take Math. 35 are not required to take Math. 34.

<sup>3</sup>—Required only of students taking the general forestry option.

<sup>4</sup>—Required of range majors and students taking the general forestry option.

<sup>5</sup>—Required of forest and range management majors only.

<sup>6</sup>—Required in the sophomore year of forestry majors only.

<sup>7</sup>—Required of wildlife majors only.

<sup>8</sup>—Required of wildlife management and range majors excepting soil conservation students.

branches of forestry, 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 adequate training in timber management, and in addition some training is provided in range management, wildlife management, recreation, and watershed management. This type of curriculum is better adapted to the needs of personnel of the public land managing agencies in the Intermountain region and throughout most of the western states. The second option, timber management, provides major emphasis on the growing, harvesting, and utilizing of timber crops.

It is highly desirable that every student engage in field work related to forestry in the summer following the freshman and junior years. Students are urged to obtain employment with such agencies as the U.S. Forest Service, Park Service, or comparable state agencies, or in private forest industries. The school maintains an employment service to aid students in obtaining such summer work.

**Electives:** Electives necessary to complete the program of the Junior College 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 major professor.

The degree of Master of Science in Forest Management is given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. Normally the student is required to take all of the forestry courses in the 200 series (See Description of Courses.) One to two years may be required, depending on the ability of the student, the adequacy of his background, and his thesis problem. 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

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Measurements I, II .....	Forestry		106	107		4	4
Dendrology I, II .....	Forestry	112	113		3	2	
Silviculture I, II .....	Forestry		114	115		3	3
Forest Protection I, II .....	Forestry	118	119		3	3	3
Public Land Administration .....	Forestry		132			3	
Plant Ecology .....	Range	126			5		
Range Management .....	Range	162			5		
General Wildlife Management .....	Wildlife			150			5

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Management .....	Forestry	121			4		
Forest Economics and Finance .....	Forestry		122			4	
Wood History and Technology .....	Forestry	126			3		
Forest Policy .....	Forestry		133			2	
Improvements and Recreation .....	Forestry			137			3
*Range Forage .....	Range		176			4	
*Watershed Management .....	Range	180			4		
*Junior English .....	English			112			4
Aerial Map Interpretation .....	Forestry		134			3	
Junior Field Problems .....	Forestry			146			3

English 111 may be substituted for English 112.

## B. Timber Management

Students who choose the timber management option will substitute the following courses for those marked (\*) above:

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Seeding and Planting .....	Forestry			116			2
Logging .....	Forestry	125			3		
Mechanical Properties .....	Forestry		129			2	
Milling and Products .....	Forestry			130			4
Forest Entomology .....	Zoology	105			3		
Forest Pathology .....	Botany		140			4	

Recommended electives for the general forestry option are Forestry 130, and for the timber management option, Forestry 117, Accounting 133, and Woodwork and Construction 67.

## Description of Courses

**1. General Forestry.** A general survey of the professions of forest management, range management, soil conservation, recreation and wildlife management; character of the work; and relation of multiple uses of wild land to the welfare of the state and the nation. Open to all students. (3F and S) **Turner**

**10. Forest and Range Conservation.** An introduction to conservation problems designed to acquaint students with the nature and extent of the organic resources of the United States and methods of conserving them. Open to all students except majors in the School of Forestry. (2W) **Turner**

**11. Winter Woodcraft.** Lectures and field trips are designed to train the student in the proper way of living in the wilderness. Prerequisite: ability to ski. The student must furnish ski boots and suitable outdoor clothing. Lecture, field trips. (3W) **Kelker**

**96. Forest Surveying.** Practical field problems in surveying methods commonly employed in forest, range and wildlife management and 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 uses. 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 in Forest Management. 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 students in Forest Management. Prerequisite: Summer camp. (3W) **Bowen**

**106. Forest Measurement I.** Measurements of timber in the log, the tree, and the stand. Log rules and volume tables. Timber cruising practices. Prerequisite, summer camp. (4W) **Bowen**

**107. Forest Measurement II.** Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all-aged, and residual cut over stands. Prerequisite: For 106. 3S) **Bowen**

**112. Dendrology I.** Hardwoods. Identification, distribution, and silvics of the more important forest trees in the U. S. Prerequisite: Summer camp. (3F) **Daniel**

**113. Dendrology II.** Conifers. Identification, distribution and silvics of the more important forest trees in the U. S. Prerequisite: Summer camp. (2W) **Daniel**

**114. Silviculture I.** Characteristics of the tree species which influence the silviculture practice in the United States. Prerequisites: Summer camp; Range 126 and Botany 120. (3W) **Daniel**

**115. Silviculture II.** Silviculture 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. Economic and physical effects. Prerequisite: Summer camp. (3F) **Floyd**

**119. Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. (3W) **Floyd**

**121. Forest Management.** Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. Prerequisites: Summer camp; For. 106, 107, 115. (4F) **Moore**

**122. Forest Economics Finance.** A study of economic aspects of the wood resource. Determination of monetary values in forest growing stock and land. Analysis of alternative management methods by use of standard valuation techniques. Forest Taxation and Insurance. Prerequisite: For. 121 (4W) **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 the United States. (3F)

**129. Mechanical Properties.** A study of factors affecting the strength of wood. (2W) **Bowen**

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

**132. Public Land Administration.** History, organization and functions of conservation agencies affecting range, forest and wildlife administration. (3W) **Floyd**

**133. Forest History and Policy.** Development of Federal, State, and private forest policy. (3W) **Turner**

**137. Improvements and Recreation.** Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and development of areas suitable for this purpose. 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. (1-3F, W or S) **Staff**

**146. Junior Field Problems.** Study of forest operations. (3) Senior year. Fee, \$35.00 **Staff**

**201, 202, 203. Advanced Forestry Seminar.** Review and discussion of more advanced current literature. For students in the graduate school. (1F, 1W, 1S) **Turner**

**204. Forest Ecology.** Study of historical and present distribution of forest species and forest types and the physical-biological basis of distribution. (3W) **Turner**

**205. Silviculture.** Advanced treatment of silvics and silviculture with emphasis on physiological aspects of both subjects. (3W) **Daniel**

**206. Forest Management.** Application of forest management principles; forest organization and development; forest regulation and sustained yield; management principles and control of operations. (2F) **Moore**

**207. Forest Finance.** Economic principles which control forestry enterprises; capital value of forest properties; cost of production in forest enterprises; determination of rate of profit; principles of appraising damages; stumpage valuation and forest taxation and insurance. (2W) **Moore**

**208. Forest Measurements.** Application of statistical measurements to forest problems. (3F) **Bowen**

**209. Forest Economics.** Study of economics of a private forest enterprise, including the economics of production, manufacture and marketing. (3F) **Floyd**

**210. Forest Problems.** Individual advanced study upon a selected forest-staff 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; **Max E. Robinson, Grant A. Harris**, Assistant Professors.

A full study program leading to the Bachelor of Science degree is available in range management. This curriculum acquaints the student with methods of maintaining production of native lands and methods of maintaining range livestock. Opportunity is given to take special instruction in soil conservation and watershed management.

Also, the degree of Master of Science in Range Management is granted upon completion of an arranged course of study. Students desiring this advanced work should obtain permission from the major professor at least twelve months before the degree is to be granted, at which time a program of research and study will be outlined. Adequate facilities are available to allow emphasis upon soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in range management or a related subject is prerequisite.

Several assistantships are available annually for graduate students in range management. For information concerning assistantships, prospective students should consult the department head.

## COURSE OF STUDY

### Freshman and Sophomore

Students majoring in range management take the freshman and sophomore study program outlined for the School of Forestry.

Junior				Senior			
	F	W	S		F	W	S
*Botany 108 .....	—	4	—	Range 164 .....	—	3	—
Range 126 .....	—	—	5	*Range 181 .....	—	3	—
Range 162 .....	5	—	—	Range 192, 193, 194 .....	1	1	1
Wildlife 150 .....	—	—	5	*English 112 .....	—	—	4
*Range 177 .....	3	—	—	*Forestry 101, 102 .....	3	3	—
*Range 179 .....	—	—	2	Range 180 .....	4	—	—
Forestry 132 .....	—	3	—	Range 196 .....	—	—	3
*A.H. 110, 125 .....	3	3	—	An. Hus. 150 .....	—	—	—
Botany 120 .....	—	5	—	Animal Nutrition .....	4	—	—

<sup>1</sup>English 111 may be substituted for English 112.

## Suggested Electives

		F	W	S
Agron. 131, 132	Applied Statistics	3	3	—
Agron. 114	Soil Survey and Land Classification	—	—	3
W. L. 155	Economic Wildlife	—	3	—
For. 118	Forest Protection I.	3	—	—
Agron. 103	Forage Crops	4	—	4
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. 115	Soil and Plant Relations	—	3	—
Agron. 160	Genesis and Morph. of Soils	—	3	—
Chem. 90	Biochemistry	5	—	—
Zool. 2	Zoology	5	—	5
Zool. 112	Genetics	5	5	5

MAJOR—SOIL CONSERVATION AND  
WATERSHED MANAGEMENT

A major in soil conservation and watershed management is allowed with substitution of the following courses for those marked (\*) above and for An. Hus. 10 in the sophomore year.

Agronomy 103	Forage Crops	—	—	4
Agronomy 114	Soil Survey and Land Classification	—	—	3
Agronomy 125	Soil Conservation	—	—	3
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 are suggested for students who wish to minor in Range Management. (requirements subject to change upon approval of the department head.): Range 126, Plant Ecology, 5 credits; Range 160, 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, 3 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) **Staff**

**126. Plant Ecology.** Analysis of habitat factors that influence plant growth and distribution. Attention is given to plant succession and competition and to detailed methods of studying and mapping vegetation. Prerequisites: Botany 30; Agronomy 56 or 58. (5F or S) **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: Botany 25. Four lectures, one lab. (5S) **Cook**

**162. Range Management.** A course dealing with problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisites: Botany 30 and Range 98. (5F) **Cook**

**164. Advanced Range.** Technical problems in range management. Prerequisites: Range 126 and 162. (3W) **Stoddart**

**176. Range Forage Plants.** Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Prerequisite: Botany 30. (4W) **Cook**

**177. Forbs and Browse.** A study of forbs and browse including identification, region of growth, habitat, and forage value. Prerequisite: Botany 30. (3F) **Cook**

**179. Poisonous Plants.** Important poisonous plants, including general methods of livestock handling and range management practices, identification, region of growth, habitat, poisoning symptoms, remedies and control measures. Prerequisite: Botany 30. One lecture, one lab. (2S) **Cook**

**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 162. (3W) **Smith**

**192, 193, 194. Range Seminar.** A systematic review of range management and related subjects. Prerequisite: Range 162. (1F. 1W. 1S) **Staff**

**195. Range Problems.** Individual study and research upon a selected range problem. (1-3F, W or S) **Staff**

**196. Junior Field Problems.** Field study of range management operations and research. (3S) Fee, \$30.00 **Smith**

**200. Thesis.** Original research and study on a problem in range management. Open only to graduate students. (1-15F, W or S) **Staff**

**204, 205. Graduate Seminar.** Current scientific papers in range management, and analysis of range problems in foreign countries. Not open to under-graduate students. (1F. 1W) **Smith**

**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; **J. B. Low**, Professor and Biologist, U. S. Fish and Wildlife Service; **O. B. Cope**, **H. L. Moore**, Fishery Biologists, 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. Those interested in a particular field may choose one of three options to be completed in the senior year. The option in management of big game stresses the economic and ecological relationships of large mammals to forest and range, with emphasis on western conditions. The second option, featuring small game and fur-

bearers, considers representative areas of the United States for illustrative purposes in the management of each game bird or mammal. Attention is given to game farm procedures. The fisheries option considers the production of both cold water and warm water fish in relation to local land uses. Land utilization often affects seriously the water habitat. Thus training is given in survey work of the water and the land from which it drains. In addition to this general training, the student participates in creel censuses, measuring the growth rate and productivity of fish in inland waters, and in various forms of habitat improvement.

Any one of these programs trains students for both general administrative and investigative work with state and federal agencies.

Graduate standing is required in order to take courses numbered over 200.

Upon completion of a prescribed course and fulfillment of the requirements 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 of the U. S. Department of the Interior, 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 four or more graduate research fellowships for students working toward a master's degree in Wildlife Management. Candidates for fellowships are chosen from applicants who have a bachelor's degree in Wildlife Management of 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.

## 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 145	Principles of Wildlife Mgt.	3	—	—
Wildlife 157, 158, 159	Seminars	1	1	1
Wildlife 160	Animal Ecology	3	—	—
Wildlife 171	Field Problems	—	—	2
Wildlife 172	Problem Orientation	—	2	—
Wildlife 175	Wildlife Law Enforcement	—	3	—
Range 126	Plant Ecology	—	—	5
Agronomy 131	Applied Statistics	3	—	—
English 112 <sup>1</sup>	Junior English	—	—	4

#### A. Big Game Management:

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.

Wildlife 153	Management of Big Game	—	5	—
Wildlife 146	Management of Upland Game	—	—	3
Forestry 101, 102	Forestry Survey	3	3	—
Range 162	Range Management	5	—	—

<sup>1</sup>English 111 may be substituted for English 112.

Range 176 .....	Range Forage Plants .....	—	4	—
Range 180 .....	Watershed Management .....	4	—	—
Zoology 122 .....	Mammalogy .....	—	4	—

### B. Small Game and Furbearer Management:

Wildlife 146 .....	Management of Upland Game .....	—	—	3
Wildlife 147 .....	Mgt. of Waterfowl and Furbearers .....	—	—	5
Wildlife 161 .....	Limnology .....	3	—	—
Bot. 112 .....	Aquatic and Marsh Plants .....	3	—	—
Range 162 .....	Range Management .....	5	—	—
Poultry Hus. 104 .....	Incubation and Brooding .....	—	—	2
Zoology 121 .....	Ornithology .....	—	—	4

### C. Fishery Management:

Wildlife 165 .....	Fishery Management .....	—	—	3
Wildlife 169 .....	Techniques in Fishery Mgt. ....	—	5	—
Wildlife 161 .....	Limnology .....	3	—	—
Wildlife 147 .....	Mgt. of Waterfowl and Furbearers .....	—	—	5
Bot. 112 .....	Aquatic and Marsh Plants .....	3	—	—
Range 180 .....	Watershed Management .....	4	—	—
Zoology 155 .....	Ichthyology .....	—	4	—

**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) **Kelker**

**146, 246. Management of Upland Game.** Taxonomy, life histories, distribution, environment needs, enemies, and plans for management of game birds and small mammals. Prerequisites: Wildlife 99 and 145. Additional work required of graduate students. (3S) **Sigler**

**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) **Kelker**

**150. General Wildlife Management.** Principles of animal ecology and wildlife management; life histories, ecology, economics and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife majors. Field trips arranged. (5S) **Kelker**

**153, 253. Management of Big Game.** Life histories, distribution, numerical variation, enemies, and plans for management of native big game animals. Prerequisites: for W. 153; Wildlife 145. 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 of skulls and skins; a brief evaluation of hawks and reptiles. Particularly adapted for students in forest, range, and agriculture. (3W) **Kelker**

**157, 159. Wildlife Seminar.** Discussion of current developments in Wildlife management. (1F, 1S) **Staff**

\*Or Hydrology Civil Engineering 171.

**160, 260. Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships 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. (3F) **Sigler**

**165, 265. Fishery Management.** Principles and techniques of lake, pond, and stream improvements; ecology of game fishes, propagation methods, and common fish diseases. Prerequisites: Zool. 155 and Wildlife 99. (3S) **Sigler**

**169, 269. Techniques in Fishery Management.** Mechanics of collecting and analyzing life history material of fishes. Prerequisites: Zool. 155, 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. (1-3 F, W or S) **Staff**

**171. Field Problems.** Study of wildlife management operations by various agencies in the Intermountain Region. 2S, fee \$30.00 **Kelker; Sigler**

**172. Problem Orientation.** A discussion of needs and approach to wildlife investigations: analyzing the problem, presenting data, and drawing conclusions relative to research in wildlife management. (3W) **Kelker**

**175. Wildlife Law Enforcement.** Review of state and federal regulations of fish and game; discussions of apprehension of violators; collection of evidence, and its use in the court. Offered in even-numbered years. (3W) **Sigler**

**257. Graduate Seminar.** Study of logic and the scientific method with special reference to wildlife investigations. (2F) **Kelker**

**258. Graduate Seminar.** Discussion of current investigations by class members and by representatives of state and federal agencies. (2W) **Low**

**259. Graduate Seminar.** Review of current literature pertaining to the completion and publication of technical papers. (2S) **Sigler**

**263. Marsh Management.** Marshland restoration and maintenance for waterfowl and aquatic furbearers; economic returns from marshlands; ecological plant succession and methods of restoration and maintenance of plant food and cover; management of public and private waterfowl shooting grounds; evaluation and control of predation and sickness; water level manipulation and controls for year-round operations of marshlands. (3S) **Low**

**270. Advanced Wildlife Problems.** Research problems chosen, the project outlined and planned, and data collected by the student qualified for investigation in Wildlife Management. (5-10 F, W or S) **Staff**

**272. Wildlife Thesis.** Analysis, presentation, and interpretation of field data for the graduate thesis. Prerequisite: Wildlife 270. (5-10 F, W or S) **Staff**

## **SCHOOL OF HOME ECONOMICS**

**ETHELYN O. GREAVES, Dean**

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## General Information

All Home Economics courses are intended primarily to prepare young women for homemaking. Admission to the School of Home Economics requires completion of 15 high school units including: English, three units; algebra, one unit; social science, one unit; and natural science (required laboratory work), one unit.

The function of homemaking includes all areas in Home Economics. Therefore, courses are planned to prepare young women to carry the knowledge and skills of expert homemaking into various institutions of complex modern society. Accordingly, students may elect majors leading to a Bachelor's Degree in the following divisions of Home Economics:

### **CHILD DEVELOPMENT AND PARENT EDUCATION, CLOTHING, TEXTILES AND RELATED ARTS, FOODS AND NUTRITION, HOUSEHOLD ADMINISTRATION, HOME ECONOMICS EDUCATION.**

The chief professional opportunities open to majors in Home Economics are: (1) Child Development and Parent Education: Elementary Education; Research; Institutional Management; Teaching. (2) Clothing Textiles and Related Arts: (4) Household Administration: Homemaking. (5) Home Economics Education: Teaching; Homemaking, Extension Service.

## **REQUIREMENTS COMMON TO ALL CURRICULA**

All Home Economics 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. These common requirements make up a large proportion of the work of the first and second years.

Courses comprising the core are: Personal Development; Clothing for the College Girl; Nutrition; Food Preparation; The Child in the Family; and Home Management.

## **LOWER DIVISION REQUIREMENTS**

See "Group Requirements" under "Academic Regulations."

**Core Requirements:** Additional courses that must be taken to meet core requirements of the School of Home Economics are: C. T. & R. A. 4 Personal Development, 2 credits; C. T. & R. A. 8 Clothing for the Col. Girl, 5 credits; F & N 5 Nutrition, 3 credits; F & N 24 Food Preparation, 5 credits; C. D. 67 The Child in the Family, 5 credits; and H. Ad. 49 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 field—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

**Helen L. Porter**, Associate Professor; **Marian C. Aikin**, **Bruce Gardner**, Assistant Professors

Students majoring in Child Development and Parent Education must complete the following courses: Child Development 80, 138, 174, 175; Speech 18 or English 24; Psychology 105; Zoology III; Sociology 60; and Household Administration 150. The remaining credits may be selected from the approved courses listed below, in conference with the major advisor: C. T. and R. A. 185; Foods 24 and 25; Woodwork 74; Psychology 123, 145.

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 students from requirements for a minor. Arrangements for practice teaching in the Nursery School (C.D. 175) should be made with Miss Porter; arrangements for practice teaching in the elementary grades (Ed. 106) should be made with Mrs. Shaw at the Whittier School. State requirements for certification include the following courses: Education 50, 103, 104, 105, 106, 114; Bacteriology 155; Psychology 108.

Courses required for completion of a major in Child Development and Parent Education are:

Junior Year		Senior Year	
	Cr.		Cr.
English 110 .....	4	C. D. 174, 175 and 190 .....	9
Psych. 105 .....	3	Household Adm. 149 and 150....	6
Zool. 111 .....	4	Ed. 105 .....	3
Bact. 155 .....	3	Ed. 106 .....	12
Psych. 108 (recommended) .....	3	Education Electives .....	2-3
Ed. 103 .....	4	Other Electives .....	18
Ed. 104 .....	3		50-51
Ed. 114 .....	3		
C. T. & R. A. 24 .....	3		
C. D. 138 .....	5		
Electives .....	16		
Total .....	51		

Elective Recommendations: Child Development 176; Woodwork 74; Sociology 160; C.T. & R.A. 115.

**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. S.) **Gardner; Aikin**

**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; should be preceded by or parallel C.D. 67. (3F, W. S.) **Porter**

**125. Parent Education.** Training for adult leadership and parent education. Basic principles in the organization of adult study programs, and formulation and presentation of programs for adults. Methods for promoting group participation. Analysis of subject matter and evaluation of source materials in terms of the needs of individual students. Participation in adult study groups required. (3 W, 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) **Porter**

**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, or S) **Porter**

**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 or S) **Staff**

**190. Seminar in Child Development.** Discussions and reports of current readings in Child Development. Open only to Child Development majors. (1S) **Staff**

## Clothing, Textiles, and Related Arts

**Florence Gilmore, Mignon Perry,** Assistant Professors; **Rhea Gardner,** Assistant Professor, Extension Home Furnishings Specialist; **Theta Johnson,** Assistant Professor, Clothing Specialist; **Effie Barrows,** Professor Emeritus.

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, 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: Clothing 4, 24, 115, 8 plus 5 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, and Home Decoration, and Fashion Merchandising.

A Master of Science degree is offered in Clothing, Textiles, and Related Arts.

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. Adm. 62, 63, 109, 149, 151, 152, 153, 156; Psy. 155; Art 1, 2, 3, 32, 110 and other art courses to complete a minor; Econ. 51.

**Costume Design**

Art 1, 2, 3, 110, 111, 132, 135.

**Education**

Majors in Clothing and Textiles who desire to teach in secondary schools should complete a double major of Vocational Home Economics and Clothing and Textiles.

**Textile Research**

Those preparing for textile research should complete a double major in Clothing, Textiles and Related Arts and Exact Science.

**Textile Design**

Those preparing to design textiles may wish to complete a double major of Clothing, Textiles and Related Arts and Art. The following courses in Art are required: Art 1, 2, 3, 32, 111, 127 and additional work to complete a major.

**Home Decoration**

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. Approximate cost, \$10.00. 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	
	Cr.		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. 165 .....	3	C.T. & R.A. 191 .....	2
English 110 .....	4	C.T. & R.A. 175* .....	3
Art Electives .....	5		18
Other Electives .....	27		
	51		

**4. Personal Development.** Orientation course in Home Economics. Open to all girls desiring assistance in enhancing their appearance, in planning and selecting college clothes, and in making adjustments to college life. Required of all Home Economics students in their first quarter. (2 F, W, S) **Perry**

**6. Construction Problems.** Open to all college girls who wish to develop skill in construction techniques. Construction of a blouse speed project and two dresses or equivalent. (3F. W. or S.) **Gilmore; Perry**

\* Given in alternate years; given in 1952-53.

**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 textiles from a consumer viewpoint and the construction of a speed project and a tailored dress. Required of all students majoring in Home Economics (5 F, W, or S) **Gilmore**

**15. Clothing Selection and Appreciation for men.** Men's apparel as related to the wearer. Consideration is given fundamentals of fabric selection. Organized to meet the needs of men from all schools of the college. (2 W) **Gilmore**

**24. Textiles.** A study of fibers, yarns, fabrics and finishes related to consumer problems. (3F, W, or S) **Gilmore**

**25. Clothing, Selection and Construction.** Consideration is given alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of design from a basic pattern. One garment is constructed with emphasis upon selection, fitting, good procedures and finishes. (3 F, or W) **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, curtains, lamp shades, use of sewing machine attachments, refinishing and upholstering furniture. Open to all college girls. (3 F, W, or S) **Staff**

**105. History of Costume.** Shows social economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. (3 F) **Perry**

**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 Education majors: Art 1 and 2; Clothing, Textiles, and Related Arts 4 and 8. Art and Clothing to satisfy the instructor for others. (3 F or W) **Perry**

**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 on dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles and Related Arts 25, 115. (5 W) **Perry**

**133. Home Decoration.** A laboratory course giving 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. (3 S) **Perry**

**140. Decorative Textiles.** Historic textiles including printed and hand woven textiles, tapestries, damasks, oriental rugs, and laces. Laboratory work consists of weaving, needlecraft, and various means of developing decoration for garments, accessories, and household furnishings. (3 W) **Perry**

**41, 141. 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. **Perry**

**165. Tailoring.** Application of techniques used in tailoring suits and coats. Prerequisite: Clothing, Textiles and Related Arts, 24, 25, 115. (3 F, W) **Gilmore**

**169. Newer Development in Textiles.** The latest fibers, fabrics and finishes. Taught in summer school only. Prerequisites: Clothing, Textiles and Related Art 24. (3 Su) **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. (3 S) **Perry**

**175. Textile Testing.** Physical and chemical properties of textiles, fibers, laboratory and household tests used in their identification, and application of these factors to choice and care of the fabrics. Consideration to use of 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; not offered in 1952-53. (3 S) **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. (3 F, S) **Perry**

**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. **Gilmore; Perry**

**191. Readings.** Reports and discussions on current literature in Clothing, Textiles, and Related Arts (2 F) **Gilmore**

**200. Commercial Clothing.** Experience in constructing garments for adult figures on a commercial basis with emphasis on speed, tailoring and dressmaking shop and alteration departments to study shop management. Prerequisites: Clothing, Textiles, and Related Arts 125, 165, and 170. (Not given in 1952-53) **Gilmore**

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

**Gilmore; Perry**

## Foods and Nutrition

**Ethelyn O. Greaves, Una Vermillion, Ethelwyn Wilcox,** Professors; **Edna Page, Priscilla Rowland,** Assistant Professors; **Margaret Merkeley,** Instructor; **Elna Miller,** Extension Nutritionist, Assistant 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 1; Physiology 4; Psychology 53; Economics 51; Sociology 70; Business Administration 109; Psychology 102 a and b; Education 120; Foods and Nutrition 182; Foods and Nutrition 183.

A Master of Science degree is offered in Foods and Nutrition.

Curriculum for Foods and Nutrition.

Junior Year		Senior Year		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 .....	3	
English 110 .....	4	F. & N. 191 .....	3	
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. (3 F, W or S) **Rowland**

**10. Nutrition and Food Preparation.** (For men) Nutritive value of foods; present-day problems in nutrition; selection of an optimal diet for health. Principles of food preparation and meal service. Open to men in all schools. Two lectures, one lab. (3 W) **Rowland**

**24. Food Selection and Preparation.** Principles of food selection and preparation. Open to all students. Two lectures, one demonstration and two 3-hour labs. (5, F, W, S) **Merkley; Page**

**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. Two 3-hour periods. (3 F, W, S) **Rowland**

**100. Quantity Food Preparation for School Lunch and Special Occasions.** Meets needs of Vocational Home Economics students. Emphasis on planning balanced school lunches and on organization, preparation, and service of foods in large quantities for special events. Prerequisite: Foods 24 (3 F) **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. (3 S) **Page**

**140. Advanced Nutrition.** Application of fundamentals of bio-chemistry to nutrition of man with practice in calculation of dietaries in health. Prerequisites: Biochemistry 90, 190 or equivalent. (3 F) **Wilcox**

**141. Advanced Nutrition.** Nutritional requirements of the mother during pregnancy and lactation; nutrition of the child through infancy to adolescence. (2 W) **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. (4 F) **Page**

**144. Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations. Prerequisites: Biochem. 190, or permission of instructor. (2 F) **Wilcox**

**145. Diet Therapy.** Application of dietetic principles to problems of disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. (4 W) **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 1; Foods 24. (3 F) **Greaves**

**160. Special Problems.** Open to qualified students majoring in Foods and Nutrition upon consultation with instructor. Any quarter. Time and credit arranged. **Staff**

**180. Quantity Food Preparation.** Principles of cooking applied to large quantity preparation, standardization of food quality and production cost. College cafeteria kitchen used as laboratory. Open to juniors majoring in dietetics or Institutional Management. (5 W) **Vermillion**

**182. Institutional Organization and Management.** Principles of scientific management applied to Food Service Units. Emphasis on forms of business organization, employer-employee relations, record keeping, and other management problems. (3 F) **Vermillion**

**183. Food Selection and Purchase for Institutions.** Consideration of sources, grading, standardization, basis of selection, methods of purchasing and storage of foods. A 2-day field trip to Ogden and Salt Lake markets and institutions. Approximate cost \$12.00. Prerequisites: 180 and 182. (3 S) **Vermillion**

**191. Seminar in Foods and Nutrition.** Reports, discussions, and review of recent scientific literature in nutrition. Prerequisite: Foods and Nutrition 141 or 142. (1 S) **Staff**

**201. Laboratory Methods in Foods and Nutrition.** Problems in Foods and human nutrition including nitrogen, mineral, and vitamin determination. Prerequisite: Chemistry 190 or 191, or equivalent. (3 F, W, or S) **Wilcox**

**202. Biological Assay of Foods.** Problems in biological assay of vitamins in foods (3 F, W, S) **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. (3 F, W, S) **Wilcox**

**207. Advanced Experimental Foods.** Development of experimental method and its application to cookery. Any quarter, time and credit arranged. **Page**

**210. Research for Master's Thesis.** Credit arranged. **Wilcox or Page**

**243. Recent Developments in Nutrition.** Study of problems in nutrition selected according to needs of students. Prerequisite: Nutrition 141. (3 F or W)

**260. Special Problems.** Open to graduate students in Foods and Nutrition. Any quarter; time and credit arranged. **Staff**

**291. Graduate Seminar.** Open to graduate students in Foods and Nutrition. Any quarter. Time and credit arranged. **Staff**

## Household Administration

**Ethelyn O. Greaves, Professor; Gwen T. Carlson, Instructor**

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying effects of social and economic forces on the home and its management.

Students majoring in Household Administration are required to take all the courses included in the Home Economics core; and in addition, H. Ad. 55, 65, 100, 149, 150; C.T. & R.A. 33, and 115.

To complete a minor, 18 additional credit hours are required.

Curriculum for Household Administration

Junior Year		Senior Year	
Home Economics	Cr.	Home Economics	Cr.
T. Ad. 149.....	3	H. Ad. 150 .....	4
H. Ad. 100 .....	2	C.T. & R.A. 115 .....	3
Electives .....	43	English 110 .....	4
	48	Electives .....	37
			48

**55. Family Finance.** Includes study of personal and family finance with emphasis on budgeting and investments. (2 F, W, or S) **Staff**

**65. Housing.** Present housing needs and practices affecting housing construction and home ownership. (3F, W, or S) **Carlson**

**49 or 149. Home Management.** (Core course) Principles of household management. Includes a philosophy of homemaking, use of human and material resources, and improvement of housing as it relates to family living. (3 F, W, or S) **Greaves**



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, 146; Clothing, Textiles and Related Arts 185; Sociology 160; 162, or 262.

### EXTENSION SERVICE CURRICULA

Requirements for entering the Agricultural Extension Service as County Home Demonstration Agents:

Completion of the Home Economics Education curriculum as outlined, and in addition:

Journalism 12 .....	3
Public Speaking 4 or 5 .....	5 or 3
Sociology 141 .....	3
Foods and Nutrition 146 .....	3
Extension Methods 151 .....	3

A 3-month training period in a county under supervision is required 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.) 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. (4W or S) **Cawley**

**Education 122. Student Teaching in Home Economics.** Observation and teaching of homemaking under supervision in public schools having co-operative arrangement with College. Student teachers leave campus the middle five or six weeks of Fall, Winter or Spring quarter and teach 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 in Spring. Prerequisites: Ed. 120, 121. (8F, W, S) **Cawley**

**Education 123. Student Teaching in Home Economics for Non-Vocational Education Majors.** For student dietitians whose responsibilities will involve teaching student nurses, student dietitians, and patients. For other non-vocational homemaking majors interested in securing practical teaching experience. In Spring the student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120 with Ed. 121 taken the same quarter as Ed. 123. (4S) (This course does not fulfill requirements for Vocational Homemaking Certificate.) **Staff**

**Field Trip.** For senior girls and graduate students enrolled in homemaking education. Planned co-operatively by students and Homemaking Education staff. Trip is usually taken in Spring Quarter, and estimated cost to participants is given in advance.

**Home Economics 199. Special Problems in Home Economics Education.** Developed around individual needs of students not otherwise provided for in curriculum. (1-2F, W or S) **Staff**

**Home Economics 210. Research for Master's Thesis.** Credit arranged.  
Cawley

**Seminar. Home Economics Education 237.** Opportunity for investigation and reporting on individual problems.  
Cawley

### 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 .....	2
Education 113 .....	3
Child Development 67 .....	5

#### Group II

Six credits in understanding the school.

*Education 114 .....	3
†Education 111 or 112 .....	3
(Educ. 112 is usually blocked with Educ. 121.)	

#### Group III

Fifteen credits in Student Teaching, including methods.

*Education 120 .....	3
*Education 121 .....	4
*Education 122 .....	8

A total of thirty-three credits in professional education, including Public Health 155, must be presented to meet the requirements. 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 122a.

†Required courses.

# MILITARY AND AIR SCIENCE AND TACTICS

## Army and Air Force

COLONEL KARL C. FRANK, Coordinator

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## General Information

Karl C. Frank, Colonel, Arty, Professor of Military Science and Tactics, Coordinator of ROTC affairs; Professor of Air Science and Tactics; Leonard M. Johnson, Lt. Colonel QMC, Assistant Professor of Military Science and Tactics, Director QMC, Executive and Adjutant; Arthur L. MacKusick, Lt. Colonel Ordnance Corps, Assistant Professor of Military Science and Tactics, Director, Ordnance Corps; Jack A. Rogers, Lt. Colonel, Artillery, Assistant Professor of Military Science and Tactics, Director, Artillery; Alfred Kaufman, Major, USAF, Assistant Professor of Air Science and Tactics; Avery C. Bruce Jr., Major, USAF, Assistant Professor of Air Science and Tactics, Director AF Administration; Irvan J. Church, Major, USAF, Assistant Professor of Air Science and Tactics; Gaston M. Hensley, Major, USAF, Assistant Professor of Air Science and Tactics, Director AF Operations; Ferdinand F. Sawyer, Major, QMC, Assistant Professor of Military Science and Tactics; Russell V. Foster Jr., Captain, USAF, Assistant Professor of Air Science and Tactics, Director AF Communications; Henry J. Garden, Captain, QMC, Assistant Professor of Military Science and Tactics; James W. Grier, Captain, USAF, Assistant Professor of Air Science and Tactics; Robert L. Howard, Captain, USAF, Assistant Professor of Air Science and Tactics, Director AF Basic; James L. Yacavone Jr., Captain, QMC, Assistant Professor of Military Science and Tactics; William G. Giel, First Lt., USAF, Assistant Professor of Air Science and Tactics; Owen E. Litz, First Lt., Ordnance Corps, Assistant Professor of Military Science and Tactics; John L. Owen, Army, Assistant Professor of Military Science and Tactics; James M. Callan, WOJG, USAF, Instructor Air Science and Tactics, AF Admin NCO; William B. Hayes, M/Sgt., USAF, Instructor Air Science and Tactics; Frank E. Hoard, M/Sgt., USAF, Instructor Air Science and Tactics; William E. James, M/Sgt., USAF, Instructor Air Science and Tactics, Admin NCO; Norman F. Jones, M/Sgt., USAF, Instructor Air Science and Tactics; Samuel L. Packman, M/Sgt., AGC, Instructor Military Science and Tactics, Department Sgt. Major; Carl H. Timmerman Jr., M/Sgt., USAF, Instructor Air Science and Tactics, AF Sgt. Major; Ira R. Allen, T/Sgt., USAF, Instructor Air Science and Tactics; Thomas E. Henderson, M/Sgt., Artillery, Instructor Military Science and Tactics, QMC NCO; Jack E. Howard, SFC, AGC, Instructor Military Science and Tactics, QMC NCO; Charles J. Perkins, T/Sgt., USAF, Instructor Air Science and Tactics, AF Supply Sgt.; Siegfried Stahlschmidt, M/Sgt., Infantry, Instructor Military Science and Tactics, Army Supply Sgt.; Gordon H. Adkins, Sgt., Artillery, Instructor Military Science and Tactics, Army Tng Aids NCO; Frederick H. Hirsch, Sgt., AGC Instructor Military Science and Tactics, Artillery Adm. NCO; Ralph G. Smith, Ordnance Corps, Instructor Military Science and Tactics, Ord Admin NCO; John P. Dalby, Instructor in Music, Instructor ROTC Band.

**S**INCE UTAH STATE AGRICULTURAL COLLEGE is classified as a Land-Grant College, it is obliged to offer a course in Military and Air Science and Tactics as a part of the College curricula. Obligations on Land-Grant institutions by the Act of July 2, 1862, to provide military instruction are not altered by the National Defense Act of 1920 as amended.

As preparation for national defense is an important duty of citizenship, it has been the constant policy of the College to cooperate with the Federal Government in making the Department of Military and Air Science and Tactics as effective as practicable.

At the request of College authorities, a senior unit of the Reserve Officers' Training Corps was authorized at this Institution by the President of the United States under provisions of Section 33 of the Army reorganization Act of June 4, 1920. Accordingly, the Board of Trustees has agreed to maintain a two-year basic course in Military and Air Science and Tactics as a required subject for all qualified male students except transfer students from a college which has no ROTC unit who are Junior or Senior students.

Juniors and Seniors may, if less than 25 years of age, elect to take the basic course even though sufficient time is not available to complete the advanced course and receive a commission.

The primary object of establishing units of the Reserve Officers' Training Corps is to qualify students for appointment in the Officers' Reserve Corps of the United States Army and Air Force, and also for commissions in the Regular Army and Air Force as "Distinguished Military Graduates." This training will also be as valuable to the student in his industrial or professional career as it would be should the nation call upon him to act as a leader in its defensive forces.

Enrollment in the Reserve Officers' Training Corps is not "conscription." As its name implies, the R. O. T. C. is an instrument of training and instruction only. Present Regulations provide that certain students may be deferred from Selective Service provided that they meet the standards of the Military Science Department and execute a Deferment Agreement. This policy is subject to change without notice.

### **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 Officers' Training Corps. These requirements are: Two years of military training (six credits) are required of all qualified male students. By regulations of the College, the basic course is normally required during the first and second years at the Institution.

To receive instruction at the College or to graduate from the College, the student must attend military classes and receive passing grades in each of them. 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 with the regulations regarding Military or Air Science rests entirely with the student.

The 11 a.m. hour on Thursday is reserved exclusively for Military Drills. No classes are allowed to conflict with this hour.

A student claiming exemption from Military or Air Science must present a petition for such excuse at the time of registration. Pending the action of the petition, the student registers for the course prescribed and enters the work of that course.

Any student excused from attendance in Military or Air Science for any valid reason must make up this deficiency in other departments of study.

Every student registered for Military or Air 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.

### **Reserve Officers' Training Corps**

The four-year course in the Reserve Officers' Training Corps is divided into the Basic Course and the Advanced Course.

The Basic Course consists of the first two years in Military or Air Science and normally corresponds to the freshman and sophomore years. When entered upon by any student it shall be a prerequisite for his graduation unless he is relieved from this obligation by proper authority. Lower Division students (freshmen and sophomores) transferring from institutions not having ROTC units must enroll and continue the basic course while in a lower division status.

The Advanced Course consists of the third and fourth years of Military or Air Science. Entrance upon the Advanced Course is elective, but once entered upon, it becomes a prerequisite for graduation, unless the student shall be honorably discharged in accordance with provisions of Army Regulation 145-350, or Air Force Manual 45-2.

A student electing 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 Advanced Course. The School of Arts and Sciences offers a major\* in Military or Air Science.

### Uniforms and Equipment

An officer type uniform of standard pattern is furnished by the Department of Defense to each student taking military training.

The uniform and equipment issued for the use of a student remain the property of the United States. At the end of each year, or at such other times as students may terminate their military training, all clothing and other supplies must be returned in serviceable condition, not later than one week following the termination of such training. Articles which have been lost, damaged, or destroyed are charged against the student.

Any student not returning the previously mentioned uniforms and equipment or not paying for articles shall have suspended all college credit earned at this institution until the debt to the college is liquidated.

### BASIC COURSES

Students in the Basic Course are required to pursue their courses diligently until satisfactorily completed and to meet prescribed requirements for care of equipment. In case of failure in any quarter, the student is required to repeat the work.

**General conditions for enrollment in the ROTC.** All students formally enrolled in the Basic and Advanced Course of the Senior Division ROTC must be:

1. Citizens of the United States.
2. Physically qualified, under standards prescribed by the Departments of the Army and Air Force (see AR 40-105). Due allowance is made for defects which are correctable before the student, who is otherwise qualified, becomes eligible for appointment as a commissioned officer.
3. Accepted by the institution as a regularly enrolled student.

In addition to the general conditions for enrollment in the ROTC enumerated above, all students formally enrolled in the Basic Course must comply with the specific conditions listed below:

1. Be not less than 14 years of age and not more than 23 years of age at the time of **initial** enrollment in the **Basic Course**.
2. Successfully complete any prescribed general survey or screening tests.

### ADVANCED COURSE

In addition to the general conditions for enrollment in the ROTC enumerated above under "Basic Courses," all students formally enrolled in the Advanced Course ROTC must comply with these conditions:

1. Not have reached 27 years of age at the time of initial enrollment in the Army advanced course or not have reached 25 years of age at the time of initial enrollment in the Air Force Advanced course. Veterans may be granted extensions of this Air Force age requirement.
2. Successfully complete such survey and general screening tests as prescribed.
3. Be selected by the PMS&T or PAS&T and the head of the institution.

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\*See insert to section for School of Arts and Sciences for Major in Military and Air Science subjects.

4. Execute a written agreement with the Government.
5. Have completed the Basic course or equivalent thereof.
6. Be enrolled in an academic course prescribed by the chief of a technical service if admission to the Advanced Course in a unit of a technical service is desired.
7. Be in good Academic standing in the college.

#### **Credit for Previous High School, Junior Division, ROTC Training**

Credit is allowed for work completed in the Junior Division ROTC. This does not obviate the college requirements of six quarters of Military or Air Science or Physical Education; so it may be used in lieu of three quarters thereof.

#### **Credit for active military or naval service in lieu of the Basic Course, R.O.T.C.**

Veterans who have been honorably discharged, or transferred to the Enlisted Reserve Corps and relieved from active duty, are given credit under the provisions of Public Law 81—79th Congress, in lieu of completion of all or part of the basic course, R.O.T.C.

**Contracts.** Separate contracts are executed between the Government and students enrolled in the Advanced Course. These contracts require a student to complete the Advanced Course of training and to attend the Advanced Camp at the time specified unless he is sooner discharged for the convenience of the Government. The contract does not specify that the Advanced Course must be pursued without interruption. However, the contract is cancelled if the Advanced Course is interrupted for two calendar years. During their period of participation in the advanced Course, duly enrolled students are paid a monetary allowance in lieu of subsistence at a daily rate equal to the value of the commuted ration. This allowance is not subject to income tax.

**Summer Camp.** Students attending ROTC summer camp are messed and quartered, and are paid at the rate prescribed for soldiers of the 1st grade. A travel allowance from the institution to camp and return to the institution at the rate of 5 cents a mile is authorized students eligible to attend the advanced summer ROTC camp.

#### **R. O. T. C. Band**

A military band is an element of the Reserve Officers' Training Corps, under the direction of the Band Instructor, and is governed by the rules of the Department of Military and Air Science and Tactics. Instruments are furnished by the Department of Defense.

Students selected for the band are required to take all theoretical work in Military and Air Science and sufficient practical drill to insure making a creditable appearance in ranks. They play in the band at regular drill formations.

Students satisfactorily completing the Basic Course receive one credit per quarter, which may be included in the 186 credits required for graduation.

#### **Credits**

Students satisfactorily completing the Basic courses receive one credit per quarter and those satisfactorily completing the Advanced Courses receive three credits per quarter, which count toward the 186 credits required for graduation. In addition, students enrolled in the Advanced Course will receive six credits for satisfactory completion of the six weeks' course at the Advanced Camp, conducted annually and normally attended after completion of the first year of Advanced Course. If the length of the summer camp is increased, the credits allowed for summer camp will be increased accordingly, on the basis of one credit for each additional week, up to a total of nine weeks.

For students desiring a major in Military or Air Science, at least 6 credits of Military Science Seminar are required. Other members of the Advanced Course may take seminar with the approval of the PMS&T or PAS&T. Research work to be done in military history, tactics, strategy, logistics, development of weapons, evolution of warfare, and related fields. Practical work to be done in motors, supply, administration, etc., with the members of the staff.

Students majoring in the Schools of Arts and Sciences, and Engineering may submit Advanced Military or Air Science as a minor for graduation.

Members of the band who successfully complete the work in the various quarters receive credits as follows: First and second years, one credit per quarter in Military or Air Science.

### **Courses of Instruction**

Classes in Military or Air Science are not held at times other than as scheduled, but any student desiring extra instruction may make the necessary arrangements with the Professor of Military Science and Tactics or Professor of Air Science and Tactics.

## **DEPARTMENT OF MILITARY SCIENCE AND TACTICS**

**Colonel Karl C. Frank, PMS&T**

### **BASIC COURSES**

**1, 2, 3. Military Science.** First Year. These courses follow the program of instruction for Military and Civilian Colleges laid down in Department of the Army Training Program ATP 145-1, dated 10 February 1949, as amended. They include the following subjects: military organization, military Policy of the United States, National Defense Act and ROTC, evolution of warfare, maps and aerial photographs, first aid and hygiene, individual weapons and marksmanship, military problems of the United States.

Emphasis is placed on teaching skills necessary to individual survival in the field.

Leadership, drill, and exercise of command. (1F, 1W, 1S)

**Staff**

### **ARTILLERY SECTION**

#### **MILITARY SCIENCE II—SECOND YEAR BASIC ARTILLERY**

##### **4, 5, 6. Military Science, Antiaircraft Artillery.**

These courses follow the Program of Instruction for Military Science II, as laid down in the Army Training Program 145-1, dated 10 February 1949, as amended, and contain 90 hours of instruction as listed below:

a. Leadership Drill and Exercise of Command, 30 hours. Emphasis in this course is placed on developing qualities of leadership.

b. Introduction of branch technique, 60 hours, including: introduction to antiaircraft artillery automatic weapons; characteristics, capabilities and limitations of automatic weapons; service of the piece—automatic weapons fire unit; introduction to antiaircraft artillery guns; characteristics, capabilities and limitations of 99 mm guns; and service of the piece—90 mm. Individual weapons and marksmanship. (1F, 1W, 1S)

**Henderson**

#### **MILITARY SCIENCE III—FIRST YEAR ADVANCED ARTILLERY**

##### **101, 102, 103. Military Science, Antiaircraft Artillery.**

These courses follow the Program of Instruction for Military Science III, as laid down in the Army Training Program 14-1, dated 10 February 1949, and contain 150 hours of instruction as listed below:

a. Leadership Drill and Exercise of Command, 30 hours. To emphasize developing the qualities of leadership in students, the Corps of Cadets is formed into a brigade to give as many students as possible the opportunity for command positions.

b. Branch tactics and technique, 120 hours, including: antiaircraft artillery tactics, basic gunnery, communications, individual weapons and marksmanship, motors and transportation, organization, and troop movements.

These subjects teach the latest developments and trends in AA units of all echelons. Direct contact is maintained with the Antiaircraft and Guided Missiles School at Fort Bliss, Texas, headquarters of new developments in this field. Latest materials and training aids are available to supplement instruction by experienced, capable officers, all combat veterans of World War II. The ultimate goal of this course is a Commission in the Officer's Reserve Corps, or a career and Commission in the Regular Army through the "Distinguished Military Graduate" program. (3F, 3W, 3S)  
Rogers, J. A.

#### **MILITARY SCIENCE IV—SECOND YEAR ADVANCED ARTILLERY**

##### **104, 105, 106. Military Science, Antiaircraft Artillery.**

These courses follow the program of Instruction for Military Science IV, as laid down in the Army Training Program 145-1, dated February 1949, and contain 150 hours of instruction as listed below:

a. Leadership Drill and Exercise of Command, 24 hours. This course emphasizes development of leadership. A maximum number of students is given command and staff positions affording a great deal of experience in Regular Army procedures.

b. Common subjects, 40 hours, including: Military Administration, Military Law, Military Teaching Methods, and Psychological Warfare.

c. Branch tactics and technique, 80 hours, including: antiaircraft artillery material; antiaircraft artillery tactics, advanced; command and staff; combat intelligence; gunnery; the military team; new developments supply and evacuation; field artillery, capabilities and employment; and geographical foundations of national power.

These subjects are concerned with latest developments and trends in AA Units of all echelons, taught by veteran instructors. Direct contact is maintained with the Antiaircraft Artillery and Guided Missile School at Fort Bliss, Texas, and the White Sands Proving Ground, New Mexico, to insure the latest information on new developments. The best that the Army has to offer is available in the way of training aids and materials are available to supplement instruction. The ultimate goal of this course is a Commission in the Officers' Reserve Corps, or a career and Commission in the Regular Army through the "Distinguished Military Graduate" program. (3F, 3W, 3S)  
Rogers, J. A.

#### **Advanced Artillery Summer Camp**

**100. Military Science, Antiaircraft Artillery Summer Camp.** Six weeks of summer training at an army installation. Practical training is carried out under guidance of experienced officers and men of the Regular Army. It consists of work on the latest types of equipment. Normally taken between the two academic years of the Advanced Course. This may, however, for other academic reasons (Civil Engineering Camp, Forestry Camp or Summer School) be postponed for one summer (6)  
Rogers

#### **Advanced Military Science Seminars**

**174, 175, 176. Advanced Military Science Seminar.** Artillery. Prerequisite: enrollment in (or completion of) advanced artillery course, and approval of PMS&T and Branch Director. Field Artillery Tactics and Techniques, Fire Direction, Observer Procedure. Credits and Hours to be arranged.  
Rogers

**201. Advanced Military Science Seminar.** Guided Missiles Tactics and Techniques. Prerequisites: same as MS 174, 175, 176, with any of which this course may be taken concurrently. Credits and Hours to be arranged.  
Beckett

## QUARTERMASTER SECTION

### MILITARY SCIENCE II—SECOND YEAR BASIC QUARTERMASTER

#### 14, 15, 16. Military Science, Quartermaster.

The object of these courses is to provide ROTC students with an introduction to Quartermaster tactics and techniques. The combined courses offer 90 hours of instruction in the following subjects: leadership, drill and exercise of command; organization for supply in the Army; organization and functions of the Quartermaster Corps; classification of supplies; research and development; functions and operations of Quartermaster Units; and Units and Organization Supply. (1F, 1W, 1S) **Garden**

### MILITARY SCIENCE III—FIRST YEAR ADVANCED

#### QUARTERMASTER

#### 111, 112, 113. Military Science, Quartermaster.

These courses are designed to acquaint ROTC cadet officers with the fundamental knowledge that is required of an Army officer in the performance of various types of Quartermaster supply and service activities. Close liaison is maintained with the office of the Quartermaster General and the Quartermaster Technical Training Service, Fort Lee, Virginia, which provides information on the latest developments and techniques in Army supply and service. The three courses offer 150 hours of instruction in the following subjects: leadership, drill and exercise of command; station supply; depot supply; storage and warehousing; procurement, storage and distribution of petroleum products; commissary operations; garrison and field bakery operations; post and field laundry operations; food service activities; maintenance and reclamation of Quartermaster supplies; and individual weapons and marksmanship. (3F, 3W, 3S) **Richardson**

### MILITARY SCIENCE IV—SECOND YEAR ADVANCED

#### QUARTERMASTER

#### 114, 115, 116. Military Science, Quartermaster.

These courses are arranged to give Senior Cadet Officers training in leadership and provide them with a clear understanding of the organization, functions and procedures of the Quartermaster Corps. Satisfactory completion of these and all prerequisite courses will qualify cadet officers for appointment as 2nd Lieutenant, in the Officers' Reserve Corps of the Army of the United States or in the Regular Army. 150 hours' instruction is given in subjects common to all branches of the Army and in tactics and technique of the Quartermaster Corps.

Common subjects, consisting of 70 hours, are designed to develop leadership qualities in the student. Principal subjects are: leadership, drill and exercise of command; military administration; military law and boards; and military teaching methods.

Quartermaster subjects, consisting of 80 hours, are closely related to courses offered by the School of Commerce, the School of Agriculture and some departments of the School of Arts and Sciences. Principal subjects offered are: fiscal procedures, procurement procedures, command and staff, organization and functions of combat arms, organization and functions of technical services, Quartermaster operations in the zone of interior, and Quartermaster operations in the theatre of operation.

Cadet officers who have high standing in military subjects and have demonstrated both an outstanding quality of leadership and a definite aptitude for military service are designated Distinguished Military Students and thereby are qualified to make application for a direct Army commission. (3F, 3W, 3S) **Johnson**

### Quartermaster Summer Camp

#### 110. Military Science, Quartermaster Summer Camp.

The Quartermaster Summer Camp consists of six (6) weeks' practical training under regular army officers at Fort Lee, Virginia. All training is under field conditions utilizing the latest equipment developed.

Attendance at Summer Camp is required of all advanced course students the first summer after registration in the advanced course. Postponement to the following summer is authorized only for academic reasons. Six (6) credit hours are given for satisfactory completion of the camp training.

Johnson

### ORDNANCE SECTION

The Ordnance Corps of the Army is the Technical Service responsible for the design, procurement, supply and maintenance of "fighting" equipment, including all types of automotive vehicles, tanks, small arms, ammunition, artillery, fire control material, and supply of spare parts for this equipment. Field (Intermediate Level) Maintenance of Army Light Liaison aircraft is now also part of the Ordnance Corps. The goal of the Ordnance ROTC student is a commission in Ordnance in the Reserve Officers' Corps, or a lifetime career as a Regular Army Ordnance officer through the "Distinguished Military Graduate" program.

Usually students in the School of Engineering and Technology, especially those in the Division of Technology, are well suited educationally for enrollment in Ordnance ROTC. Subjects such as mathematics and physics are helpful to an Ordnance officer.

Enrollment in Ordnance is not limited to students in the School of Engineering and Technology, but a cadet enrolling in Ordnance should have some natural interest or aptitude for items such as guns or vehicles, or be somewhat mechanically inclined.

#### MILITARY SCIENCE II—SECOND YEAR BASIC ORDNANCE

##### 84, 85, 86. Military Science, Ordnance.

These courses follow the program of instruction for Military Science II, Ordnance, outlined in the Army Training Program 145-1, dated 10 Feb. 1949, and contain 90 hours of instruction as listed below:

- a. Leadership, Drill and Exercise of Command ..... 30 hours  
This course emphasizes development of qualities of leadership important in all phases of the student's life, whether civilian or military.
- b. Introduction to Branch Technique, 60 hours, includes: Role of Ordnance, Small Arms Materiel, Ammunition Materiel, Artillery Materiel, Fire Control Materiel, Automotive Materiel, and Individual Weapons and Marksmanship. 1F, 1W, 1S Litz

#### MILITARY SCIENCE III—FIRST YEAR ADVANCED ORDNANCE

##### 181, 182, 183. Military Science, Ordnance.

These courses follow the program of instruction for Military Science III laid down in Army Training Program 145-1 dated 10 Feb. 1949, and contain 150 hours of instruction as listed below:

- a. Leadership, Drill and Exercise of Command, 30 hours.  
Emphasizes development of qualities of leadership. The Corps of Cadets is formed into a Brigade to give as many students as possible the opportunity for command positions.
- b. Branch Tactics and Techniques, 120 hours, includes:  
Functional Organization of Ordnance Corps, Automotive Materiel, Small Arms Materiel, Ammunition Materiel, Ammunition Supply, Artillery Materiel, Fire Control Materiel, and Individual Weapons and Marksmanship. ((3F, 3W, 3S) MacKusick

**MILITARY SCIENCE IV—SECOND YEAR ADVANCED****184, 185, 186. Military Science, Ordnance.**

These courses follow the program of instruction for Military Science IV laid down in the Army Training Program 145-1, dated 10 Feb. 1949, and contain 150 hours of instruction as follows:

a. Leadership, Drill and Exercise of command, 30 hours.

Emphasize development of the traits of leadership. The units are formed into a Cadet Brigade in which the cadet officers direct and supervise all activities. A maximum number of students are given command and staff positions so that they receive a great deal of experience in Regular Army procedures.

b. Common subjects, 40 hours, including:

Military Administration, Military Law, Military Teaching Methods, and Psychological Warfare.

Contents of these courses are applicable to all Arms and Services.

c. Branch Tactics and Techniques, 80 hours, includes:

Maintenance and Supply, Command and Staff, Combat Intelligence, and Materiel Specialty. (3F, 3W, 3S) **MacKusick**

**DEPARTMENT OF AIR SCIENCE AND TACTICS****AIR SCIENCE I—FIRST YEAR BASIC AIR FORCE**

**11, 12, 13. Air Science.** This freshman course is offered to acquaint the student with the world political situation as it relates to American foreign policy and with the part played by the armed forces of the United States in the world political situations.

Emphasis is placed on the commitments of the United States Air Force in order that the student will understand why air bases are built where they are and why the Air Force is interested in global geography. A third of the course deals with the foundations of national power and the factors which lead to a nation's power in the international scene. (1F, 1W, 1S)

**Howard****AIR SCIENCE II—SECOND YEAR BASIC AIR FORCE**

**24, 25, 26. Air Science.** Gives the student a general non-technical knowledge of the functions of the Air Force, and includes: leadership, drill, and exercise of command; instruction in applied air power; aerodynamics and propulsion; aerial navigation; meteorology; and defense of the United States. (1F, 1W, 1S)

**Howard****AIR INSTALLATIONS OPTION****AIR SCIENCE III—FIRST YEAR ADVANCED AIR INSTALLATIONS****121, 122, 123. Air Science, Air Installations.**

This course contains 150 hours of instruction, divided into two phases: the common courses that cover leadership, drill, and exercise of command; and psychology of leadership; air operations; logistics; and the second phase, which teaches an understanding of ventilation, refrigeration, air conditioning, grounds maintenance, utilization of fuels, design of runways, roads and railroads, operations procedures for sewage disposal and treatment, principles of water supply and treatment, fire prevention and aircraft practices as concerned with an Air Force Base. This course, especially well suited to Civil Engineering majors, offers them practical training in their subject both in college and on active military service. (3F, 3W, 3S)

**Kaufman****AIR SCIENCE IV—SECOND YEAR ADVANCED AIR INSTALLATIONS**

**124, 125, 126. Air Science, Air Installations.** This course contains 150 hours of instruction divided into two phases: the common courses that cover leadership, drill and exercise of command; military administration;

inspector general; military teaching methods; military law and boards; AF management; career development; and the second phase, which teaches an understanding of electrical facilities; insect and rodent control; refuse disposal; buildings and structures; cost accounting; real estate facilities; preventive maintenance; project requests; master planning; and Air Installations supply procedures. (3F, 3W, 3S) **Kaufman**

### **AIR INSTALLATIONS SUMMER CAMP**

#### **120. Air Science, Air Installations Summer Camp.**

The Air Force Summer Camp consists of six (6) weeks of practical training at an established Air Force Base. This camp is conducted by regular Air Force officers and offers the cadet training with the 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 summer school or summer school camps, such as Forestry or otherwise. In this case, the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flight while attending ROTC Summer Camp. (6 Su) **Kaufman**

### **AIR ADMINISTRATION AND LOGISTICS OPTION**

#### **AIR SCIENCE III—FIRST YEAR ADVANCED AIR ADMINISTRATION AND LOGISTICS**

##### **131, 132, 133. Air Science, Air Administration and Logistics.**

This course gives the student fundamental training in procedures of administration and logistics. The information given in this course is valuable in a career in the Air Force, or may be used to advantage in such civilian occupations as personnel manager, business manager, buyer, executive, stock comptroller, procurement chief, store manager, and cost accounting.

The common course requires 50 hours of class attendance and provides instruction in the following; Leadership, Drill and Exercise of Command; Psychology of Leadership; Air Operations and Logistics. (3F, 3W, 3S) **Bruce**

#### **AIR SCIENCE IV—SECOND YEAR ADVANCED AIR ADMINISTRATION AND LOGISTICS**

##### **134, 135, 136. Air Science, Air Administration and Logistics.**

This course contains 150 hours of instruction. This is divided into two phases. One phase is the common courses that cover leadership, drill and exercise of command; military administration; inspector general; military teaching methods; military law and boards; AF management; and career development.

The second phase teaches an understanding of Air Force Administration and Logistics on a staff level. (3F, 3W, 3S) **Bruce**

### **AIR ADMINISTRATION AND LOGISTICS SUMMER CAMP**

#### **130. Air Science, Air Administration and Logistics Summer Camp.**

The Air Force Summer Camp consists of six (6) weeks of practical training at an established Air Force Base. This camp is conducted by regular Air Force officers and offers the cadet training with the 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 summer school or summer camps, such as Forestry or otherwise. In this case, the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flight while attending ROTC Summer Camp. (6 Su) **Bruce**

**AIR COMMUNICATIONS OPTION****141, 142, 143. Air Science, Air Communications.**

The Air Communications course covers fundamentals of electricity, organization of Air Force Communications, wire communications, radio, radar, supply and maintenance, visual communications, and other pertinent subjects.

This course contains 150 hours of instruction. This is divided into two phases. One phase is the common courses that cover leadership, drill and exercise of command; psychology of leadership; air operations; and logistics.

The second phase gives the students an understanding of wire communications, radio communications, radar, visual communications, and communication supply, and maintenance, and is particularly well suited to Electrical and Radio Engineering majors as it offers them practical training in their subject both in college and on active military service. (3F, 3W, 3S) **Foster**

**144, 145, 146. Air Science, Air Communications.**

This course contains 150 hours of instruction. This is divided into two phases. One phase is the common courses that cover leadership, drill and exercise of command; military administration; inspector general; military teaching methods; military law and boards; AF management; and career development.

The second phase teaches the student an understanding of Air Communications, administrative practices, duties of communications officers, and message center procedures. (3F, 3S, 3W) **Foster**

**AIR COMMUNICATIONS SUMMER CAMP****140. Air Science, Air Communications Summer Camp**

The Air Force Summer Camp consists of six (6) weeks of practical training at an established Air Force Base. This camp is conducted by regular Air Force officers and offers the cadet training with the 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 summer school or summer school camps, such as Forestry or otherwise. In this case, the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flight while attending ROTC Summer Camp. (6 Su) **Foster**

**FLIGHT OPERATIONS OPTION****191, 192, 193. Air Science, Flight Operations.**

This course contains 150 hours of instruction. This is divided into two phases. One phase is the common courses that cover leadership, drill, and exercise of command; psychology of leadership; air operations; and logistics.

The second phase teaches an understanding of Major Air Commands; Principles of Flight; Introduction to Instruments; navigation; meteorology; and aircraft engineering. This course is designed to provide instruction which will facilitate and materially augment the academic phases of training in the flying schools of the Air Training Command. (3F, 3W, 3S) **Hensley**

**194, 195, 196. Air Science, Flight Operations.**

This course contains 150 hours of instruction. This is divided into two phases. One phase is the common courses that cover leadership, drill and exercise of command; military administration; inspector general; military teaching methods; military law and boards; AF management; and career development.

The second phase is designed to offer advanced instruction in navigation and bombing to include the theory of radar as applied to both. Instruc-

tion will cover, in general, the duties and responsibilities of an electrical countermeasures officer and radar observer. (3F, 3W, 3S) **Hensley**

### FLIGHT OPERATIONS SUMMER CAMP

#### 190. Air Science Flight Operations Summer Camp.

The Air Force Summer Camp consists of six (6) weeks of practical training at an established Air Force Base. This camp is conducted by regular Air Force Officers and offers the cadet training with the 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 summer school or summer school camps, such as Forestry or otherwise. In this case, the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flight while attending ROTC Summer Camp. (6 Su) **Hensley**

### SPONSOR CORPS COURSES

**51, 52, 53. Military Science Sponsor Drill.** Freshman year. A drill course for girls elected to Corps of Sponsors. (1F, 1W, 1S) **Grier**

**54, 55, 56. Military Science.** Sponsor Drill. (1F, 1W, 1S) **Grier**

**151, 152, 153. Military Science.** Sponsor Drill. (1F, 1W, 1SS) **Grier**

**154, 155, 156. Military Science.** Sponsor Drill. (1F, 1W, 1S) **Grier**

**171, 172, 173. Air Science Seminar.**

Prerequisite: Enrollment in Advanced AROTC or a graduate of AROTC. This course is devoted to study of the duties of an Air Force officer at squadron level. (Credits Arranged) **Staff**

### R. O. T. C. BAND COURSES

**1B, 2B, 3B. R.O.T.C. Band.** First Year. (1F, 1W, 1S) **Richardson**

**4B, 5B, 6B. R.O.T.C. Band.** Second Year. (1F, 1W, 1S) **Richardson**

### MARKSMANSHIP COURSES

Men's Rifle Team — Basic and Advanced Marksmanship Techniques,  
Team Competition with other institutions.  
Men's Pistol Team — Basic and Advanced Marksmanship Techniques,  
Team competition with other institutions.  
Girl's Rifle Team — A basic course in marksmanship.

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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 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 as necessary among the various College buildings.

Greenhouses are maintained for investigations in horticulture, vegetable crops, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the Branch Agricultural College, at the U. S. Forest Service Desert Range Station, at the Benmore Experiment Range in Tooele County, and on the ranges in different parts of the state.

The Station also maintains the following experimental farms:

**The Dairy Experimental Farm**, including about 130 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.

**The Greenville Farm**, a 45-acre tract, is used for experimental work in plant breeding and other phases of crop production.

**The Farmington Field Station** at North Farmington is a 57-acre tract used for experimental work in horticulture and vegetable crops.

**The Nephi Farm** is used for experimental work in dry farming and range seeding. This farm has 103 acres.

**The Forage Experiment Farm**, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering, for study of improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

**The Howell Field Station for Horticulture Research**, located in Weber County north of Ogden, is a 71-acre tract used for investigation in fruit production.

**The Poultry Experimental Farm**, a new farm in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.

**The Turkey Experimental Farm** is a new 33-acre farm east of the Campus used for studies in turkey breeding, nutrition, and disease control.

**The 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.

**The 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, Vegetable Crops, 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 aim of the U. S. Department of Agriculture. Its agricultural and home demonstration agents serve in practically every county. Cooperating with the agents is a state staff of specialists in agricultural

economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, cattle marketing, 4-H Club work, clothing, consumer education, dairy, 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.

## EXTENSION CLASSES, HOME STUDY

L. G. Noble, Supervisor

The department of Extension Class Work and Home Study courses 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-fifth of the credits necessary for a degree (37) 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

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

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

**C. D. McBride, Supervisor**

The Evening School is designed to meet the needs of busy people in all walks of life whose duties prevent them from attending classes during the day. Classes are open to all adults who can profit by them regardless of previous schooling. A close working relationship is maintained between the school and the occupational activities and needs of the area to keep the Evening School program abreast of the needs and interests of the people.

### WHEN HELD

Evening School is held four evenings, during the week: Monday, Tuesday, Wednesday, Thursday, from 7 to 10 p.m. Two class schedules are provided, each operating two evenings a week. Classes in one schedule are held on Monday and Wednesday, and in the other schedule on Tuesday and Thursday. This makes it possible to attend evening classes two evenings or four evenings a week as desired.

Lecture classes are held 1½ hours, from 7 to 8:30, and from 8:30 to 10. Combination lecture and laboratory classes are held three hours, from 7 to 10. This makes it possible to register for 2 classes or one combination lecture and laboratory class.

Four quarters of Evening School are held each year, Fall, Winter, Spring, and Summer.

### FEES

Registration fee: \$10.00 for the school year, for college credit.

Class fee: \$2.50 per quarter hour.

Laboratory fees range from \$1.00 to \$5.00 for laboratory and shop classes.

Auditor's Fee, for courses without credit, \$10.00 per class. This does not include shop or laboratory classes.

### Courses

Courses are offered in the Evening School by almost all divisions and departments of the College. This makes available a large number of courses in a wide variety of subjects. Courses can be found to suit the needs and interests of almost anybody in any situation in life.

Many courses offer regular college credit if desired. Others are vocational, special interest, and hobby courses designed to give special training to suit various needs and interests without regard for college credit. These offer terminal credit. Vocational courses are designed to give practical training in various fields of business, trades, industries, agriculture, and home-making.

### CREDIT

College credit may be earned, if desired, in courses designated by numbers, as 1, 12, 62, 81, etc., by meeting the required standards.

Courses designated by letters, as a, b, c, d, e, are vocational or special interest courses that carry vocational or terminal credit instead of regular college credit.

### REGISTRATION

Registration may be started by contacting the Evening School office any time during the week preceding the opening of each quarter, and it may be completed on the first evening of each quarter.

A special Evening School Catalog containing detailed information concerning this program and a description of courses is available at the Evening School office.

## 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. The curriculum also meets requirements for certification in most of the surrounding states.

In past years the majority of summer students have been teachers in secondary and elementary schools. At present an increasing number of regular students 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.

## BRANCH AGRICULTURAL COLLEGE

**Daryl Chase, Director**

Branch Agricultural College of 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. Opportunity for additional training for the youth of Southern Utah was thus opened. Through new college offerings in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education, young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all Branch Agricultural College courses parallel those of the parent institution.

Ten men have served as heads of the Branch Agricultural College 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 Benning 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 the Southern Branch of the 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 Senior Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

In 1948-49 courses for the training of elementary teachers to the Bachelor's Degree were authorized by the Board of Trustees.

The first regular summer school of the College was held in 1949.

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

## SNOW BRANCH COLLEGE

**James A. Nuttall, Director**

Sanpete Stake Academy, founded in 1888 at Ephraim by the Church of Jesus Christ of Latter-day Saints was first a preparatory and intermediate school. High school work was added in 1895. After normal studies were added as a fifth year in 1912, the institution became known as Snow Normal College.

It became a junior college in 1922 and since then has been called Snow College.

It was made a state junior college in 1932, and became a four-year junior college in 1937. The college became a branch of Utah State Agricultural College July 1, 1951. It initiated a Vocational Agriculture Program in 1943.

The College Plant includes: (1) The main campus, on which are the Administration Building, the Science Building, the Mechanics Art Building, Gymnasium, Cafeteria, and outdoor recreational facilities.

(2) The athletic field, an eight-acre tract, contributed by faculty and student body, and equipped for football, track, and other field events.

(3) The college farm, consisting of 60 acres of improved land has ample housing for farm stock, machinery, and storage facilities for feeding supplies and farm crops. A dairy building, a brooder building, and equipment make adequate facilities for training in agriculture. Animals on the farm are registered and are of the highest quality.

(4) The dormitory and housing units, convenient to the campus, provide for both married and unmarried students.

Administrators of the school have been: Alma Greenwood, 1888 to 1891; George C. Christensen, 1891 to 1892; Newton E. Noyes, 1892 to 1921; Wayne B. Hales, 1921 to 1924; Milton H. Knudsen, 1924 to 1933; I. Owen Horsfall, 1933 to 1936; James A. Nuttall, 1936 to the present.

# List of Graduates, 1951

## TWO-YEAR CERTIFICATES

### Agriculture

Del Granado, Jorge

### Air Conditioning and Refrigeration

Packer, Vernon O.

### Automobile Body Reconditioning

Ely, John Thomas

### Automobile Repair

Bailey, Richard Redfern	Hansen, Myron Dale	Palmer, Arlo Kirk
Calloway, Bernell N.	Hunter, David L.	Parry, William Thomas
Clark, Dwain Ray	Mathis, Robert Stoker	Sutton, Stanley W.
Freudenthal, Emil F.	McGuire, Rupert E.	

### Diesel and Heavy Duty Mechanics

Ballif, Richard T.

Bohner, Loren Frank

## BACHELOR OF SCIENCE IN AGRICULTURE

Abdul-Malek, Amin S.	Duffin, Robert Beck
Ahmadi, Ahmad Ali	Eakin, James Ivan
Al Tikrity, A. B.	Esplin, Darlo Lee
Allred, Earl S.	Evans, Kent Tiffany
Anderson, John William	Fonnesbeck, Gordon C.
Anderson, Raymond E.	Foote, Elwood Earl
Atkins, Norman J.	Gammon, David Russell
Balaban, William	Gardner, L. Dee
Barlow, Kingsley H.	Gayvert, Raymond W.
Barnes, Herbert J., Jr.	Godfrey, LaVar
Baxter, Norman DeGraw	Graham, Edmund Fay
Beckstrom, Leland L.	Greif, Philip
Bendixsen, Kay Reed	Hagenbuch, Charles F.
Benson, Kenneth M.	Hampton, James LeRoy, Jr.
Betros, Harry F.	Haney, Edward Lawrence
Bishop, J. Lee	Hansen, Arden M.
Borup, Harry Junior	Harris, Wendell Leon
Boswell, Merlin N.	Haslam, Alden Gunnell
Brewster, Joseph H.	Hawks, Verlyn Eugene
Brobst, James LeRoy, Jr.	Hemmert, Clyde Robert
Bushnell, Melvin J.	Hinton, Delmer
Buttars, Joseph Grant	Hogan, Max R.
Butts, Gilbert Lee	Holbrook, Neil Kohler
Carlson, Roy E.	Hoskin, J. Merlin
Christiansen, Dale	Houghton, Rodney Edward
Chugg, Boyde A.	Howell, Geren V.
Clark, R. Boyd	Howell, Robert B.
Cosgrove, Bartholomew J.	Humphrey, Byron L.
Cramer, Delile F.	Hutchings, Lee Howard
Crawford, Leslie Earl	Jackson, Clarence Wm.
Crump, Kenneth Elmer	Jensen, Lynn Oliver
Cummings, Keith D.	Jones, Charles Robert
Deschamps, David S., Jr.	Jones, Charles W.
Dew, Milo LeRoy	Jones, Don Eugene
Dewey, Douglas R.	Kardos, Ervin Herman
Downs, Leith Rolan	Kinthead, Robert M.

Kreitman, Donald  
 Landagora, Francisco  
 Larson, Lee Wren  
 Little, Neils Clove  
 Loveless, Shirley Ray  
 Makarem, Salim Amin  
 Manderscheid, Clifton D.  
 Marble, Vern L.  
 Maughan, Wesley T.  
 McCarty, Glenn Mason  
 McMurray, Glenn W.  
 Mendes, Frank S.  
 Mickelsen, Charles Henry  
 Miller, LaVell  
 Milligan, Larry Kent  
 Morgan, Dee R.  
 Murray, Glen Edmund  
 Murray, Jay Clarence  
 Neilsen, Grant Ellwood  
 Nelson, Calvin Lawrence  
 Nielsen, Ramon William  
 Nielson, George A., Jr.  
 Olsen, A. Leslie  
 Owens, Blaine Eugene  
 Parrish, James Gilbert  
 Parsons, Edmund H., Jr.  
 Partenheimer, Ronald P.  
 Patterson, John W.  
 Pearson, Jay Fred  
 Platzke, Lloyd Warren  
 Pontius, Robert Vernon  
 Quesenberry, Neil C.  
 Redd, Eugene Ray  
 Redd, Mark H.  
 Reznick, Benito M.  
 Richards, Joel J.

Richman, Bert B.  
 Ritchie, Brent Murdock  
 Robins, Ronald Waldo  
 Rudd, I. Dell  
 Rudd, Oris Clark  
 Sargent, Glen Wilford  
 Savage, Eugene G.  
 Savage, Robert E.  
 Seeley, Clair Mont  
 Shawa, Azmi Yousif  
 Shoemaker, Jack E.  
 Smedley, Calvin D.  
 Smith, Estle D.  
 Smith, R. L.  
 Snow, Frank Bruce  
 Sorensen, Lloyd L.  
 Spackman, Thomas M.  
 Spencer, John C., Jr.  
 Stahley, Ralph F.  
 Stringham, Mark Wimmer  
 Swann, John Richard  
 Taylor, Harold R.  
 Trottnier, Benjamin K.  
 Turner, Dan G.  
 Walker, David R.  
 Walker, John Q.  
 Warburton, Sherman C.  
 White, Lynn T.  
 Wilcox, Clifford L.  
 Wilson, Donald Vaughn  
 Wilson, John J.  
 Wooley, Donald Grant  
 Worley, Sam R.  
 Yassine, Muhamed Younes  
 Yeager, Richard R.  
 Young, Jack F.

## BACHELOR OF SCIENCE IN ARTS AND SCIENCES

Allan, Lamont Dale  
 Allen, Guenavere  
 Arnold, Kenneth Richard  
 Ashman, Roland Bruce  
 Barwick, David Handel  
 Bates, Norris T.  
 Baxter, Robert LaMar  
 Baylis, John Robert, Jr.  
 Blanchard, Robert L.  
 Braegger, Robert Irven  
 Brown, George Merrill  
 Brugger, A. Maynard  
 Buttars, Ruby  
 Call, Robert Israel  
 Call, William Vosco  
 Campbell, Curtis B.  
 Church, Irvan James  
 Copeland, Woodrow W.  
 Cottle, Elwood M.  
 Cottle, Thomas D.  
 Crandall, Peggy  
 Dallimore, Franklyn C.  
 Dalton, Gordon W.  
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- DAVI YANASUGONDHA, Dairy Manufacturing — "A Comparison of Sweet Cream Buttermilk Powder with Non-Fat Dried Milk Solids in the Manufacturing of Ice Cream."
- WILLIAM MERLE ZARBOCK, Wildlife Management — "An Ecological Study of the Utah Sculpin *Cottus Bairdi Semiscaber* in Logan River, Utah."

GORDON LESTER ZORB, Wildlife Management — "Application of Pheasant Census Methods in Cache County, Utah."

DOCTOR OF PHILOSOPHY DEGREE

BAKIR KASHIF ALGHITA, Irrigation and Drainage Engineering — "An Analytical and Experimental Study of the Permeability of Sand."

NAJI ABDUL KADIR, Irrigation and Drainage Engineering — "Measurement of Permeability of Saturated Soils Below the Water Table."

HONORARY DOCTOR OF SCIENCE DEGREE

C. G. Adney

John T. Caine, III

# SUMMARY OF ATTENDANCE 1951

Rank	Agriculture		Arts & Sciences		Commerce		Education		Engineering		Forestry		Home Economics		Total
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
Graduates	60		70	11	25	3	95	16	34		41		1	9	365
Seniors	157		109	36	119	14	102	64	174		63		1	53	892
Juniors	166	1	110	26	113	26	92	86	155	1	70			49	895
Sophomores	181	1	142	49	122	27	75	65	163	2	49		2	68	946
Freshmen	208	3	214	138	89	78	64	71	203	1	49	1		61	1180
Total Collegiate	772	5	645	260	468	148	428	302	729	4	272	1	4	240	4278
Sub-Collegiate			1	1			1	1	3						7
Totals	772	5	646	261	468	148	429	303	732	4	272	1	4	240	4285

Male 3323  
 Female 962  
**Total 4285**

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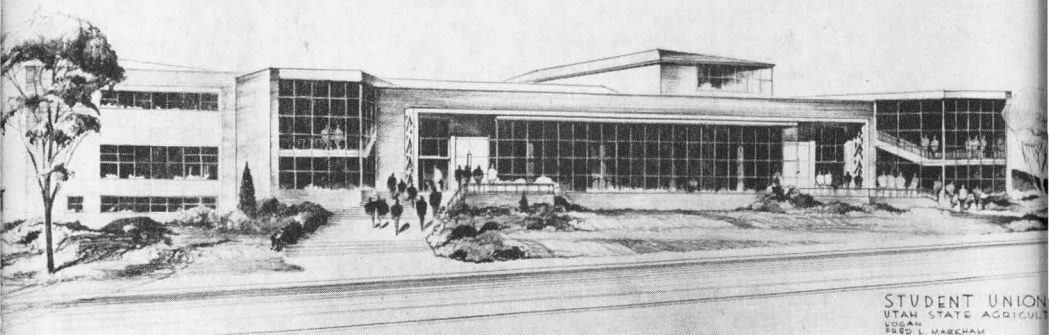
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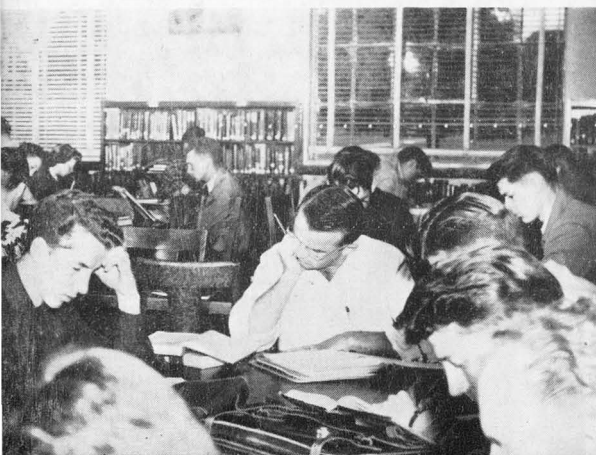
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