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Utah State Agricultural College

LOGAN, UTAH

BULLETIN



CATALOG ISSUE 1948-1949

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UTAH STATE
AGRICULTURAL COLLEGE
BULLETIN



CATALOG ISSUE
1948-1949

Published by the College
1948
LOGAN, UTAH

1948

JANUARY							APRIL							JULY							OCTOBER						
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COLLEGE CALENDAR FOR ACADEMIC YEAR 1948-1949

FALL QUARTER

- September 20, Monday First faculty meeting.
- September 23, Thursday Aptitude and other tests for all new students.
- September 24, Friday Registration of former students.
- September 25, Saturday Registration of all new students.
- September 27, Monday Instruction begins.
- October 25, Monday Prospective graduates submit applications for
candidacy.
- November 24, Wednesday College closes for Thanksgiving Recess.
- November 29, Monday Classes are resumed.
- December 17, Friday Fall Quarter ends.

WINTER QUARTER

- January 3, Monday Registration. Candidates submit applications
for graduation.
- January 4, Tuesday Instruction begins.
- March 16, Wednesday Winter Quarter ends.

SPRING QUARTER

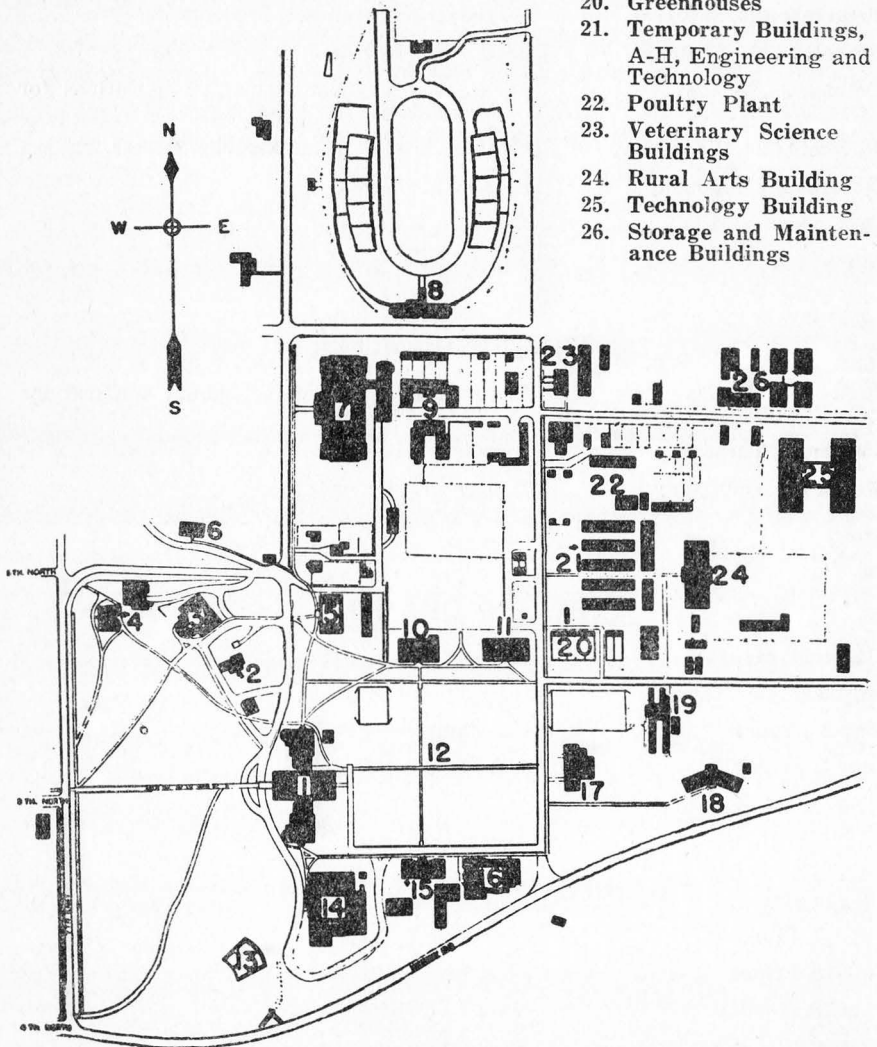
- March 21, Monday Registration.
- March 22, Tuesday Instruction begins.
- May 29, Sunday Baccalaureate Service.
- June 3, Friday 56th Commencement.

SUMMER QUARTER 1949

- June 6, Monday First Session begins.
- July 15, Friday First Session ends.
- July 18, Monday Second Session begins.
- August 19, Friday Second Session ends.

MAP OF CAMPUS

1. Main Building—Administrative Offices of College, Agricultural Experiment Station, Schools of Arts and Sciences, Commerce and Education. Alumni Office. Auditorium. Extension Division. Book Store.
2. President's Residence
3. Smart Gymnasium
4. Forestry Building
Heating Plant
5. Widtsoe Hall—Chemistry, Physics
6. L. D. S. Institute
7. Field House. Connected with it, Military Science Building.
8. Stadium House and Stadium
9. Barns—Dairy, Hog, Sheep, Horse
10. Animal Industry Building
11. Plant Industry Building
12. Quadrangle
13. Amphitheater
14. Mechanic Arts Building
15. Engineering Building
16. Commons Building—Home Economics, Cafeteria; Associated Students Offices.
17. Library
18. Lund Hall, Women's Dormitory.
19. Temporary Union Building
20. Greenhouses
21. Temporary Buildings, A-H, Engineering and Technology
22. Poultry Plant
23. Veterinary Science Buildings
24. Rural Arts Building
25. Technology Building
26. Storage and Maintenance Buildings



ADMINISTRATION

Board of Trustees

Hyrum M. Blackhurst	Salt Lake City
E. H. Street	Richfield
James S. Prestwich	Cedar City
Charles Redd	La Sal
Ray E. Dillman	Roosevelt
Thorpe B. Isaacson	Salt Lake City
W. W. Merrill	Logan
L. C. Montgomery	Heber City
Merrill N. Warnick	Pleasant Grove
A. W. Chambers	Smithfield
D. A. Skeen	Salt Lake City
Ella V. Reeder	Brigham City
Heber Bennion, Jr., Secretary of State (ex officio)	Salt Lake City
W. W. Gardner, President, Alumni Association (ex officio)	Salt Lake City
Russell E. Berntson, Secretary-Treasurer	Logan

Officers of Administration

Franklin S. Harris	President
Carl Frischknecht	Director, Extension Service
R. H. Walker	Director, Agricultural Experiment Station and Dean, School of Agriculture
H. Wayne Driggs	Director, Branch Agricultural College
W. L. Wanlass	Dean, School of Commerce
Ernest A. Jacobsen	Dean, School of Education
Lewis M. Turner	Dean, School of Forest, Range and Wildlife Management
B. L. Richards	Dean, Graduate School
Carlton Culmsee	Dean, School of Arts and Sciences
Ethelyn O. Greaves	Dean, School of Home Economics
Jerald E. Christiansen	Dean, School of Engineering and Technology
Milton R. Merrill	Dean, Summer Quarter
Daryl Chase	Dean of Students
Ione B. Daniel	Dean of Women
King Hendricks	Director of Libraries
Russell E. Berntson	Executive Secretary and Treasurer
Eric A. Johnson	Purchasing Agent and Manager of Bookstore
William H. Bell	Registrar
E. W. Timberlake, Colonel	Commandant, R.O.T.C.
C. Lester Pocock	Chairman, Public Relations
Vera Carlson	Secretary to the President
Sylvan Erickson	Assistant Secretary and Treasurer
Harold M. Wadsworth	Superintendent of Buildings and Grounds

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

Faculty Committees

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

Assemblies—The President, Dean of Students, Professors Fogelberg, N. W. Christiansen, Myers, Student Representatives.

Athletic Council—Professors Hendricks, Alder, Caine, H. B. Hunsaker, Payne, Mr. Berntson, Romney, J. E. Christiansen, Stoddart, Chase, D. A. Skeen, Timberlake, Alumni Secretary, "A" Men's President.

Attendance and Scholarship—Professors Floyd, A. J. Morris, Brite, Giddings, Lyons, West.

- Awards and Honors—Professors Ricks, Geddes, Milligan, W. P. Thomas, Blanch, Kelker, B. Johnson, Bradford.
- Credits and Admissions—Professors H. B. Peterson, Boyle, Hayward, H. C. Sharp, Neuberger, Jones, N. S. Cannon, Registrar.
- Debating—Professors Robinson, Vickers, N. E. Taylor, Hayward.
- Graduate Council—Deans B. L. Richards, Culmsee, E. O. Greaves, Professors Carlisle, Williams, Hendricks, Thorne, Roskelley.
- Graduation—Professors Symons, Mortimer, Kelker, L. E. Harris, Stone, Vermillion, Meyer.
- High School Relations—Mr. Pocock, Professors Jacobsen, Cawley, Noble, Vickers, Chase, Meacham.
- Housing—Mr. Pocock, Van Shaar, Dean of Women, Cotter.
- Library—Academic Deans, Director of Libraries.
- Loan Fund—Mr. Berntson, Chase.
- Lyceum—Professors Fogelberg, N. W. Christiansen, Mr. Berntson.
- Personnel and Guidance—Dean of Students, Dean of Women, Registrar, Professors Maeser, Stone, Jepps, D. W. Thorne, Humpherys, Burns.
- Pre-Medical and Pre-Dental Work—Professors Hammond, Culmsee, Scholes.
- Professional Relations and Faculty Welfare Committee—D. A. Broadbent, L. L. Madsen, Murray, D. W. Thorne, Chase, Floyd, Frischknecht, E. O. Greaves, Symons, W. P. Thomas, Vickers, Williams.
- Publications Council—Professors Culmsee, Vickers, Turner, Reynolds, J. Stewart, Roth.
- Registration—Academic Deans, Registrar Chase, Professors Hayward, H. B. Hunsaker.
- Schedule—Professors W. W. Smith, Kelker, Neuberger, Arrington, Higgins, W. H. Bennett, J. C. Sorenson.
- Social Affairs Committee—Dean of Students, Dean of Women, Professors V. D. Gardner, Heaton, Miss Carlson, Banks.
- Student Organizations—Dean of Students, Dean of Women, Professors Holmgren, Ludlow, Banks, Mr. S. Erickson.
- Teacher Placement—Professors Jacobsen, Humpherys, Carlisle, Cawley.

Emeritus Faculty

- Peterson, Elmer George, B.S., A.M., Ph.D., LL.D. President Emeritus
(Listed in order of seniority of appointment.)
- Peterson, William, B.S., LL. D. Director Emeritus, Extension Service
- Pedersen, N. Alvin, A.B., Ph.D. Dean Emeritus, School of Arts and Sciences
- Greaves, Joseph E., B.S., M.S., Ph.D. Professor Emeritus of Bacteriology
and Biochemistry
- Arnold, Frank Russell, A.B., M.A. Professor Emeritus of Modern Languages
- Frederick, Hyrum John, D.V.M. Professor Emeritus of Veterinary Science
- Newey, Aaron, B.S. Professor Emeritus of Metal Work
- Kyle, Charlotte, A.B., A.M. Professor Emeritus of English
- Jensen, George C., A.B., M.A. Professor Emeritus of Modern Languages
- Daines, Franklin D., A.B., M.A., Ph.D. Professor Emeritus of Political Science
- Peterson, Parley E., A.B., C.P.A. Professor Emeritus of Accounting
- Swenson, D. A., B.S. Professor Emeritus of Woodwork
and Building Construction
- Moen, Johanna, B.S. Professor Emeritus of Textiles and Clothing
- Dancy, Charlotte E., R.N. Professor Emeritus of Physiology
- Peterson, Henry, A.B., A.M., Professor Emeritus of Psychology
- McClellan, Charles E., A.B. M.A. Professor Emeritus of Education
- Brown, Almeda P., B.S., M.A. Professor Emeritus of Home Economics
- Sorensen, Alma Nicholas, A.B., A.M. Professor Emeritus of English
- Evans, R. J., B.S., Ph.D. Professor Emeritus of Agronomy
- Fletcher, Calvin, B.Ped. Professor Emeritus of Art
- Barrows, Effie S., B.S. Professor Emeritus, Extension Home
Furnishings Specialist

Faculty

(Including College, Agricultural Experiment Station, Extension Service,
and Branch Agricultural College)

- Harris, Franklin S., B.S., Ph.D., LL.D.,
President
- Alder, Byron, B.S.,
Professor of Poultry Husbandry
- Allen, Bert V.,
Instructor in Photography
Photographic Service
- Andersen, E. Milton, B.S., M.S., Ph.D.,
Associate Professor of Vegetable Crops
- Anderson, Wendell, B.S.
Instructor in Political Science
- Andersen, Stanley, B.S.,
Instructor in English and Journalism
- Anderson, Roice H.,
Associate Professor of Agricultural Economics and Marketing
- Arrington, L. J., B.A.,
Assistant Professor of Economics
- Bailey, Reed W., B.S., M.S.,
Director, Intermountain Forest and Range Experiment Station
Non-resident Professor of Forestry
- Bates, George S., B.S., M.A.,
Collaborator in Teacher Training
- Bee, Lawrence S., B.A., M.S., Ph.D.,
Associate Professor of Sociology
- Beecher, Asa L.,
Assistant in On-the-Job Training
- Bell, Marvin T., B.S.,
Instructor in Physical Education
Assistant Coach
- Bell, William H., B.S., M.S.,
Registrar, Associate Professor
- Bennett, James A., B.S., M.S.,
Assistant Professor of Animal Husbandry
- Bennett, William H., B.S.,
Assistant Professor of Agronomy
- Berntson, Russell E.,
Executive Secretary and Treasurer
- Biddulph, Clyde, M.S., M.Ph., Ph.D.,
Associate Professor of Physiology
- Binns, Wayne, B.S., D.V.M.,
Associate Professor of Veterinary Science
- Bishop, A. Alvin, B.S., M.S.,
Associate Professor of Irrigation and Drainage
- Blanch, George T., B.S., M.S., Ph.D.,
Professor of Agricultural Economics and Marketing
- Blaser, Glenn F., B.S.,
Veterans' Coordinator
- Bowen, Calvin M., B.S., M. S.,
Associate Professor of Forestry
- Bowen, Edith, B.S., M.S.,
Assistant Professor of Education

- Boyle, William S., B.A., Ph.D.,
Associate Professor of Botany
- *Bracken, Aaron F., B.S., M.S.,
Professor of Agronomy
- Bradford, James C., Lt. Col., QMC,
Assistant Professor of Military Science and Tactics
- Brimmer, Marvin L., 1st Sgt., DEML,
Instructor in Military Science and Tactics
- Brite, J. Duncan, B.A., A.M., Ph.D.,
Professor of History
- Broadbent, Marden, B.S.,
Assistant Professor of Animal Husbandry
- Broadbent, Dee A., B.S., M.S.,
Associate Professor of Agricultural Economics and Marketing
- Budge, Pearl S., B.S.,
Instructor in English
- Bullen, Asa, B.S., LL.B.,
Lecturer in Commercial Law
- Buntine, Hugh A., B.E.E.,
Assistant Professor of Aeronautics
- Burns, Ann, R. N.,
College Nurse
- Burton, Theodore M., A.B., M.A.,
Associate Professor of Chemistry
- Bush, Richard A., B.S.,
Instructor in Botany
- Caine, George B., B.S., M.A.,
Professor of Dairy Industry
Extension Dairyman
- *Calvert, Ralph L., B.A., M.A.,
Associate Professor of Mathematics
- Cannon, Melvin C., B.S., M.S., Ph.D.,
Associate Professor of Chemistry
- Cannon, Norman S., B.S., M.S.,
Assistant Professor of Accounting and Business Administration
- Carlisle, John C., B.S., M.S., Ed.D.,
Professor of Education
- Carlson, Oretta M., B.S.,
Instructor in Home Economics
- Carlson, Vera,
Secretary to the President
- Carter, Don, B.S., M.S.W.,
Assistant Professor of Sociology
Assistant Director, Division of Social Work
- Cawley, Helen L., A.B., B.S., M.S.,
Assistant Professor of Home Economics Education
- Chase, Daryl, B.A., M.A., Ph.D.,
Professor and Dean of Students
Director, Student Personnel
- Carter, Pearl J., B.S.,
Assistant Librarian
- Christiansen, Jerald E., B.S., M.S., C.E.,
Professor of Civil Engineering
Dean, School of Engineering and Technology
Director, Engineering Experiment Station
- Christiansen, N. Woodruff, B.S., M.A., Ph.D.,
Professor of Instrumental Music

- Clark, Clayton, B.S., E.E.,
Associate Professor of Radio
- Cole, Larry S., B.S., M.S.,
Associate Professor of Radio and Physics
- Cook, C. Wayne, B.S., M.S.,
Assistant Professor of Range Management
- Cornaby, Floyd V., B.S., M.A.,
Professor of Art
- Cotter, Harold E., Lt. Col., AC,
Assistant Professor of Military Science and Tactics
- Coulam, Joseph, B.S.,
Associate Professor of Woodwork and Building Construction
- Crandall, Bliss H., B.S., M.S.,
Professor and Director, Statistical Laboratory
- Culmsee, Carlton, B.S., M.A., Ph.D.,
Professor of Journalism
Dean, School of Arts and Sciences
- Daines, Spencer H., B.S.,
Assistant Professor of Agricultural Engineering
- Daniel, Ione B., B.A.,
Dean of Women, Associate Professor
Supervisor, Women's Residence Halls
- Daniel, T. W., B.S., M.S., Ph.D.,
Professor of Forestry
- Dean, Elva C., B.A., M.A.,
Instructor and Associate Librarian
- Doty, Ina, B.S., M.S.,
Assistant Professor of Business Administration and Accounting
- Draper, Carroll I., B.S., M.S., Ph.D.,
Associate Professor of Poultry Husbandry
- Driggs, H. Wayne, B.A., M.A., Ph.D.,
Director, Branch Agricultural College
- Dutton, Elizabeth Anne, B.S., M.Ed.,
Associate Professor of Physical Education
- Edgecombe, Samuel W., B.S.A., M.S.C., Ph.D.,
Professor of Horticulture
- *Elich, Joe, B.S., M.A.,
Instructor in Mathematics
- Erickson, Sylvan, B.S.,
Assistant Secretary and Treasurer
- Embry, Bertis L., B.S.,
Assistant Professor of Agricultural Engineering
- Farrer, Helen M., B.A., M.A.,
Instructor in Speech
- Floyd, J. Whitney, B.S., M.S.,
Professor of Forestry
- Fogelberg, Thelma, B.S., M.A., Ph.D.,
Associate Professor of Modern Languages
- France, Edward Leroy, B.S.,
Assistant Professor of Automotive Mechanics
- Francisco, J. L., B.S.,
Instructor in Mathematics
- Frandsen, Arden, B.S., M.S., Ph.D.,
Professor of Psychology
- Frederickson, Carmen, B.S., M.S.,
Instructor in Sociology

*On leave.

- Frischknecht, Carl, B.S., M.S., Ph.D.,
Professor of Poultry Husbandry
Director of Extension Service
- Gardner, V. D., B.S., M.B.A.,
Professor of Accounting and Business Administration
- Gardner, Willard, B.S., M.S., Ph.D.,
Professor of Physics
- Geddes, Joseph A., A.B., A.M., Ph.D.,
Professor of Sociology
Director, Division of Social Work
- Gerber, Robert K., B.S., M.S.,
Assistant Professor of Horticulture
- Gilmore, Florence L., B.S., M.S.,
Assistant Professor of Textiles and Clothing
- Greaves, Ethelyn O., B.S., M.S., Ph.D.,
Professor of Foods and Dietetics
Dean, School of Home Economics
- Greenwood, Delbert A., B.S., M.S., Ph.D.,
Professor of Biochemistry
- Gunnell, Merrill H., B.S.,
Instructor in Zoology
- Gustafson, Lela Blanche Brown, B.S., M.S.,
Instructor in Foods and Dietetics
- Gunderson, Howard B., B.S., M.A.,
Non-resident Professor of Trade and Industrial Education
- Hammond, Datus M., B.S., M.A., Ph.D.,
Professor of Zoology
- Hansen, Harold I., B.S., M.A.,
Assistant Professor of Speech
- Hardman, Stuart, B.S.,
Instructor in Speech
- Harris, Lorin E., B.S., M.S., Ph.D.,
Associate Professor of Animal Husbandry
- Hart, Philip J., B.S., Ph.D.,
Associate Professor of Physics
- Hatch, LaPreal S.,
Assistant Librarian
- Hayward, Ira N., B.S., Ph.M.,
Associate Professor of English
- Hawkes, Glenn, B.S.,
Vocational Adviser
- Heaton, Israel C., B.S., M.S.,
Assistant Professor of Physical Education
- *Heed, Willard M., A.B.,
Instructor in English
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Assistant Professor, Assistant Boys' and Girls' Club Specialist
-
- Assistant Professor, Extension Clothing Specialist*
- Stewart, John J.,**
Assistant Professor, Extension Editor
- Taylor, Morris H., B.S., M.S.,**
Assistant Professor, Extension Cattle Marketing Specialist
- Thomas, W. Preston, B.S., M.S., Ph.D.,**
Professor, Extension Economist
-
- Assistant Professor, Consumer Education*
- Burton, Alma P., B.S.,**
Secretary to Director

COUNTY AGRICULTURAL AGENTS

- Acord, Clair Reid, B.S.,**
Instructor, Assistant County Extension Agent, Millard County
- Bagley, LaZone, B.S., M.S.,**
Assistant Professor, County Extension Agent, Wayne County
- Barron, Howard H., B.S.,**
Instructor, Assistant County Extension Agent, Weber County
- Barlow, Joel C., B.S.,**
Instructor, Assistant County Extension Agent, Utah County
- Biggs, Ernest O., B.S.,**
Assistant Professor, County Extension Agent, San Juan County
- Boswell, S. R., B.S.,**
Professor, County Extension Agent, Utah County
- Burningham, Melvin S., B.S.,**
Instructor, Assistant County Extension Agent, Salt Lake County
- Burtenshaw, G. Ray, B.S.,**
Assistant Professor, County Extension Agent, Piute County
- Call, Anson B., Jr., B.S., M.S.,**
Associate Professor, County Extension Agent, Washington County
- Christiansen, A. L., B.S., M.S.,**
Professor, County Extension Agent, Weber County
- Davis, Lawrence C., B.S.,**
Assistant Professor, County Extension Agent, Grand County
- Esplin, Grant M., B.S.,**
Assistant Professor, County Extension Agent, Beaver County
- Frederick, Harold H., B.S., M.S.,**
Assistant Professor, County Extension Agent, Rich County
- Guymon, E. Lee, B.S., M.S.,**
Associate Professor, County Extension Agent, Summit County

- Hansen, Reuben, B.S.,**
Instructor, Assistant County Extension Agent, Cache County
- Hassel, Robert L., B.S.,**
Assistant Professor, County Extension Agent, Carbon County
- Hunsaker, Lloyd R., B.S., M.S.,**
Associate Professor, County Extension Agent, Cache County
- Jensen, Louis A., B.S.,**
Assistant Professor, County Extension Agent, Duchesne County
- Keetch, Russell R., B.S.,**
Associate Professor, County Extension Agent, Sanpete County
- Martineau, Vere L., B.S.,**
Professor, County Extension Agent, Salt Lake County
- Moore, James Reed, B.S.,**
Assistant Professor, County Extension Agent, Kane County
- Nichols, DeLore, B.S.,**
Professor, County Extension Agent, Davis County
- Parrish, Joseph F., B.S.,**
Assistant Professor, County Extension Agent, Juab County
- Peterson, Melvin M., B.S., M.S.,**
Instructor, Assistant County Extension Agent, Davis County
- Price, Lew Mar, B.S.,**
Professor, County Extension Agent, Sevier County
- Rickenbach, Rodney G., B.S.,**
Assistant Professor, County Extension Agent, Millard County
- Shumway, R. Phil, B.S.,**
Instructor, Assistant County Extension Agent, Utah County
- Smith, Albert E., B.S.,**
Professor, County Extension Agent, Tooele County
- Stewart, Robert H., B.S.,**
Professor, County Extension Agent, Box Elder County
- Stokes, L. Darrell, B.S.,**
Assistant Professor, County Extension Agent, Emery County
- Thatcher, Ray A., B.S.,**
Assistant Professor, County Extension Agent, Garfield County
- Tueller, Lamont E., B.S.,**
Associate Professor, County Extension Agent, Iron County
- Whitaker, William C., B.S.,**
Assistant Professor, County Extension Agent, Uintah County
- Willie, Vernal, B.S.,**
Instructor, Assistant County Extension Agent, Box Elder County
- Willis, Curtis L., B.S.,**
Assistant Professor, County Extension Agent, Morgan County

HOME DEMONSTRATION AGENTS

- Agren, Ellen, B.S., M.A.,**
Associate Professor, Home Demonstration Agent, Davis County
- Bacon, Mary R., B.S.,**
*Assistant Professor, Home Demonstration Agent,
Wasatch County*
- Boyer, Leah, B.S.,**
Assistant Professor, Home Demonstration Agent, Juab County
-
- Assistant Professor, Home Demonstration Agent, Sevier County*
- Coates, Ruth D., B.S.,**
Assistant Professor, Home Demonstration Agent, Piute County
-
- Assistant Professor, Home Demonstration Agent, Kane County*
-
- Assistant Professor, Home Demonstration Agent, Beaver County*

UTAH STATE AGRICULTURAL COLLEGE

- Foy, Elizabeth F., B.S.,
*Assistant Professor, Home Demonstration Agent,
Garfield County*
- Hansen, Bessie, B.S.,
*Assistant Professor, Home Demonstration Agent,
Box Elder County*
- Humphreys, Merene R., B.S.,
Assistant Professor, Home Demonstration Agent, Emery County
- Johnson, Theta, B.S.,
Assistant Professor, Home Demonstration Agent, Carbon County
- Kearsley, Amy R., B.S., M.S.,
Assistant Professor, Home Demonstration Agent, Cache County
- Linford, Bernice S., B.S.,
Assistant Professor, Home Demonstration Agent, Iron County
- Lund, Ethel B., B.S.,
*Assistant Professor, Home Demonstration Agent,
Salt Lake County*
- Magleby, Jean, B.S.,
*Assistant Professor, Home Demonstration Agent,
San Juan County*
- Martin, Maude, B.S.,
Assistant Professor, Home Demonstration Agent, Weber County
- Meeks, Margaret, B.S.,
*Assistant Professor, Home Demonstration Agent,
Morgan County*
- Moore, Elva Luella, B.S.,
*Assistant Professor, Home Demonstration Agent,
Summit County*
- Nielsen, Sarah S., B.S.,
Assistant Professor, Home Demonstration Agent, Millard County
- Palfreyman, Bernice, B.S.,
Assistant Professor, Home Demonstration Agent, Sanpete County
- Poulsen, Jenniev J., B.S.,
Instructor, Assistant Home Demonstration Agent, Utah County
- Smith, Eleanor S., B.S.,
*Assistant Professor, Home Demonstration Agent,
Washington County*
- Smith, Ruby K., B.S.,
Assistant Professor, Home Demonstration Agent, Uintah County
- Stevens, Velyn B., B.S.,
Assistant Professor, Home Demonstration Agent, Utah County
- Stone, Betty Jeanne, B.S.,
Assistant Professor, Home Demonstration Agent, Tooele County
- Wamsley, Helen J., B.S.,
Assistant Professor, Home Demonstration Agent, Rich County

BRANCH AGRICULTURAL COLLEGE

Officers of Administration

- Driggs, H. Wayne, B.A., M.A., Ph.D.,
Director, Branch Agricultural College
- Cooley, Hazen, B.S., M.B.A.,
Assistant Secretary and Treasurer
- Oldroyd, Elva, B.S.,
Registrar
- Robb, Ward S.,
Office Assistant

Faculty

- Ashcroft, Theron, B.S.,**
Associate Professor of Physics and Engineering
Chairman, Division of Engineering and Mathematics
- Bastow, Mary Lovina, B.S.,**
Associate Professor of Arts and Textiles
- Bell, T. Donald, B.S., M.S., Ph.D.,**
Professor of Animal Husbandry
Chairman, Division of Agriculture
- Cooley, Charles B., B.S., M.Ed.,**
Associate Professor of Industrial and Vocational Education
Chairman, Division of Industrial and Vocational Education
- Cooley, Hazen, B.S., M.A.,**
Associate Professor of Business
- Dalley, Parley, B.S., M.S.,**
Professor of Physical Sciences
- Davis, Victor,**
Instructor in Auto Mechanics
- Driggs, H. Wayne, B.A., M.A., Ph.D.,**
Professor of English and Education
- Halverson, Roy L., B.S.,**
Associate Professor of Music
- Hanson, Wallace R., B.S., M.S.,**
Assistant Professor of Range Management
- Hanson, Wallace R., B.S., M.S.,**
Assistant Professor of Range Management
- Hardy, Eugene,**
Assistant Professor of Auto Mechanics
- Kimball, Fern M., B.S.,**
Instructor in Home Economics and Institutional Management
- Kupfer, Fern M., B.S.,**
Instructor in Psychology and Social Science
- LeBaron, George L., B.S.,**
Instructor in Physics and Radio
- Lindquist, Ray, B.S.,**
Instructor in Physical Education
Director of Physical Education
Athletic Coach
- Manning, Wm. H., A.B.,**
Associate Professor of Voice and Theory
Chairman, Division of Music
- Maughan, Murray, B.S.,**
Instructor in Physical Education
Athletic Coach
- Nelson, Donald K., B.S., B.L.S.,**
Assistant Professor of English
Librarian
- Olsen, Floris S., B.S.,**
Instructor in Secretarial Science
- Peterson, Edwin L., B.S., M.A.,**
Assistant Professor of Social Science
Chairman, Division of Social Sciences
- Plummer, H. J., B.A., M.A.,**
Assistant Professor of English
Veterans' Coordinator
Dean of Students
- Rowley, Richard M., B.S.,**
Instructor in English

Sargent, David L., B.S., M.S.,
Associate Professor of Agriculture and Biology
Chairman, Division of Biological Sciences

Schmutz, Clarence, B.A., M.A.,
Assistant Professor of Agricultural Economics

Stephensen, A.W., B.S.,
Assistant Professor of Commerce
Chairman, Division of Commerce

Swindle, Karma P., B.S.,
Assistant Professor of Home Economics
Dean of Women

Tippetts, Twain, B.A., M.A.,
Assistant Professor of English
Chairman, Division of English

Wahlquist, A. Glenn, B.S.,
Instructor in Agriculture and Biology

Instructor in Mathematics and Chemistry

Instructor in Physical Education

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General Information

LOCATION

UTAH State Agricultural College is in Logan, Cache County. The city is a typical college town of 14,000 inhabitants. Highways 89 and 91 intersect at Logan, and the town is served by the Burlington Trailways bus line, the Greyhound bus line, and the Union Pacific Railroad for freight service. The College is located one mile east of the business section of Logan on a hill overlooking the valley.

POLICY

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

Although the College remains alert to satisfy emergency needs of state and nation, it continues a full educational offering in the seven schools of instruction. To do less than this would be to weaken the very foundations upon which democracy rests, for now more than ever before the country needs men and women trained for efficient leadership in every branch of human endeavor. Accordingly, the traditional policy of the College will be maintained, which, in accordance with the spirit of the law under which it was organized, is to provide a liberal, thorough, and practical education. The two extremes in education, empiricism and the purely theoretical, are avoided; for the practical is based upon and united with the thoroughly scientific. In addition to the practical work of the different courses, students are given excellent training in the sciences, mathematics, history, English, art, music, speech, modern languages, and other related subjects. The object is to foster all that makes for right living, good citizenship, high efficiency, and general culture.

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

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

HISTORY

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

The purposes of the college have been stated in Federal and Territorial acts. The Federal Land Grant Act of 1862 explained that the colleges were, "without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several 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." Though the fields of education increased in number and scope and additional subjects were added to the curriculum in harmony with subsequent legislative acts, each president of the college has reaffirmed the purposes as set forth by the Federal and Territorial founders of the school.

The necessary legislation having been enacted to set up the machinery, the next important task was to establish the college concretely. The Lund Act declared the school should be erected "at any place in Cache county that may be designated by the trustees." Logan and Cache county gave the present site of one hundred acres and in 1889, the contract for the south wing of the main building was let to the contractors. Professor J. W. Sanborn of New Hampshire was chosen as director of the Experiment Station, and in 1890, he came to Utah, arriving in Logan in January. The wing of the building was completed, members were chosen for the experiment station and the college staff, and in September 1890, the college opened its doors to prospective students. President Sanborn, Professors W. P. Cutter, E. S. Richman, John T. Caine, Jr., Abby Marlatt, A. A. Mills, Jacob Sholl, H. C. Everett, and Sarah Goodwin formed the first faculty. The student body of 1890-1891 totaled 139, many of them being below the college rank of those days.

Since its beginning in 1890, seven presidents have guided the destinies of the college. Following President Sanborn came President J. H. Paul in 1894, President J. M. Tanner in 1896, President W. J. Kerr in 1900, President John A. Widsøe in 1907, and President E. G. Peterson in 1916. Dr. Franklin S. Harris, in taking over in 1945, became the seventh president of the institution. From one building in 1890, the number of buildings has reached thirty-eight, plus many temporary buildings of various sizes. The college faculty has grown from 9 in 1890 to nearly 400 in 1948, and the student body has expanded from 139 in the beginning to a cumulative total of the regular school year of 4600 regularly enrolled students in 1947-48. In addition, there were several hundred students in "related instruction" courses.

Seven schools: Agriculture, Arts and Sciences, Commerce, Education, Engineering and Technology, Forest, Range, and Wildlife Management, and Home

Economics, provide professional and cultural training. The institution is on the accepted list of the Association of American Universities and the American Association of University Women. In 1929 the name of the college was changed from Utah Agricultural College to Utah State Agricultural College.

PHYSICAL PLANT

The physical plant of the College has been built over a period of half a century, and comprises one of the most beautiful college campuses in the whole country. It occupies more than ninety acres of the large delta built up of gravels and sediments brought down from the Wasatch Mountains to the east by Logan River into ancient Lake Bonneville over thousands of years. Many of the structures and landscape features of the campus still suggest something of the doings of nature in that remote past. Alterations and carvings of the old lake delta into beautiful terraces, curves and elevations, during the times of its ups and downs and since the last recession of the ancient lake to its present Salt Lake remnant, are still outstanding features. Viewed from College Hill in any direction, north, south, east or west, the mountains, the valley, the green fields, meandering streams, and the distant horizons with their angular profiles against clear blue skies, all provide pleasure and inspiration.

Buildings and Facilities

To house its many varied and rapidly growing educational and research activities, the College now has 38 carefully planned, mostly modern, steam-heated and well lighted buildings on the campus. Identified with each building or group of buildings are to be found centers of student activities and interests which largely go to make up the undergraduate life at the College.

The Main Building, so called, a three-story brick structure 350 feet long, is the landmark in the history of the institution. This building, whose halls and classrooms have resounded to the voices of the classes coming and going since the College was founded nearly 60 years ago, is the hub about which most activities revolve. 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 located in the east wing of the building. A Little Theatre, used by the Speech department, is on the second floor, west wing. The offices of the Dean of Students, Dean of Women, and the officials who supervise the war veteran enrollees are on the first floor, north wing.

A combination Home Economics and Commons Building, perhaps the most imposing and carefully planned building on the campus for its multiple purposes, is the social and cultural center of the College. It is used exclusively for College functions, the students and faculty alike taking advantage of the facilities offered in the way of lounges, reception and ball rooms. The building also houses a cafeteria with well-equipped kitchens and dining rooms for the comfort and convenience of students and faculty. Educationally, this structure functions on the campus as the housing quarters of the School of Home Economics and classes in Physiology. These departments are provided with ample space in modern, well-lighted classrooms and laboratories. All research and practice laboratories are provided with standard, scientific equipment. Student Body offices are also in this building.

The Thomas Smart Gymnasium, erected in 1912, is still 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. Besides being the center of College competitive athletics, the building is used for other large college and public gatherings. Especially, since the size of the student body became a problem, has the Field House demonstrated its multiple purpose usefulness by providing adequate space for commencement exercises. 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. Also it is used for certain military activities, student body dances, and other large functions.

A companion building to the Field House, completed in 1940, is the Military Science Building, located just to the east with a corridor connection between the two. This brick-concrete structure, 50 feet by 180 feet, is provided with excellent offices, classrooms, rifle ranges, gun and equipment supply rooms. A large gun shed is part of the building. Because of its association with the Field House, military training the year 'round is greatly facilitated.

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

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

The Animal Industry Building, a three-story, brick-concrete structure erected in 1917, is occupied by the department of Dairy Industry, Animal Husbandry, Poultry, Vegetable Crops, and Horticulture. The building is well equipped with laboratory and classroom facilities for the study and teaching of dairy manufacturing and animal husbandry, including dairy and beef cattle, horses, hogs, sheep and poultry. A modern, fully equipped cheese and butter manufacturing plant occupies part of the building, which is used for practical training in dairy products manufacturing. Complete laboratories for research and studies in animal nutrition and wool grading are in this building. Classrooms and office space for the departments of Vegetable Crops and Horticulture are provided until such time as other and more suitable quarters can be provided for the work in these fields.

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

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

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

The Library Building constructed in 1930, academic and cultural center of the College, is located on the east side of the quadrangle. Space is provided

for a Children's Library in connection with a beautifully designed special reading room for under-college age groups. The departments of English and History use the top floor for their classes because of convenient access to library stacks.

The Forestry Building, located on the northwest corner of the campus, is another of the older buildings. A four-story, brick structure, in the olden days it was originally a girls' dormitory, and later the home of the School of Home Economics. Rearranged when the Commons and Home Economics Building was completed, it houses the School of Forestry. Thorough and technical training in the departments of Forest, Range and Wildlife Management is provided. Its classrooms, laboratories and specimen museums are provided with equipment and all facilities for complete training in these important fields of national resources. In connection with the Forestry School, the College conducts a Forestry Summer School at its own camp, located in Logan Canyon about 20 miles northeast from the College.

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

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

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

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

College greenhouses comprise seven complete units which cover 11,588 square feet of planting space. Head houses in connection furnish room for laboratory, storage, and sorting space needed for student training and research in plant breeding and propagation in horticulture, floriculture, vegetables, grains and grasses. In 1939, two new greenhouses were added, greatly relieving the crowded condition in the old houses. The houses are used largely for experimental work in plant breeding research, insect and disease control.

The College barns are suitable for the care of cattle, horse, sheep and hogs with ample storage space for livestock feeds. In the College-owned herds are individuals and groups representative of various breeds of livestock common to the intermountain section. An experimental demonstration Holstein dairy herd is maintained and operated by the College and Experimental Station on a modern dairy farm located at North Logan, one mile north of the campus. In 1939, more pure bred dairy and beef cattle were added to the herds. Most of these additions are located on farm property acquired from Cache County, both of which add greatly to the facilities of the College for training students in livestock feeding and breeding technique.

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

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

The Veterinary Science Building, a one-story brick-concrete structure, has office space, a well equipped dispensary, operating rooms, stalls for animals, and modern equipment for training and scientific work in Veterinary Science and Medicine. A veterinary clinic is periodically conducted. The building is equipped for research and clinical work in Veterinary Science and animal diseases.

Construction of an extensive Technology Building with shops and facilities for Aeronautics, Automotive and other technical training was approved in 1948.

The main College heating plant is located in a central boiler house. Heat is supplied to the buildings by means of steam through distribution lines in tunnels. To provide adequate heat for the greatly increased campus require-

ments of the last few years, the plant has been much enlarged and put on a high pressure steam operating basis. The plant now has a capacity of approximately 1000 horsepower. The latest addition to the plant was a 290 horsepower water tube boiler, capable of operating at 100 percent overload.

Laboratories

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

College Library

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

All of the material in all of the branch libraries is recorded in the master catalogue and indexes of the main Library, making all material accessible to research workers on the campus. Utah State is a depository for the Superintendent of Documents. All documents coming from the Federal Government are classified, cataloged, shelved, and made available to the public. At the present time, the College receives 1,050 documents by regular subscription and many more each month by special requests. The libraries receive by subscription and gift approximately 1,300 current journals and newspapers. The book collection numbers 125,000 representing practically every field of learning.

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

Herbarium

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

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

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

Graduate work in plant taxonomy offered by the Department of Botany utilizes the adequate facilities of the herbarium. These graduate studies may entail thesis researches of a phyto-graphic, revisionary, or floristic nature.

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

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

STUDENT ORGANIZATIONS

Government and Traditions of the Student Body Organization

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

1. a. Athletics for men. b. Athletics for women.

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

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

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

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

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

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

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

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

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

Organizations

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

Foreign Students

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

In 1948 the following countries were represented at USAC: Belgium, Burma, Canada, Chile, China, Columbia, Egypt, France, Honduras, Island, India, Iran, Iraq, Lebanon, Mexico, Palestine, Peru, Puerto Rico Syria and Trans-Jordan.

Assemblies

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

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

U. S. A. C. ALUMNI ASSOCIATION

W. W. GARDNER, *President*

D. A. SKEEN, *Past President*

LEONARD W. McDONALD, *Executive Secretary and Treasurer,
Director, Division of College Development and Alumni Relations.*

The Utah State Agricultural College Alumni Association was organized on June 13 and 14, 1899, by Alumni who met on the campus and formed the Association. At that time there were 44 members. The Association has shown consistent and rapid growth until it numbers more than 7,500 graduates and approximately 40,000 former students who did not obtain degrees.

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

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

Membership. Any person who has attended Utah State Agricultural College one quarter or more may obtain membership in the Alumni Association by making application to the Alumni Executive Committee. All persons receiving degrees, diplomas or terminal vocational certificates from the College automatically become members. Sustaining membership in the Associa-

tion may be had by parents of graduates or students or by others who have shown an interest in the College or the Association, upon the payment of annual dues of five dollars. Persons not eligible for regular membership in the Association, but who have done some outstanding service to the Institution are eligible for honorary membership, and may become honorary members upon recommendation of the Executive Committee, and upon being accepted by the Alumni Council.

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

Government. The governing power of the Association is vested in the Alumni Council composed of fifteen elected members, and ex officio members. From this group, a president and four executive members are chosen. The president and the executive committee select the Executive Secretary and Treasurer of the Association when that position is declared vacant. The Alumni Executive 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 which each year sponsors dinner meetings and parties for alumni and former Aggie students in their respective areas.

Since September, 1925, the Alumni Association has published the Utah State Alumni Quarterly, a magazine appearing four times each year and devoted to keeping Alumni members informed of each other's doings, and to maintaining a strong relationship between the Alumni and College.

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

"A" MEN'S ATHLETIC ASSOCIATION

CANTRIL NIELSEN, *President*
HERMAN NELSON, *Secretary-Treasurer*

The purpose of this organization is to foster a sound and healthy spirit of cooperation between the former letter-winning athletes of Utah State Agricultural College and the College, and to promote the spirit of good fellowship among the former letter-winning athletes to the end that athletics at Utah State shall be conducted on a high plane, ethically and otherwise.

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

PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE

The Professional Relations and Faculty Welfare committee has been authorized by the Board of Trustees and the Administration and elected by the Faculty to represent the Faculty on matters pertaining to professional relationships and welfare. A principal duty of the Committee is to cooperate with Faculty professional relations and welfare, leading to better understanding the Administration in the development of standards, policies, and programs on and improving the relationships among the Faculty, Administration, students and other groups.

ACADEMIC REGULATIONS

For purposes of administration, the College is divided into the following major divisions: (1) the Academic, which is administered through seven schools; (2) the Research, administered through two Experiment Stations; (3) the Extension Service; (4) the Summer Session; (5) the Correspondence and Extension Class Work; and (6) the Branch Agricultural College at Cedar City. The academic regulations apply to all instructional work of regular session, summer session, correspondence and extension study.

Admission

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Acceleration toward the degree may be obtained by submitting records of formal and informal educational development somewhat equivalent to that which might have been expected from college study and by taking tests of such development. Credit will be given for training received in military service when such training meets the standards of the Institution and is equivalent to courses offered in the Institution. Review and short refresher courses will also be given when found needed.

Registration and Credits

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

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

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

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

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

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

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

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

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

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

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

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

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

F grades will be recorded in case of failure to obtain passing grades in any of the courses for which the student has registered, regardless of the reason for the failure. Changes are considered official only when signed and approved by the instructors of the classes and the dean.

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. This privilege does not contemplate the combination of "visiting" or "auditing" a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure informal educational experience that is the possible equivalent of an organized course given in the College.

A maximum of 36 credits can be acquired by examination. None of the last 30 credits presented for a B.S. degree may be obtained in this manner. The credits may be obtained by special subject examination (maximum of 18 hours) or by the General Education Development Tests—college level—(maximum of 36 credits). In no case can a total of more than 36 credits be permitted for college credit. Unless the examination is taken prior to the close of the second week of any quarter for which a student enrolls, the credit gained is included as part of the student's load for the quarter. The Dean and major professor are responsible to see that no duplication of credit is allowed.

Petition should be made to the Committee on Special Examination on special forms to be obtained at the Registrar's Office.

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

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

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

Students in the low scholarship group are on probation for poor scholarship.

Students on probation who violate the terms of their probation are subject to immediate suspension from the college.

When in doubt regarding any of the regulations affecting them, students on probation should consult with the Attendance and Scholarship Committee. This Committee, alone, has the authority to waive or modify the terms of probation.

Students in the low scholarship group may not register for more than 15 credits per quarter, exclusive of one hour of Physical Education or Military Science.

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

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

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

LOWER DIVISION

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

Provisions are made in several departments of the College for the issuance of Certificates of Completion for two years of work as prescribed by such departments.

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

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

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

A. English Composition.

1. A special placement examination in English is required of all freshmen.
2. Freshman students in the School of Engineering and Technology and in the School of Forest, Range, and Wildlife Management are required to complete English 17, 18, and 19.
3. All other students are required to complete English 10 or 11 in the sophomore year.

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

GROUP REQUIREMENTS

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

1. **Biological Science.** This group requirement may be satisfied by taking any one of the following combinations of courses:
 - A. Botany 1 or Zoology 1, and any lower division Bacteriology course, or Physiology 4.
 - B. When more technical courses are required they may be used to satisfy this group requirement if taken in any of the following sequences:
 1. Botany 24, 25.
 2. Zoology 3, 4.
 3. Zoology 2 and Botany 25, or any lower division of Bacteriology course.

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

2. **Exact Science.**

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

3. **Language and Arts.**

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

4. **Social Science.**

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

Majors in departments in the School of Arts and Sciences should see the introduction to the Arts and Sciences section of this catalog for suggested courses with which to fill group requirements.

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

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

UPPER DIVISION

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

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

Major Subject: The student should select a major subject upon entering, or early the first year, but in no case later than entrance in the Upper Division. As soon as the major subject has been selected, the student should contact the head of the department in which he has decided to major. The head of the department will thereafter act as the student's adviser. The student's registration in each succeeding quarter should be carefully checked and approved by this adviser (called the major professor) in order to insure proper selection and sequence of courses for satisfying institutional and departmental requirements.

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

Special consideration is granted students who pursue prescribed Pre-medical, Pre-dental, Pre-legal, and Child Development programs for three years at this College. If they pursue further prescribed work in their field for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this College. They need not comply with general major-minor requirements as previously outlined. The requirement that at least one quarter (at least 12 credits) of the Senior year must be done in residence at this Institution is waived for such students.

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

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

Courses used to satisfy the English composition, the basic groups, military science or physical education, and freshman orientation requirements as specified under the Lower Division cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation

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

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

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

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

TERMINAL CERTIFICATE

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

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

The general requirements for this Certificate are:

1. Satisfy the entrance requirements.
2. Complete 96 credits, which includes the required work in Physical Education or Military Science.
3. Complete a Major of 30 credits in one or more closely related departments of the School in which the Certificate is granted.
4. Complete a Minor of 15 credits closely related or basic to the Major field. This need not be in the same school.

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

6. Complete 21 credits of elective work.

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

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

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

Requirements for the Degree of Bachelor of Science

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

Before a student can become a candidate for a baccalaureate degree, the abstract of his record in College must show: first, that he has satisfied the entrance requirements as prescribed for the class with which he expects to be graduated; second, that the collegiate work for which he has credit, his conditional and other pending credits, the completion of which 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 planning to complete their work by part-time and summer school, should prepare their applications when they still have 25 to 35 credits to complete. Students will be admitted to candidacy when the plan of course work presented is found to fulfill all remaining requirements for graduation.

Summary of Requirements for Graduation

For students who will graduate in the spring of 1949, the following requirements must be met after satisfying the requirements for admission. The responsibility for satisfying the requirements for graduation rests upon the student concerned.

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

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

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

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

4. Fifty-four credits of Upper Division work taken after the candidate has presented at least 90 college credits, in addition to the required courses in Military Science and/or Physical Education or their substitutes.

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

6. The completion of the group requirements and of the English composition requirements, English 110, or its equivalent, as explained under Lower Division requirements.

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

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

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

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

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 must file an "Application for Graduation" with the Graduation Committee not later than December 2, containing information requested. Any candidate who fails to file his application for graduation by December 2, may be held over to the next year's commencement.

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

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

Requirements for High School Teacher's Certificate

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

GRADUATE SCHOOL

B. L. RICHARDS, *Dean.*

Objectives and Organization

The Graduate School is organized to serve the Educational needs of men and women who have completed their undergraduate work and who desire to qualify themselves further for professional services, or to pursue phases of higher education leading to a teaching or a research career. In all graduate work the major aim is to develop high standards of creative scholarship rather than to fulfill routine course requirements.

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

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

Admission to Graduate School

A graduate with a Bachelor's degree from Utah State Agricultural College or from any other accredited college or university may be admitted to the Graduate School. Seniors in the College who have an average of a "B" or better in all their courses in their junior and senior years and who at the beginning of any quarter lack not more than five quarter credits to complete all requirements for the Bachelor's degree, may be allowed to register for a limited amount of graduate work. All such courses selected for graduate credit must be approved in advance by the Head of the Department and by the Dean of the Graduate School. Graduate credit will not be allowed if the student's total credit for which he is registered during the quarter exceeds 16 hours.

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

Admission to the Graduate School does not imply admission to candidacy for an advanced degree. Such admission is granted by the Dean of the Graduate school only on a recommendation of the Head of the Department and of a special examining and advisory committee as explained below. All students registering in the Graduate School must have their registration card signed by the Dean of the Graduate School. Students who wish to register in the Graduate School should submit their application at least one month before the opening of the quarter in which they plan to matriculate. Every student must provide a certificate of graduation and a transcript of credit. If the transcript of credits does not accompany the application, a date should be specified at which time a transcript will be provided. Blanks for making application can be had from the graduate office.

MASTER'S DEGREE

All approved graduate courses in the College lead to the Master of Science Degree. Majors for the Master of Science degree are offered in all the basic biological, physical, and social sciences, and in the various educational, industrial, and professional divisions as follows: Animal Industry, Crop and Soil Science, Education, Psychology, Engineering, Irrigation and Drainage, Industrial Education, Forestry and Range Management, Home Economics and Microbiology. The specific departments, or groups of departments (over 30

in all) in which the Master of Science degree is given, together with the course service provided by the departments, may be determined by consulting the departmental statements provided in the catalog under the various undergraduate schools of the College.

Requirements and Procedures for Obtaining A Master of Science Degree

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

2. Major Professor and Thesis Director. The applicant will be assigned by the Dean of the Graduate School to a major professor, who in all cases will be a member of the teaching staff of the Department in which the student has chosen to do his major work, and who will be chosen in consultation with the student and the Head of the Department involved. The Major Professor will advise the student in the planning and in the prosecution of his course of study and in his research work, and will function as chairman of the student's Advisory and Examining Committee.

In instances where the thesis chosen by the applicant is based on research best directed by personnel in another department or supported by the Experiment Station or by Federal or other outside agencies, the applicant, with the advice of the Major Professor and the Head of the Department, may be assigned a special Thesis Director. This Thesis Director need not be a member of the teaching staff. He will, however, become a member of the student's committee and will be in part or entirely responsible for the student's research and thesis, and will function in this connection with the Major Professor in directing the student's educational program.

3. Advisory and Examining Committee. This Committee includes the Major Professor, the Thesis Director, when appointed, and three or more members from the faculty of the student's major department or from closely related departments, appointed by the Graduate Dean after consultation with the student and Head of the Department. The Graduate Dean and the Head of the Department are ex officio members of all committees and advisory groups dealing with the student's graduate program. The student's committee will determine the fitness of the candidate to do graduate work and recommend his candidacy to the graduate council, will assist in setting up and finally approving the student's graduate course program and the suitability of the thesis, and individually or as a group serve in an advisory capacity to the student throughout the student's entire graduate candidacy. The advisory and examining committee will be responsible for all qualifying and final examinations.

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

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

5. Program of Study. If the Advisory Committee is convinced that the preparation and ability of the applicant are such as to give reasonable assurance of success in advanced studies, then the committee under the direction of the

Major Professor shall, with the applicant, plan a program of study which will meet all requirements for the Master of Science degree. This program must include:

- (a) At least three quarters of residence. Where courses are critically chosen, four summer sessions with residence research culminating in a thesis may be accepted as fulfilling residence requirements. Under no condition will extension credit or credit transferred from other institutions be permitted to shorten the period of residence.
- (b) At least 45 credits including the thesis in courses numbered 100 or over approved for graduation in addition to any lower or upper division courses which may be necessary to strengthen the undergraduate preparation in his major and minor subject. Under no condition will more than 16 credits be allowed for any one quarter with 12 credits as a maximum for **one-half time**. All courses allowed toward a Master of Science degree must be completed with a grade of "B" or better.
- (c) At least 10 credits in courses numbered 200 or above exclusive of work connected with the thesis.
- (b) A thesis with 9 to 15 credits.

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

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

6. Time Limitation for Admittance to Candidacy. Application for admittance to candidacy must be made before the student has completed more than 16 credits allowed toward his Master's Degree. In this connection it is the responsibility of the Department to evaluate the Student's scholastic record early in his first or probationary graduate quarter or before completion of his 16 credits in order to obtain committee appointment at a date such as will permit committee action in the selection of subsequent courses and of the thesis. Neglect on the part of the department in this responsibility may seriously handicap the student in his subsequent studies. The application blank, with the signature of all members of the student's Advisory and Examining Committee must be returned to the Graduate Dean not later than the end of the fourth week of the quarter preceding that in which the applicant is to complete his graduate work and is to be graduated.

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

Thesis

Each candidate for a Master of Science degree must present a thesis on a topic within the field of his major subject which must represent from 9 to 15 hours of the credit presented for his degree. In all cases, the thesis must represent a contribution to the field of knowledge, based on the student's own research, or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be type-written in standard form and a copy, together with a critically written abstract must be submitted to each member of the student's Advisory and Examining Committee at least two weeks before the date of his final examination. The typewritten copy and the first carbon copy of the final draft, properly signed by the Major Professor, the Head of the Department, and the Dean of the Graduate School, must be submitted to the College Librarian to be deposited in the Library of the College one week prior to date of graduation. If the student is to be graduated at the June commencement, the thesis must be submitted in its final form by May 20 preceding commencement.

Final Examination

Each candidate for a Master of Science degree will be required to pass a comprehensive final examination on the subjects of his graduate study and on his thesis. This examination may be oral or written or both as his committee may decide, and is open to all faculty members and officials of the Graduate School. Arrangements for the time and place of the examination will be made by the Dean of the Graduate School. A member of the Advisory and Examining Committee, other than the Major Professor, or a representative of the Graduate Council, will be appointed to act as chairman of the examination and will submit to the Graduate Council the results of the examination. For candidates who are to receive their degree at the June commencement the date of the final examination should not be later than May 15. When the examination is passed and the thesis submitted and deposited with the Librarian, the Dean of the Graduate School will present the name of the candidate to the College faculty for approval. He will also instruct the candidate regarding attendance at commencement and on other matters relating to his graduation.

Time Limit for Completing Work for a Master's Degree

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

Extension Courses

The amount of extension credit to be allowed will be determined in consideration of the 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 will not be granted for correspondence study.

Transfer Credit

A maximum of 9 quarter credits of graduate work satisfactorily completed at another approved Graduate School may be allowed toward a Master of Science Degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the student's Advisory and Examining Committee subject to the approval of the Dean of the Graduate School and the Graduate Council. In no case will graduate credit received in other institutions be transferred either for credit or in lieu of residence until the student has satisfactorily completed at least 16 credits in residence at the Utah State Agricultural College.

THE DEGREE OF DOCTOR OF PHILOSOPHY

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

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

Graduation at Close of Summer Session

All students who satisfy the requirements for graduation by the close of the Summer Quarter are listed with the class of the following year and will receive their public graduation at the following Commencement. The graduation of such students however, will be certified by the proper authorities of the College as soon as their work is completed.

Teaching and Research Assistantships

A number of teaching and research assistantships in various departments of the College are available each year to graduate students. Teaching assistantships carry a stipend of \$675 for one-third time teaching service on a nine-month basis. Remuneration for research assistantships may vary from \$675 to \$1,200 dependent upon the time of service involved. All assistantships are arranged so as to allow the student to complete work for his Master's Degree in two years. At the present, assistantships are available in the following departments: Agronomy, Soils, Soil Physics, Animal Husbandry, Bacteriology, Botany and Plant Pathology, Biochemistry, Chemistry, Dairy Manufacturing, Economics, Education, Agricultural Engineering, Civil Engineering, Engineering and Technology, Physiology, Foods and Nutrition, Child Development, Forestry, Geology, Irrigation and Drainage, Physics, Physical Education, Political Science, Poultry, Public Health, Range Management, Soils and Soil Physics, Sociology, Veterinary Science, Wild Life, Zoology and Entomology.

STUDENT EXPENSES

1948-49

Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	<u>\$100.00</u>	<u>\$ 72.00</u>	<u>\$ 43.00</u>	<u>\$ 43.00</u>	<u>\$ 43.00</u>

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

Non-Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00	\$ 55.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	<u>\$145.00</u>	<u>\$117.00</u>	<u>\$ 88.00</u>	<u>\$ 88.00</u>	<u>\$ 88.00</u>

If a non-resident student wishes to attend all three quarters but pay fees on a quarter basis, the payments are divided as follows: Fall, \$88; Winter, \$29; Spring, \$28; making a total of \$145.00.

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

Agriculture	\$4.00	Forestry	\$4.00
Arts and Sciences	3.00	Engineering and Technology	5.00
Commerce	2.00	Home Economics	3.00
Education	2.00		

The fees listed above with the exception of the Associated Students (Student Body) fees are the minimum fees required by state law. According to an act passed by the Legislature, all legal residents of Utah who enter the College must pay a registration fee of \$10, and, in addition, they must pay a tuition fee of \$17 per quarter. Students who are not legal residents of the state are required to pay a registration fee of \$55, covering the entire year in addition to the tuition fee of \$17 per quarter.

SPECIAL FEES 1948-49

Special Students—Registration fee	\$10.00
Plus \$2.50 per credit hour (maximum 6 credits)	
Chemistry Laboratory deposit	5.00
Bacteriology 2, 71, 105, 107, 110, 120, 130, 160, 167, 197, 198, 199	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.	
Diploma Fee	5.00
Cap and Gown rental—Bachelor of Science	1.75
Master of Science	4.00
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, 58¢ per clock hour (or per contract with the Veterans' Administration.)	

Graduate students not in residence and wishing to file thesis credit not to exceed 15 hours shall pay a fee of \$10.00.

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 Private Instruction, Music. The charge is on the basis of 1½ credit hours per quarter. Authorized instructors are as follows:

Christiansen, N. W.,	\$35.00	Smith, Mrs. Eleanor J.,	\$20.00
Christiansen, Mrs. N. W.,	30.00	Sorensen, Mary Jean	20.00
Clark, S. E.	30.00	Thatcher, Mrs. G. W.	35.00
Hughes, John	20.00	Thatcher, Patience	35.00
Lund, Max	25.00	Torbensen, Eldon	30.00
Lundquist, Thelma	20.00	Wasserman, Irving	30.00
Pahtz, George	30.00	Welti, Walter	35.00
Poznanski, Mischa	30.00	Welti, Mrs. Walter	30.00
Sigler, Norma	20.00		

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

Hardman, Stuart	Morgan, Floyd T.	Rosenthal, W. M.
Hansen, Harold I.	Myers, Chester J.	Thornley, Gwendella
Jones, E. LeRoi	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 \$10.00 to \$12.00 a week. By renting rooms and boarding themselves, students are able to reduce considerably the cost of room and board.

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

SCHOLARSHIPS, FELLOWSHIPS, AWARDS

THE Johansen Scholarship Fund of \$5,000, a gift of the late Mrs. Johana Johansen, provides six scholarships annually, worth in the aggregate from \$250 to \$300, for help of worthy students of Junior and Senior rank. Applications for this scholarship for the succeeding year must be filed with the chairman of the Awards and Honors committee on or before April 1.

The Lieutenant Clyde Parker Baugh Memorial Fund of \$10,000, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership. Applications must be submitted by April 1 to Awards and Honors Committee chairman.

KSL Meritorious Scholarships. KSL awards two scholarships, one in technical radio work and one in script writing or broadcasting. Applications should be presented to chairman of Awards and Honors Committee by April 1.

The 1927 Class Gift to the College yields an annual income sufficient to provide two scholarships of \$125 each. Application should be made by Juniors to the Awards and Honors Committee on or before April 1. Application must be accompanied by an approved outline of a proposed study project to be completed during the senior year and submitted to the Awards and Honors Committee not later than April 1. Two copies of the complete thesis are to be filed in the College library.

The Rhodes Scholarships. A number of candidates for the Rhodes Scholarships in Oxford University, England, are selected each year from the State of

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

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

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

Sears Roebuck and Company Scholarships:

For Freshmen in the School of Agriculture the company offers 25 scholarships of \$100 each, \$50 of which is paid at the beginning of the fall term and \$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 of one or two more years. All applications must be submitted to the Dean of Agriculture before June 1. Application blanks and additional information may be obtained from the Dean's office.

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

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

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

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

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

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

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

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

Home Economics Scholarships and Fellowships

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

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

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

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

SCHOLARSHIPS AND AWARDS

An Annual Scholarship of \$25 is awarded by Chi Omega Fraternity to the girl majoring or minoring in Social Sciences who gives evidence of superior scholarship and ability to make a contribution to organized group life.

The Committee of Awards is appointed by Chi Omega Fraternity each year from the teaching staffs of the Sociology and Economics Departments.

Medals and Other Awards

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

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

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

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

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

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 student of the Junior Class in Commerce who possesses the highest scholastic average for three years of work taken in this College.

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

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

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

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

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

- (a) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, natural ability and talent (50 points); and
- (b) His patriotism, honesty, and good judgment as a student citizen, as an indication of his future attitude as a voter or public servant, combining a progressive spirit with a love of country and a concern for the safety and development of American institutions of liberty and justice and his qualities of social leadership, as shown in student affairs, based upon physical and moral cleanliness and strength of character (50 points).

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

Loan Funds

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

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

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

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

GUIDANCE PROGRAM

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

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

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

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

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

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

STUDENT HEALTH SERVICE

The College is interested in the physical welfare of its students. Services of a doctor and a full-time registered nurse are available free of charge to the students. Each new student, upon entering the College, receives a thorough medical examination, and whenever necessary, students are re-examined and advised regarding their physical condition. The College pays for x-rays and emergencies which occur on the campus or during competitive athletics. The physician is on call at all times for illnesses and emergencies occurring off the campus and in student's homes.

SPEECH CLINIC

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

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

PSYCHOLOGICAL CLINIC

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

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

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

MARRIAGE COUNSELING SERVICE

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

COLLEGE CITIZENSHIP

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

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

RELIGION

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

Outstanding religious leaders of the Catholic, Protestant and Latter-day Saint faiths cooperate with the College in serving the students of their respective churches.

The L. D. S. Institute of Religion, which is adjacent to the College, offers accredited courses in religion. The educational and recreational facilities of this religious center are open to all students registered at the College.

COURSES OF INSTRUCTION

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

Courses numbered below 100 are Lower Division courses.

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

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

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

SCHOOL OF AGRICULTURE

R. H. WALKER, *Dean*

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General Information

THE well trained person is the one who receives employment opportunities in agriculture as well as in other fields of endeavor. Opportunities in crop and livestock production, marketing, extension work, teaching, research, and the various commercial fields connected with agriculture await students who have an adequate background of basic and technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest and disease control methods are needed to rehabilitate territories despoiled by war. Increase of soil fertility through prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution by trained men. Thus a great opportunity and a challenge are open to those students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

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

Instruction includes not only the principles, but the practice of agriculture. The College farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards, and technical equipment offer excellent opportunities for the combination of scientific study and practical experience. Outstanding representatives of the principal livestock and poultry breeds best adapted to Utah conditions afford a "standard of perfection" in desirable type and form for the student judge.

The College maintains an outstanding herd of Hereford and Shorthorn beef cattle. Advance Domino 3d, Hereford herd sire, was donated by Sears, Roebuck and Company. The Shorthorn herd is headed by an imported bull, Cadet's Guard. Five breeds of sheep, Rambouillet, Columbia, Hampshire, Corriedale, and South-downs, are maintained for comparative study. Duroc swine, registered Perchon horses, and a thoroughbred Remount stallion are also kept. The College dairy herd is made up of purebred Jersey and Holstein-Friesian cattle. S. C. White Leghorns, New Hampshire and Rhode Island Reds and Barred Rock chickens and Broad-breasted Bronze turkeys are available in the poultry yards. These animals and poultry affords teaching materials and also experience in the care and handling of livestock.

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

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

Students entering the School of Agriculture may pursue one of four courses leading to the degree of Bachelor of Science in Agriculture.

COURSE IN GENERAL AGRICULTURE

The course in general agriculture is designed to meet the needs of those students who desire a broad general training in scientific and practical agriculture, and wish to qualify for general farming, for extension service, county agent, or agricultural inspection work, or other types of work in general agriculture. The curriculum for this course is partially prescribed as outlined on this page.

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

COURSE OF STUDY FOR MAJORS IN GENERAL AGRICULTURE

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

(a) Minimum Requirements in Following Divisions:

	Credits	
Agricultural Economics	9	
*Applied Plant Sciences	26	
**Applied Animal Sciences	26	
Engineering and Technology	9	
TOTAL	70	

(b) Exact Science, Biology, General Social Science, and Languages.

	Credits	Total
EXACT SCIENCE		
Math 34 or 35	3 or 5	
Chem. 10, 11 & 12 or equiv.	15	18 or 20
BIOLOGY		
Botany 25	6	
Bacteriology 1 & 2 or 70 & 71	5	
Zoology 2 or 3 and 4	5 or 10	
Zoology 112	5	
Entomology 108	5	
Botany 130	5	31 or 36
GENERAL SOCIAL SCIENCE		
Soc. 10 or Pol. Sci. 10, or Hist. 14	5	
Agr. Econ. 52a & 53b	6	11
LANGUAGES AND ART		
English 10 & 110	9	
Language and Arts Group	8	17
		77 to 84
Total credits prescribed	149	
Elective	37	
TOTAL	186	

*Not more than 15 credits of the 26 to be taken in one department, and the total of 26 credits to be selected from each of the four departments: Agronomy, Horticulture, Landscape Architecture and Planning, and Vegetable Crops. Soils 56 is required as part of the 26 credits.

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

COURSES IN SPECIALIZED AGRICULTURE

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

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

Agricultural Economics and Marketing	Horticulture
Agronomy	Landscape Architecture & Planning
Animal Husbandry	Poultry Husbandry
Dairy Industry	Vegetable Crops

He must also complete the following courses:

Mathematics 34 or 35	Science 10, or History 14
Chemistry 10, 11, 12, or 3, 4, 5	Language and Arts, 8 credits
Agricultural Economics 53a and 53b	English 10 and 110
Sociology 10 or 70, or Political	Agronomy 56

A minimum of 14 credits in the following courses:

Botany 24 and 25	Bacteriology 1, 2, 70
Zoology 2, 3 and 4	Zoo. 1 or Bot. 1
	Phy. 4

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

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

EXTENSION METHODS CLASS

151. **Extension Methods.** For prospective Home Demonstration and County Agricultural Agents. This course includes study of the 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. (3; F or S.) *Extension Staff*

CURRICULUM FOR TRAINING TEACHERS OF VOCATIONAL AGRICULTURE

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

The broadness and extent of the training is such that a major part of this program is prescribed. This curriculum has been planned to meet the Utah Requirements for Certification as effective September 1, 1946.

**PRESCRIBED COURSE OF STUDY FOR MAJORS IN
VOCATIONAL AGRICULTURAL EDUCATION**

Institutional and General Requirements

Exact Science:

	Cr.	Tot.
*Chemistry 10, 11, 12	15	
*Physics 3	5	
*Mathematics 34	3	23
	—	

	Cr.	Tot.
*Speech or	5	
*World Literature	5	
Journalism	3	8
	—	

Biological Science:

*Botany 25	6	
*Zoology 2	5	
Zoology 112 (Genetics)	5	
*Bacteriology 1, 2 or 70, 2	5	21
	—	

English:

Sophomore Composition (10)	5	
Advanced Composition (110)	4	9
	—	

Language and Arts:

(Select 8 Credits)
*Landscape Architecture 3.. 3

Social Science:

*Agr. Econ. 53a, 53b	6	
*Sociology 10 or 70 or		
*Political Science 10 or		
History 14	5	11
	—	
		75

*Meets lower division group requirements

Basic Requirements in Agriculture

Animal Industry:	Cr.	Tot.	Agricultural Economics:	Cr.	Tot.
Animal Husb. 10	5	5	Ag. Econ. 102	3	
Plant Industry:			Principles of Marketing	3	6
Agronomy 56	4	4		—	
			Irrigation and Drainage:		
			Irrig. & Dr. 10	4	4

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

Animal Industry†	Cr.	Tot.
Basic courses	5	
Elective	15	20
	—	

Plant Industry†	Cr.	Tot.
Basic (Soils 56)	4	
Elective	16	20
	—	

Agricultural Economics	Cr.	Tot.
Basic	6	
Elective	6	12
	—	

Agricultural Engineering (Including Irrigation)	Cr.	Tot.
Basic	4	
Elective	16	20
	—	

EDUCATION

Basic

Education 112, 113, 114, 125, 126	22	
Psychology 102	5	
School Health 155	3	
Elective	3	33
	—	

Total Requirements

Agriculture	82
Education	33
Institutional and General	75

Elective courses must be selected from at least two departments.

TECHNICAL COURSES IN AGRICULTURE

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

NON-DEGREE COURSE IN AGRICULTURE

The School of Agriculture also offers a two-year non-degree course in practical agriculture for student 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. Emphasis is placed on practical farm problems.

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

Agricultural economics 53a, & 53b, 70, 102, 110.

Agricultural engineering 14a, 15a

Agronomy 1, 56

Animal husbandry 1, 10

Dairy husbandry 1, 3

Horticulture 1, 8

Irrigation and drainage 10

Landscape architecture 3

Poultry husbandry 1 & 2

Vegetable crops 1

Veterinary science 10

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

	Credits
English 2	3
English 10	5
Math. 34	3
Pol. Science 10, or History 14, or Sociology 10 or 70	5

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

Agricultural Economics and Marketing

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

W. P. THOMAS, G. T. BLANCH, W. W. OWENS, *Professors*; D. A. BROADBENT, V. L. ISRAELSEN, G. A. CARPENTER, R. H. ANDERSON, *Associate Professors*; E. M. MORRISON, E. W. LAMBORN, M. H. TAYLOR, *Assistant Professors*; R. R. PAYNE, *Research Assistant*; H. R. HOCHMUTH, L. A. REUSS, *Collaborators in Research*.

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

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

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

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

Rural Economy

53a and 53b. Principles of Economics. Basic principles of Economics with emphasis on those of particular importance in Agriculture and Forestry. (3; F or W.) *Israelsen, Broadbent and Morrison*

54. Principles of Agricultural Economics. Emphasis on the application of economic principles to the solution of agricultural problems. (3; F.) *Blanch*

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

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

Farm Management, Land Economics, and Agricultural Finance

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

102a. Principles of Farm Management. Principles underlying organization, management, and financial success of farms. Rates of production, labor efficiency, combination of enterprises and farm layout. (3; F, W or S.)

Blanch and Broadbent

102b. Principles of Farm Management. Laboratory. (2; F, W, or S.)

Blanch and Broadbent

105. Agricultural Credit. Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. (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. (5; S.)

Blanch

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

Blanch

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

Morrison

206. Land Appraisal and Classification. A basic course in land appraisal and economic classification of land. (2; S.)

Blanch

Marketing and Prices

62. Principles of Marketing. Principles, methods and practices of marketing for students in Commerce, Home Economics, and Agriculture. (5; W or S.)

Broadbent and Anderson

110. Marketing Agricultural Products. Principles, problems and methods of marketing agricultural products. (3; F.)

Broadbent

113a. Farm Cooperatives. Principles of cooperation and methods of organization, operations, and management of cooperative sales, purchasing and service associations. (3; S.)

Thomas

113b. Analysis of Farm Cooperatives. For students who desire detailed work in organization and management of cooperatives. Prerequisite: Ag. Econ. 113a. (2; S.)

Thomas

114. Marketing Fruits and Vegetables. Production and marketing factors as they relate to the marketing of fruits and vegetables with special reference to Utah conditions. (3; W.)

Lamborn

116. Marketing Livestock and Livestock Products. Production and marketing factors as they relate to the marketing of livestock and livestock products with special reference to Utah conditions. (3.)

Broadbent

120. Agricultural Prices. Price relationships together with the state and national agricultural outlook reports. (3; S.)

Thomas

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

Israelsen

121b. Statistical Methods. Application of statistical techniques to specific price and production problems. (3; W.)

Israelsen

262. Advanced Marketing. Principles of marketing and their applications to specific problems. Prerequisite: Ag. Econ. 53a, 53b and one course in Ag. Marketing. (3; W.)

Lamborn

General Graduate Courses

210a. Research Methods in Agricultural Economics. (3; F.)

Blanch

210b. Research Methods and Techniques Applied to the Field of Agricultural Economics. Prerequisite: Ag. Econ. 210a. (2; W.)

Staff

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*

Agronomy

R. J. EVANS, *Professor Emeritus*; D. W. THORNE, D. S. JENNINGS, D. W. PITTMAN, A. F. BRACKEN, D. C. TINGEY, *Professors*; H. B. PETERSON, *Associate Professor*; W. H. BENNETT, G. L. STOKER, LEMOYNE WILSON, *Assistant Professors*; GOLDEN KILBURN, *Extension Conservationist*; GLENN T. BAIRD, *Extension Agronomist*; J. W. CARLSON, J. L. HADDOCK, WESLEY KELLER, C. W. LAURITZEN, M. W. PEDERSON, J. P. THORNE, D. F. TRUSSELL, R. W. WOODWARD, *Collaborators in Research, U. S. D. A.*

Bachelor of Science Degree in Agronomy

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

Major in General Agronomy

A major in General Agronomy prepares the student for positions related to the management of soils and the production of field crops. Students interested in soil conservation and agronomic aspects of land reclamation usually major in general agronomy, but may partially specialize in either crops or soils. Training in general agronomy is preparatory to civil service positions such as agronomists, conservationists, farm planners, and soil scientists. Many Agronomy majors are also employed in commercial fields such as field men for sugar beet companies, seed companies, fertilizer distributors, and canning companies. Special course outlines have been prepared to train students for such field positions. Studies in General Agronomy are also designed to meet the needs of students who desire to farm, to be county agricultural agents, or to take field positions related to soils or crop production with various other state and federal agencies.

In addition to the general college and School of Agriculture requirements, all majors in General Agronomy are required to take the following courses: Geology 3, Botany 24 and 25, Bact. 1 and 2, Math. 44 or 46, and Agronomy 56, 101, 102, 103, 107, 111, 112, 155.

Major in Technical Field Crops

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

In addition to the general college requirements, majors in Technical Field Crops will be required to take the following courses: Chem. 3, 4, 5, 121, 122; Math. 99; Bot. 24 and 25, 120 or 130; Bact. 1 and 2; Irrig. and Dr. 10; Agron. 56, 101, 102, 103, 107, 109, 111, 112, 114, 115a and b. A suggested outline of courses may be obtained from the Agronomy Department.

Major in Technical Soils

Majors in Technical Soils are prepared for graduate work and technical employment in reseach, soil testing, land classification, and soil management. Students of high scholastic standing with marked ability in the fundamental sciences will find distinct opportunity in this major.

In addition to the general college requirements, students in Technical Soils will be required to take the following courses: Chem. 3, 4, 5, 117, 118, 121, 122; Math. 99; Physis 20, 21, 22; Geol. 3; Bot. 24 and 25; Bact. 1 and 2; Irrig. and Dr. 10; Agron. 56, 101, 102, 103, 107, 111, 112, 114, 115a and b, 155; A suggested outline of courses may be obtained from the Agronomy Department.

Major in Irrigation and Soils

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

An outline of courses with further details concerning course requirements and employment opportunities can be obtained from the Department of Agronomy or the Department of Irrigation and Drainage.

Master of Science Degree

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

The following department courses in the one hundred series are acceptable for graduate credit toward the Master of Science Degree in the department: 109, 115 a and b, 155, 160, 170.

The following courses in the one hundred series are acceptable for graduate credit for Master of Science Degree candidates in related departments: 101, 102, 103, 107, 109, 114, 115, 125, 155, 160, 170.

Doctor of Philosophy Degree

The Agronomy Department in cooperation with a number of related departments is approved for the offering of advanced study and research for the attainment of the degree of Doctor of Philosophy in specialized fields of soil science in relation to irrigation agriculture. More detailed information may be obtained from the department or the Dean of the Graduate School.

A Suggested Course in General Agronomy

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Math. 34	3	Ag. Econ. 53b	3	Bacteriology 1 & 2	5
Ag. Econ. 53a	3	Math. 35	5	Math. 44	3
Botany 24	5	Botany 25	5	Poultry 1 & 2	4
Agron. 1 or Hort. 1	3	Agron. 10	1	Veg. Crops 1 & 2	4
Landscap 3	3			Electives	1
	<hr/>		<hr/>		<hr/>
	17		17		17
Sophomore					
Language and Arts	3	Eng. 10	5	Chem. 5	5
Geol. 3	5	Chem. 4	5	Agron. 56	4
Chem. 3	5	Dairy 1	3	Chem. 12	4
Agron. 18	3	Electives	3	Electives	3
	<hr/>		<hr/>		<hr/>
	16		16		17

Fall		Junior Winter		Spring	
Courses	Credit	Courses	Credit	Courses	Credit
Agron. 107	5	An. Hus. 10	5	Ent. 108	5
Agron. 102	3	Agron. 101	3	Agron. 103	4
Irrig. & Dr.	4	Agron. 115b	3	English 110	4
Agron. 115a	3	Soc. Sci.	5	Agron. 114	3
Electives	2				
	17		16		16
		Senior			
Zoo. 112	5	Agron. 109	4	Range Mgt. 160	5
Botany 130	5	Agron. 112	1	Agron. 125	3
Agron. 111	1	Agron. 155	3	Ag. Econ. 102	3
Electives	6	Agron. 160	3	Electives	6
	17	Electives	6		
			17		17

NOTE: See School of Agriculture requirements on page 65.

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

Farm Crops

1. **General Farm Crops.** Introductory course in crop production. (3; F, W, or S) *Bennett*

4. **Commercial Grading.** Application of the Federal Standard in the grading of field crops. (2; W.) *Staff*

18. **Weeds.** Identification of weed seeds and plants, the weed problems in agriculture and methods of control. An assessment is made for field trips. (3; F) *Tingey*

101. **Cereal Crops.** The classification, history and cultural methods involved in production of cereal crops. (3; W, or S.) *Bracken*

102. **Root and Miscellaneous Crops.** Sugar beets, potatoes, cotton, tobacco, mangels, and other root crops are studies in detail as to cultural methods, market types, and commercial possibilities. (3; F.) *Bennett*

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

105. **Seed Analysis and Testing.** Impurities of farm and garden seeds; methods of analysis and testing; the inspection and marketing of seeds. Not given except on application of three or more students. (1 or more credits; F, W or S.) *Tingey*

109. **Plant Breeding.** The principles and practices of plant breeding, technique and improvement by selection and hybridization. Prerequisite: Zoo. 112. (4; W.) *Tingey*

124. **Advanced Judging, Grading and Identification.** Prerequisites: Agron. 104 and 118. (2; S.) *Staff*

201. **A. Pastures and Hay; B. Alfalfa; C. Sugar Beets and Potatoes; D. Cereals; E. Weeds.** This course deals with technical phases of recent advances in crop production and improvement. Each subject carries two credits. *Staff*

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

213. **Crops Seminar.** Current scientific topics in farm crops. Required of all graduate majors. (1; F, 1; W, 1; 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. (4; F, W or S.) *Staff*

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

58. General Soils. Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Prerequisite: Inorganic Chem. (5; S.) (Credit not given for both 56 and 58.)

Pittman

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

Staff

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

Stevens

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

Wilson

125. Soil Conservation. Special problems of soil management and land policy in relation to soil conservation. Practice in making use of soil conservation surveys in planning farms on a soil conservation basis. Prerequisites: (3; S.)

Peterson

150. Special Problems.

Staff

155. Soil and Plant Relations. Plant and soil relationships with respect to physical environment and the availability and absorption of minerals. Laboratory in soil and plant analysis in relation to soil productivity. Prerequisite: Agron. 56. (3; W.)

Thorne

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

Jennings

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

Staff

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

Staff

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

Gardner

- 224. A. Management of Irrigated Soils.
B. Saline and Alkali Soils.
C. Range and Forest Soil Problems.
D. Soil Classification.
E. Genesis and Morphology of Soils.
F. Soil Conservation.
G. Soil Chemistry.
H. Soil Physics.**

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

Staff

227. Modern Techniques in Soil Research. Readings and discussion in theory and practice in the use of recently developed field and laboratory equipment used in research in the field of soils. Laboratory practice is given in the direct operation of equipment discussed and in the interpretation of data obtained. (3; W.)

Staff

SPECIAL COURSES

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

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

115a, 115b. Biometry. Application of statistical principles to the design of biological experiments and the analysis of the data. Prerequisite: Math. 35 or equivalent. (3; F. 3; W.) *Crandall*

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. (2; S.) *Bracken*

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. (3; W.) *Pittman*

215. Experimental Methods in Agronomic Research. The design of experiments, technique and methods of procedure, analysis and interpretation of results. (3; S.) *Staff*

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

Animal Husbandry

L. L. MADSEN, A. C. ESPLIN, G. R. HENDERSON, T. D. BELL, *Professors*; L. E. HARRIS, *Associate Professor*; J. A. BENNETT, M. A. MADSEN, M. BROADBENT, *Assistant Professors.*

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

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

Graduate work leading toward the master of science degree is offered in animal breeding, nutrition, and production. Courses numbered 201 and above are designated for graduate students. Courses 110, 120, 125, 150 and 155 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the department chairman. Students who plan to do graduate work may be admitted to the technical course in Animal Husbandry by permission of the department chairman and the dean. For such students a minor in chemistry, physiology or zoology is suggested.

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

2. Animal Husbandry Laboratory. Laboratory exercises in judging, market classification and practical problems. Should be taken at the same time as A.H. 1. (2; F or S.) *M. A. Madsen*

10. Feeds and Feeding. Differences in digestive tracts of farm animals and the physiology of digestion and feed utilization, the composition of feeds, the

balancing of rations, and a discussion of feeding of farm animals. (5; W or S.) *Harris*

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

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

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

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

120. Swine Production. Systems of production with emphasis on those suited to western conditions, breeds of swine, management and feeding of the breeding herd, and feeding for market. The relation of the industry to dairy farming. Prerequisite: A. H. 10. (2; W.) *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 adaption to the different husbandry practices. Prerequisite: A. H. 10. (3; W or S.) *M. A. Madsen*

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

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

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

160. Livestock Production Problems. Attention is given various problems in livestock production, particularly in Utah. Students are expected to apply knowledge acquired in previous courses in the solution of problems they will face in the field after graduation. Prerequisites: A. H. 110 and 125. (3; W.) *M. A. Madsen*

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

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

185. Meats. Selecting and slaughtering beef, sheep and swine, including grading, cutting, curing, canning and freezing meats for storage. Two lectures, one lab. (3; W.)

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: A.H. 155. (2-6; F, W or S.) *Bennett*

210. **Problems in Animal Nutrition.** Same as A.H. 201, except work is in animal nutrition. Prerequisites: A.H. 150, 151. (2-6; F, W or S.)

L. L. Madsen and Harris

215. **Nutrition Laboratory.** Review and practice in techniques used in nutrition research. Two laboratory periods. 2; F or W.) May be repeated.

L. L. Madsen and Harris

220. **Problems in Animal Production.** Same as A.H. 201, except work is in animal production. Prerequisite: A.H. 160. (2-6; F, W or S.)

Bennett and M. A. Madsen

230. **Animal Breeding Research.** Students outline a research problem in some phase of animal breeding, making a critical review of pertinent literature, collect, analyze necessary data and prepare a report of the work done. 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 some phase of animal nutrition. (2-5; F, W or S.)

L. L. Madsen and Harris

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

Bennett and M. A. 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 discussions relate to nutrition, breeding, and production during Fall, Winter and Spring, respectively. One credit (may be repeated). (F. W. S.)

Staff

Bacteriology and Public Health

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

J. E. GREAVES, *Professor Emeritus*; W. W. SMITH, *Chairman*; W. B. PRESTON, *Professors*; K. R. STEVENS, *Associate Professor*; L. W. JONES, W. R. SCHOLLES, *Assistant Professors*; ANN BURNS, D. W. WILL, *Instructors*.

Bachelor of Science Degrees in Bacteriology and Public Health

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

To qualify for the Bacteriology major in the Technical course in Agriculture, (see page . . .) students should take: Bacteriology 1 or 70, 2 or 71, 104, 105, 110, 120, 160, 170, 180, 191, 192, 193, Botany 24, 25, 130, 150, 151, Chemistry 3, 4, 5, 117, 118, 121, 122, 191, Mathematics 35, 46, Physics 21, 22, Public Health 50, Zoology 3, 4 and 116. See Bacteriology and Public Health in the School of Arts and Sciences for other degree offerings.

See pages 43 and 44 for courses which may satisfy group requirements.

Master of Science Degree in Bacteriology

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

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

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

Courses numbered over 200 are largely restricted to graduate students.

Bacteriology

1. **Elementary Bacteriology.** Biology and significance of bacteria and other microorganisms; their morphology and physiology; fundamental principles

governing bacteriology of water, sewage, milk, food sanitation, communicable diseases, etc. Where possible this course should be accompanied by Bact. 2 or 71. (4; F, W or S.) *Greaves, Stevens, Jones*

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

3. Bacteriological Demonstration. A demonstration of the more important experiments, principles, and fundamentals of Elementary Bacteriology. One, one-hour laboratory demonstration. Prerequisite: Concurrent or previous registration in 1. One credit. (Not offered in 1948-49.)

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

71. General Bacteriology Laboratory. Basic laboratory methods and laboratory observation of fundamental bacteriological principles. Prerequisite: Previous or concurrent registration in Bacteriology 1 or 70. (2; F.) *Will*

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

105. Dairy Bacteriology Laboratory. Experiments to demonstrate the fundamentals discussed in the lecture course. Two three-hour laboratory periods. Prerequisite: 2 or 71, previous or current registration in 104. (2; S.) *Jones*

107. Systematic and Determinative Bacteriology. The isolation, identification, and classification of bacteria. Prerequisite: Bact. 2 or 71. One lecture and two three-hour labs. (3; F.) *Smith*

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

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

131. Clinical Laboratory Methods. Discussion and practical experience in the laboratory methods used in the diagnosis of disease. Prerequisites: Bact. 2 or 71, Organic Chem. (5; F.) *Will*

132, 133. Advanced Clinical Laboratory Methods. (5; W. 5; S.) *Will*

140. Standard Methods of Water Analysis. The techniques and significance of the standard tests of water and sewage. Prerequisites: Bact. 2 or 71, Organic Chem. (3; W.) *Jones*

160. Pathogenic Bacteriology. The properties and characteristics of pathogenic microorganisms and their relation to the cause, prevention, and control of infectious diseases. Prerequisites: Bact. 2 or 71. Three lectures and two three-hour lab. periods. (5; W.) *Smith, Will*

162. Viruses. The main characteristics of the viruses diseases. Prerequisites: Bact. 160. (2; W.) *Jones*

164. Pathogenic Molds and Yeasts. The culture and identification of the principle fungi, pathogenic for man and animals. (2; S.) *Will*

166. Immunology. A study of immunity. Prerequisite: Bact. 1 or 70. (2; S.) *Greaves*

167. Serological Methods. The use of antigen-antibody reaction in the diagnosis of disease and in the identification of bacteria. Prerequisite: Bact. 160. (3; S.) *Will*

170. Industrial Bacteriology. The role of microorganisms in industrial fermentations. Prerequisites: Bact. 2 or 71, Organic Chem. (Not offered in 1948-49.) *Stevens*

180. Metabolism of Bacteria. The composition of and chemical transformations due to microorganisms. Prerequisites: Bact. 1 or 70, Organic Chem. (4; S.) *Jones*

190. History of Bacteriology. The men and discoveries that lead to modern bacteriology. Prerequisite: Bact. 1 or 70. (2; Summer.) *Smith*

191, 192, 193. Proseminar. Prerequisites: Bact. 1 or 70, senior status, and approval by the department chairman. (1; F. 1; W. 1; S.) *Staff*

197, 198, 199. Bacteriological Problems. Closely supervised library or laboratory study in a selected problem in bacteriology. Prerequisite: Bact. 2 or 71, plus one upper division course in Bacteriology. (2; F. 2; W. 2; S.) *Staff*

210. Problems in Soil Microbiology. Special assignments, reports and discussions. Review of literature in various phases of soil microbiology, and preparation of a comprehensive and critical review of at least one phase of the subject. (2-5; W.) *Stevens, Jones*

220. Problems in Food Microbiology. Special assignments, reports and discussions. Review of literature of various phases of food microbiology, and preparation of a comprehensive and critical review of at least one phase. (2-5; F.) *Stevens, Jones*

260. Problems in Pathogenic Bacteriology. Special assignments, reports and discussions. Review of literature in various phases of pathogenic bacteriology, and preparation of a comprehensive and critical review of at least one phase of the subject. (2-5; W.) *Smith*

267. Problems in Serology. Special assignments, reports and discussions. Review of literature in various phases of serology, and preparation of a comprehensive and critical review of at least one phase. (2-5; S.) *Smith*

270. Problems in Industrial Bacteriology. Special assignments, reports and discussions. Review of literature in various phases of industrial bacteriology, and preparation of a comprehensive and critical review of at least one phase. (2-5; W.) *Stevens, Jones*

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

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

291, 292, 293. Seminar. Prerequisite: graduate status and approval of department chairman. (1; F. 1; W. 1; S.) *Staff*

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

Biochemistry—See Chemistry 190-197.

General Virology—See Botany 135.

Microbiological Assay—See Chemistry 194.

Mycology—See Botany 151.

Parasitology—See Zoology 116.

Public Health

50. Elementary Public Health. Function and organization of Health Departments. Transmission, prevention, and control of communicable diseases. Public Health relation to non-communicable diseases. (3; F, W or S.) *Jones, Scholes, Smith*

51. Prevention of Disease. The types of diseases. Prevention and control of diseases. (2) Not open to students with credit in P.H. 50. *Smith*

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

60. Student Health Problems. Designed to meet health problems of the college student. (Not open for credit to students with credit in Zoo. 11, or Bact. 15.) (2; F or W.) *Scholes*

144. Sanitation and Public Health. The control of the environment; public health administration. Prerequisite: Bact. 1 or 70. (3; S.) *Scholes*

151. Community Health. The organization and functioning of official and non-official health agencies in the fields of maternal, infant, pre-school, school

and adult hygiene in the light of modern trends and present social needs. Local health problems, especially rural problems. Prerequisite: P. H. 50. (3; W.)
Scholes

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

160. **Pathogenic Bacteriology.** (See Bacteriology 160.)

162. **Viruses.** (See Bacteriology 162.)

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

166. **Immunology.** (See Bacteriology 166.)

167. **Serological Methods.** (See Bacteriology 167.)

Botany and Plant Pathology

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

B. L. RICHARDS, F. B. WANN, *Professors*; E. L. WALDEE, *Associate Professor*; GEORGE W. COCHRAN, *Associate Research Professor*; W. S. BOYLE, *Assistant Professor*; ARTHUR H. HOLMGREN, *Assistant Professor and Curator of the Intermountain Herbarium*; R. A. BUSH, *Instructor*; BASSETT MAGUIRE, *Curator New York Botanical Garden, Non-Resident Professor*; BRYCE N. WADLEY AND GEORGE KALOOSTIAN, *Collaborators, U. S. Department of Agriculture.*

Bachelor of Science Degree in Botany

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

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

Recommended additional courses for specialized fields: Pathology: 121, 131, 135, 140, 151; Taxonomy: 104, 108, 112; Physiology: 121, 224, 228; Cytology 118.

See pages 43 and 44 for courses which may satisfy group requirements.

Master of Science Degree in Botany

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

The following courses may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 131, 135, 151.

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

1. **Principles of Biology.** Basic life principles as illustrated in both plant and animal forms. For lower division students except those who may elect Bot. 24, 25 or Zool. 3 and 4. (5; F.)
Staff

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

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

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

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

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

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

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

118. Cytology. A detailed study of the cell with emphasis on structure and behavior of the chromosomes and their bearing on genetics, reproduction, and evolution. Assumes a knowledge of the fundamental principles of botany or zoology. (4; S.) (Not given 1949.) *Boyle*

120. Elementary Plant Physiology. Fundamental principles of absorption, mineral nutrition, food manufacture, metabolism, translocation, and growth. Assumes a knowledge of the fundamental principles of botany. Prerequisites: Chem. 12 or 121. (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. (3; W.) *Wann*

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

131. Principles of Plant Disease Control. Fundamental principles underlying disease control practices for all cultivated crops. Prerequisite: Bot. 130. (4; W.) *Waldee*

135. General Virology. Biological, physical and chemical properties of viruses. Designed to provide a basis for study of virus diseases. Prerequisites: Bot. 130 or Bact. 160. (4; W.) *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. (4; W.) *Waldee*

150. Mycology. Comparative morphology and the nuclear behavior of the fungi. Alternates with 151. Prerequisite: Bot. 130 or Bact. 160. (Not given 1948-49.) (4; F.) *Waldee*

151. Mycology. Biological and biochemical activities of the fungi. Prerequisite: Bot. 130 or Bact. 160. (4; F.) *Waldee*

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

221. Pathological Technique. Special methods as applied to plant pathology, physiology, and related subjects. Registration only by special permission. (4; W.) *Staff*

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

228. Physiogenic Diseases in Plants. Diseases in plants caused by chemical and physical factors in the environment. (3) Alternates with Bot. 229 and 230. *Wann*

229. **Virus Diseases in Plants.** (3) Alternates with Bot. 228 and 230. *Richards*
230. **Bacterial Diseases in Plants.** (3) Alternates with Bot. 228 and 229. *Waldee*
- 234, 235, 236. **Special Problems.** Open to qualified students majoring in pathology, taxonomy, plant physiology, or cytology. (2-4; F. 2-4; W. 2-4; S.) *Staff*
- 240, 241, 242. **Seminar.** (1; F. 1; W. 1; S.) *Staff*
- 250, 251, 252. **Research.** Open to all qualified college students in botany and plant pathology. Any quarter. Time and credit arranged. *Staff*
- Plant Ecology.** (See Range Management 126.)
- Principles of Genetics.** (See Zoology 112.)

Dairy Industry

G. B. CAINE, A. J. MORRIS, *Professors*; G. Q. BATEMAN, *Associate Professor*;
 LYMAN RICH, *Assistant Professor, Extension Dairyman*;
 J. E. PACKER, *Research Assistant*.

Students majoring in Dairy Husbandry must complete the following major courses for graduation: Dairy 1, 5 and 6; An. Hus. 10, 150, 155, and all other courses listed in Dairy Production. Chem. 107 and Bact. 104 are also required.

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

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

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

1. **General Dairy Husbandry.** A short general course in Dairy Husbandry, for students majoring in Dairy Husbandry as well as any students in the School of Agriculture. The following topics are considered: 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, management and housing of dairy cattle. Lab., Judging dairy cattle. (3; F, W. or S.) *Caine*

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

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

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

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.** Study of history and development of all breeds of dairy cattle; special emphasis on the various families within the breeds; requirements for official testing; pedigree and herd book study. (4; F.) *Caine*

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

102. Manufacture of Butter. Receiving and grading of milk and cream. Neutralization and pasteurization of cream. Manufacture, packing, and grading of butter under commercial conditions. Quality and composition control will be emphasized. (5; W.) *Morris*

103. Manufacture of Cheese. Factors involved in the manufacture of cheese of the cheddar and other types. Classification, statistics, curing, marketing, and factory organization. (5; F.) *Morris*

105, 106, 107. 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. (2; F. 2; W. 2; S.) *Morris*

109. Dairy Production. A brief review of the dairy industry. The place of dairying in a permanent system of Agriculture. Origin of breeds, 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. (3; W.) *Caine, Rich*

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 brief study of metabolism and the characteristics of feeds and feeding standards. A thorough study of housing dairy cattle. Prerequisite: Dairy 109. (5; S.) *Caine, Bateman*

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

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

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

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

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

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

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

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

Horticulture

S. W. EDGECOMBE, *Professor*; R. K. GERBER, *Assistant Professor*;
CLARENCE D. ASHTON, *Extension Horticulturist*; ODEAL KIRK,
Superintendent, Ogden Substation.

Students may major or minor in general horticulture or in pomology. The requirements for majors in pomology are: Hort. 1, 8, 101, 111, 112, 115, 102, 110, 151, 153, 154, 155; Landscape architecture 3; Vegetable crops 105; For a major in general horticulture students are also required to have Hort. 6 and 10. Supporting courses recommended for both majors are Ent. 108, 109; Zool. 112; Botany 24, 25, 30, 118, 116, 117, 120, 130, 135; Agron. 107, 109, 115; Ag. Econ. 62, 113, 114; A. E. 10, 14a, 15a, 116; Vegetable crops 130; Landscape architecture 40, 41.

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

The Department of Horticulture offers work toward a Master of Science Degree in General Horticulture and in Pomology.

The following courses in the 100 series may be used for graduate credit: 101, 102, 110, 111, 112, 115, 151, 153, 155, 156.

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

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

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

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

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.)
Edgecombe and Gerber

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

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

151. Systematic Pomology. Systematic study of fruits, origin, classification, identification, judging, adaptation. Alternates with 101. (Not given in 1948-49.) (4; F.)
Edgecombe

153, 154, 155. Seminar. Oral and written reports on research papers and original work by student. (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, 1-3; W, 1-3; S.)
Staff

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

Landscape Architecture and Planning

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

LAVAL S. MORRIS, *Professor*; KENJI SHIOZAWA, *Assistant*.

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 which is functional.

Communities and regions are studied as social and physical organisms. These organisms are analyzed, observed and put together piece by piece. The residential area or subdivision is studied even more intensively than the individual home, lots and their relation to each other are emphasized. The business

and industrial areas, the recreational facilities including parks, circulation and car parking space, airports, cemeteries, civic groups and a great variety of public and private areas are studied in relation to people and their needs.

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

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

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

20. Drawing. A general course in drawing to acquaint students with use of instruments. Necessary to all design courses. Lettering, general drafting, perspective drawing, light and shade studied. (3; F or W.) *Shiozawa*

30. History and Literature of Landscape Architecture. The history of landscape architecture from antiquity to the present time, its relation to architecture and other allied arts. Characteristics of landscape styles in the various countries in relation to present day design. (5; W.) *Morris*

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

60, 61, 62. Architectural Design. The study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. (2; F. 2; W. 2; S.) *Staff*

130. Recreational Planning. Public and private recreation in relation to design, construction and operation. National and state parks and forests studied as they pertain to recreation. Field trip required. (2; S.) *Staff*

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

140, 141, 142. Design. Design of private and public properties based on principles of utility and composition. Prerequisites: L. A. 3, 20; and Civil Eng. 81, 82, 83. (2; F. 2; W. 2; S.) *Morris*

150, 151, 152. Planting Design. Pictorial compositions and planting plans developed together. Designed to develop the student's ability to visualize the finished landscape. (2; F. 2; W. 2; S.) *Morris*

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

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

180, 181, 182. Advanced Planning and Design. Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (3; F. 3; W. 3; 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. (1; W.) *Staff*

210. Advanced Problems in Design and Planning. Time and credit arranged. *Staff*

Poultry Husbandry

BYRON ALDER, *Professor*; C. I. DRAPER, *Associate Professor*;
LAWRENCE MORRIS, *Extension Specialist*.

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

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

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

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

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

10. Poultry Practice. Elementary practice at the poultry yards. Prerequisite, Poul. 1. (S.) *Alder and Draper*

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

102. Poultry Production. Laboratory practice in selection, judging, and other production problems. (1; W.) *Draper*

104. Incubation and Brooding. This course is designed to familiarize the student with the special problems involved in incubation or hatchery operation and the brooding, feeding and rearing of chicks. The advantages and disadvantages of battery, hot water, electric, coal burning, and gas brooders are emphasized. (2; S.) *Staff*

105. Poultry Management. Problems of location of poultry farm, farm planning, renewing the flock, feeding, disease control, marketing, and other problems affecting labor income are studied in detail. Prerequisite: Poultry 1. Poultry 105 and 106 given alternate years. (3; S.) *Staff*

106. Breeds and Breeding. A study of the origin and development of the breeds and varieties of poultry and their adaptability to intermountain conditions; production of hatching eggs for commercial hatcheries; R. O. P. Breeding, and the National Poultry Improvement Plan; and important inheritance problems in poultry. Prerequisites: Poul. 1 or 101, and An. Hus. 15, or Zoo. 112. (3; S.) (Not given in 1948-49.) *Staff*

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

110. Poultry Products. Concerned primarily with the formation, structure, composition, processing, grading, storage, and distribution of poultry and poultry products. Industrial uses and proper care and handling of poultry by-products will also receive some consideration. Two lectures, one Lab. (3; S.) *Staff*

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

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

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

Poultry Disease. (See Veterinary Science 170.)

210. Research Problems in Poultry Nutrition. Time and credit arranged. (2-5) *Staff*

212. Research Problems in Poultry Breeding. Time and credit arranged. (2-5) *Staff*

214. **Research Problems in Poultry Production.** These problems will be in some phase of poultry production other than breeding or nutrition. Time and credit arranged. (2-5.) *Staff*
260. **Animal Industry Seminar, Nutrition.** (1;F.) *Staff*
261. **Animal Industry Seminar, Breeding.** (1;W.) *Staff*
262. **Animal Industry Seminar, Production.** (1; S.) *Staff*

Vegetable Crops

L. H. POLLARD, *Professor*; E. MILTON ANDERSEN, *Associate Professor*; M. P. LEONARD, *Research Assistant*; L. R. HAWTHORN, ALFRED E. CLARK, *Collaborators in Research, U. S. D. A.*

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

Students who plan to do graduate work may be admitted to the technical course in Vegetable Crops by permission of the Department Head and the Dean.

The Vegetable Crops Department offers work toward a Master of Science Degree in Vegetable Crop Production and Vegetable Breeding. The following courses may be used for graduate credit: 120, 121, 160, 161, 162, 163.

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

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

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

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

121. **Advanced Vegetable Crops.** A consideration of the economic, ecological and physiological factors underlying vegetable production, based on a study of experimental results. Prerequisites: Veg. Crops 1, 105; Agron. 56; Bot. 120. This course alternates with 105. (Not given in 1948-49.) (4; W.) *Andersen*

130. **Vegetable and Flower Seed Production.** Methods and commercial possibilities of vegetable and flower seed production in Utah. Field trips taken to seed producing areas. (3; F.) *Staff*

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

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

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

Veterinary Science

WAYNE BINNS, M. L. MINER, *Associate Professors*; H. M. NIELSEN, MAX M. NICHOLS*, HENDRICK VERSLUIS†, *Assistant Professors.*

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

* At Branch Veterinary Laboratory, Provo, Utah.

† On leave.

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

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

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

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

210. **Research.** Outlining and conducting research on animal diseases. Any quarter. Time and credit arranged. *Staff*

PRE-VETERINARY TRAINING

Students desiring to work toward a degree in Veterinary Medicine (D. V. M.) must have at least two years of pre-veterinary training at some authorized college or university. Most students find it necessary to obtain a bachelor of science degree in some related field before they are accepted by a veterinary school. This is highly recommended because it gives the student a well grounded background before starting the technical course. Students majoring in bacteriology, zoology, animal husbandry, dairy industry, poultry husbandry, or pre-medical training as outlined in this catalog with the necessary chemistry and physics will complete all requirements for entrance into a veterinary college. This school does not give a degree in veterinary medicine; therefore, after completing the pre-veterinary work here, the student must continue his training at an institution that offers a degree in veterinary medicine. Students from this institution, to be accepted, must have a thorough training with a good scholastic standing in the basic subjects required in the pre-veterinary course. Enrollment in veterinary schools is limited and students from the state in which the school is located are given preference; therefore, students from this school must be well qualified to be accepted. A suggested three-year pre-veterinary course follows:

Suggested Pre-Veterinary Course

Freshman Year			
	F	W	S
Zoology 3, 4	5	5	
Mathematics 35, 46		5	5
Botany 21, 22	3	3	
Agricultural Economics 53a, 53b		3	3
Sociology 70			5
Animal Husbandry 1	3		
Military Science 1, 2, 3 or P. E.	1	1	1
Electives	5		3
TOTAL	17	17	17
Sophomore Year			
	F	W	S
Chemistry 3, 4, 5	5	5	5
Physics 20, 21, 22	5	5	5
English 10	5		
Animal Husbandry		5	
History 14			5
Military Science 3, 4, 5 or P. E.	1	1	1
Electives	1	1	1
TOTAL	17	17	17

Junior Year

	F	W	S
Chemistry 121, 122, 191	5	5	5
English 110	5		
Speech 1		5	
Animal Husbandry	4	3	
Electives	3	4	12
	<hr/>	<hr/>	<hr/>
TOTAL	17	17	17

Suggested electives are Dairy 1 and 3, Poultry Husbandry 1 and 2, Soils 56, and Bacteriology 1 and 2.

Zoology

Zoology, Entomology, Physiology and Nursing

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

D. M. HAMMOND, G. F. KNOWLTON, C. J. SORENSON, *Profesors*; J. SEDLEY STANFORD, G. H. KELKER, CLYDE BIDDULPH, *Associate Profesors*; WILLIAM SCHOLES, WILLIAM F. SIGLER, *Assistant Profesors*; MERRILL GUNNELL, *Instructor*; FRANK E. TODD, HOWARD E. DORST, F. V. LIEBERMAN, G. E. BOHART, H. F. THORNLEY, GEORGE H. KALOOSTIAN, WALTER E. PEAY, S. J. SNOW, WILLIAM P. NYE, *Collaborators in Research, U. S. D. A.*

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, and parasitology. Frequently, further training and experience in these fields may be obtained by participation in the work of research projects of the Agricultural Experiment Station.

Requirements for a Major in Agricultural Entomology:

Zoology 3	Invertebrate Zoology	102, 103	Systematic Entomology
4	Vertebrate Zoology	108	Agricultural Entomology
112	Principles of Genetics	115	Medical and Veterinary Entomology
106	Zoological Literature		
116	Parasitology		
		125, 126	Seminar
Entomology 13	General Entomology	156	Chemistry of Insecticides and Fungicides
101	Insect Morphology		

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

IN ADDITION to training students to carry on their work in the technical divisions of the Institution, the School of Arts and Sciences offers opportunity to all the students of the College to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never in history been so urgent as now. Such understanding is the surest path to permanent peace in the postwar world. Many of the courses in Arts and Sciences qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of Arts and Sciences also enable properly qualified students to major in its departments and thus begin preparation for a career.

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

SUGGESTED COURSES FOR FILLING GROUP REQUIREMENTS

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

1. Biological Science:

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

2. Exact Science (at least 10 credits):

31. Physical Science (in Chemistry, Geology, Mathematics, or Physics) plus five additional credits in one of the following:
- Chemistry—Any Lower Division course
 - Geology—Any Lower Division course
 - Mathematics—Any Lower Division course
 - Physics—Any Lower Division course

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

- English—Any Lower Division Literature course
- Language—Any beginning course in French, German, Portuguese, Spanish, or Latin.
- Speech—Any Lower Division course

4. Social Science:

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

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

See pages 43 and 44 for general group requirements.

PRE-MEDICAL TRAINING

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

SUGGESTED PRE-MEDICAL SCHEDULE

Freshman Year
(Lower Division)

	F	W	S
Zoology 3, 4	5	5	5
Chem. 3, 4, 5	5	5	5
Math. 34, 35, 44	3	5	3
English 40 or 52	—	—	5
Military Science	1	1	1
Electives	3	1	3
Total	17	17	17

Sophomore Year
(Lower Division)

	F	W	S
German, French or Latin	5	5	5
English 10	—	—	5
Physics 20, 21, 22	5	5	5
Chem. 101, 102	3	3	—
Chem. 17, 18	4	4	—
Electives	2	2	1
Total	17	17	17

Junior Year
(Upper Division)

	F	W	S
Chem. 121, 122	5	5	—
Zoology 118, 119	—	5	4
English 110	—	—	4
Electives	12	7	9
Total	17	17	17

Recommended electives are Medical Latin and Greek (M. L. 80), Psychology, Heredity, College Grammar or Technical Writing, History, Political Science, Sociology and Economics.

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

PRE-DENTAL TRAINING

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

SUGGESTED PRE-DENTAL SCHEDULE

Freshman Year
(Lower Division)

	F	W	S
Chemistry 3, 4, 5	5	5	5
Zoology 3, 4	5	5	—
Mathematics 34, 35*, 44*	3	5	—
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 Year

(Lower Division)

	F	W	S
Chemistry 121, 122	5	5	—
Physics 20*, 21*, 22*,	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	7
Total.....	17	17	17

*A number of the Schools of Dentistry require a minimum of only 9 or 10 credits of physics. Students planning to enter one of these schools may take Physics 6 and 7 instead of Physics 21, 22, and 23, and in this case, Mathematics 35 and 46 may be omitted.

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

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

CADET PRE-NURSING TRAINING

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

Fall Quarter

- 1 and 2 Bacteriology 5 credits M.W.Th.F. 11, T. 2-5
- 1a Introductory Chemistry 5 credits M.W.F. 10, T.Th. 9-12
- 40 Social Psychology 3 credits M.T.Th. 2
- 4 Physiology 5 credits daily 9

Winter Quarter

- 5 Nutrition 3 credits M.W.F. 9
- 30 Psychology for Nurses 3 credits M.W.F. 11
- 10 English 5 credits daily 10
- 10 Human Anatomy 5 credits daily 8

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

B. S. DEGREE FOR NURSES

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

Bacteriology and Public Health

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

J. E. GREAVES, *Professor Emeritus*; W. W. SMITH (*Chairman*), W. B. PRESTON, *Professors*; K. R. STEVENS, *Associate Professor*; L. W. JONES, W. R. SCHOLES, *Assistant Professors*; ANN BURNS, D. W. WILL, *Instructors*.

BACHELOR OF SCIENCE DEGREES IN BACTERIOLOGY AND PUBLIC HEALTH

See pages 43 and 44 for courses that may satisfy group requirements.

Students majoring in General Bacteriology should take: Bacteriology: 1 or 70, 2 or 71, 104 plus 105 or 120, 110 or 170, 160, 180, 191, 192, 193; Chemistry: 190 or 191 plus prerequisites; Mathematics: 35, 44; Physics: 21, 22 (6 and 7 will be accepted in special cases); Public Health: 50; Zoology: 3, 4.

Students majoring in Clinical (Medical) Technology should take: Bacteriology: 1 or 70, 2 or 71, 107, 130, 131, 132, 160, 162, 164, 166, 167; Chemistry: 10, 11, 12, 190, 192; Physiology: 4, 10; Physics: 6, 7; Public Health: 50; Zoology: 3, 4, 116, 117.

Students majoring in Public Health should consult Professors Smith or Scholes. This degree must be followed by graduate studies in Public Health for those who seek employment in Public Health Fields.

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

MASTER OF SCIENCE DEGREE IN BACTERIOLOGY

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

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

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

Courses numbered over 200 are largely restricted to graduate students.

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

Botany and Plant Pathology

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

B. L. RICHARDS, F. B. WANN, *Professors*; E. L. WALDEE, *Associate Professor*; GEORGE W. COCHRAN, *Associate Research Professor*; W. S. BBOYLE, *Assistant Professor*; ARTHUR H. HOLMGREN, *Assistant Professor and Curator of the Inter-mountain Herbarium*; R. A. BUSH, *Instructor*; BASSETT MAGUIRE, *Curator New York Botanical Garden, Non-Resident Professor*; H. L. BLOOD, BRYCE N. WADLEY AND GEORGE KALOOSTIAN, *Collaborators, U. S. Department of Agriculture*.

BACHELOR OF SCIENCE DEGREE IN BOTANY

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

Course requirement for a teaching major: 21, 22, 23, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology, 121, 131, 135, 140, 151; Taxonomy, 104, 108, 112; Physiology, 121, 224, 228; Cytology, 118.

See pages 43 and 44 for courses that may satisfy group requirements.

MASTER OF SCIENCE DEGREE IN BOTANY

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

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

The following courses in the 100 series may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 131, 135, 150, 151.

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

Chemistry

REUBEN L. HILL, SHERWIN MAESER, DELBERT GREENWOOD, *Professors*; MELVIN C. CANNON, THEODORE M. BURTON, *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 in addition to fulfilling the group requirements of the College as given on pages 43-44 of this catalog. To aid the student in registering the following suggested schedule is given.

Suggested Schedule

Freshmen

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

	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
	<hr/> 16	<hr/> 16	<hr/> 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	5	5	5
Group requirements in biological and/or social sciences	5	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
	<hr/> 16	<hr/> 16	<hr/> 16

Sophomores

A. For students with mathematics:

	F	W	S
Math. 98, 99	5	5	—
English 10 or 11	—	—	5
Physics 20, 21, 22	5	5	5
Chemistry 17, 18, 19	4	4	3
Lower Division requirements	3	3	4
Physical Education or Military Science and Tactics	1	1	1
	<hr/> 18	<hr/> 18	<hr/> 18

NOTE: Five credits lower division group requirements must be completed in junior year.

B. For students with incomplete mathematics:

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
	<hr/>	<hr/>	<hr/>
	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 lit.	5	5	10
	<hr/>	<hr/>	<hr/>
	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
	<hr/>	<hr/>	<hr/>
	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. In addition to the graduate courses (in the 200 series) courses 116, 135, 155, 191 may be used towards the Master's Degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's Degree by other departments if the committee chairman approves.

Before admission to candidacy for the Degree all graduate students will be required to pass the National Cooperative Test Examinations of the American Council of Education for undergraduate training in General Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry.

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

3, 4, 5. Chemical Principles and Qualitative Analysis. An Introduction to chemical theory and the principles of chemistry including introductory qualitative analysis in the spring quarter. Prerequisites: high school chemistry or physics, algebra and geometry. This course is designed for science majors, pre-medical and pre-dental students and home economics majors in foods and nutrition. Three lectures, two labs. (5; F. 5; W. 5; S.) *Maeser*

10, 11, 12. General Chemistry. An introduction to the fundamental principles of inorganic and organic chemistry. A one-year terminal course open to any matriculated student. Students with a grade of B or better may enter Chemistry 5 in the spring quarter. (5; F. 5; W. 5; S.) *Staff*

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

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

31. Physical Science. Principles essential to understanding of physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. (5; F.)

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. (3; F. 3; W. 3; S.) *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. (4; W. 4; S.) *Hill*

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

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

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

123. Organic Chemistry. A continuation of Chemistry 122 covering more advanced theories and reactions. Prerequisite: Chem. 122. (5; S.) *Burton*

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

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

133 or 233. Colloidal Chemistry. Laboratory. Accompanies Course 132. Time and credit arranged. (To be offered 1949-50.) *Staff*

134 or 234. Qualitative Organic Analysis. The classification reactions and laboratory work involved in identification of unknown organic compounds. Prerequisites: Chem. 19 and 123. (3; S.) (To be offered 1949-50.) *Burton*

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

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

150 or 250. Advanced Inorganic Chemistry. Based on the periodic table and atomic structure. Designed for Chemistry seniors and graduates and others with similar training. (3; W.) (To be offered 1948-49.) *Staff*

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

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

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

170, 270. Chemical Microscopy. Lecture and laboratory practice in the use of the microscope and its accessories as applied to chemistry. Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and analysis of minute amounts of material. Prerequisite: Physical Chem. or special permission. (2 or more; W.) (To be offered 1948-49.) *Cannon*

171, 271. Quantitative Micro-Analysis. Laboratory practice and lecture in the use of the micro-chemical balance, micro-analysis of carbon, hydrogen, halogens, sulfur, phosphorus, Kjeldahl and Dumas nitrogen, micro molecular weight determination. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (2 or more; S.) (To be offered 1949-50.) *Cannon*

172, 272. **Optical Methods of Chemical Analysis.** Lecture and laboratory problems in spectroscopy, spectrophotometry, colorimetry, refractometry and microscopy. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3; F.) (To be offered 1948-49.) *Cannon*

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

174, 274. **Advanced Quantitative Analysis.** An advanced course illustrating the techniques and practices in the analysis of complex substances, such as rocks, minerals, gases, water supplies, etc. Prerequisite: Chemistry 19 or 119. Spring. Time and credit to be arranged. (To be offered 1948-49.) *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. (5; F.) *Staff*

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

192 or 292. **Biochemistry.** Problems of 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. (3; F.) *Greenwood*

193 or 293. **Biochemistry.** Preparations of enzymes or amino acids as arranged. Prerequisite: Chem. 109 or 191. Two credits. Any quarter. Time arranged. *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. (3; F.) *Greenwood*

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

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

197 or 297. **Advanced Biochemistry.** Vitamins and hormones and their function in plants and animals. Prerequisite: Chem. 190 or 191. (2; S.) *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. Outstanding seniors may register by special permission. Course includes modern theories and special topics in organic chemistry. Prerequisites: Chem. 123, 106. (2; F. 2; W. 2; S.) (To be offered 1949-50.) *Burton*

English

N. ALVIN PEDERSEN, ALMA N. SORENSEN, *Professors Emeritus*; WALLACE J. VICKERS, *Chairman*, KING HENDRICKS, CARLTON CULMSEE, *Professors*; IRA N. HAYWARD, HUBERT W. SMITH, *Associate Professors*; MOYLE Q. RICE, ALICE SENOB *Assistant Professors*; STANLEY P. ANDERSEN, PEARL S. BUDGE, WILLARD HEED, *Instructors*; WILLIS N. ROSENTHAL, *Special Instructor*.

See pages 43 and 44 for courses which may satisfy group requirements.

English Major Requirements

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

*On leave.

English 105, 118, 119, 162, 196, two period courses (161, 175, 180, 190, 191), one additional literature course numbered above 120, and at least 21 credits of a foreign language are required of majors in English. Of these 21 credits, 18 may be used as a minor. English 123, *The Teaching of English*, is recommended for English majors and teaching majors in English. Students must also maintain a "B" grade average in their major subjects. **Teaching majors in English meet the same requirements except foreign language.**

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

A. Drill in Essentials of English. To assist students with English deficiencies. Students whose standings in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10. No credit. (F, W or S.) *Nuhn and Lindholm*

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. No credit. (F, W or S.) *Smith*

C. English for Foreign Students. A continuation of English B; required of students who have completed English B. and who in the judgment of the instructor require further special training in the language. Other foreign students may take the course as an elective. No credit. (W or S.) *Smith*

1. College Grammar. (5; F or W.) *Vickers*

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

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

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

11. Sophomore Composition. Should be taken in place of English 10 by sophomores whose record in the placement test indicates special aptitude in composition. Open only to students whose placement cards are marked "Eligible for English 11." (5; F, W or S.) *Andersen, Nielsen and Rice*

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

20. Masterpieces of Prose. Fiction, essay, biography. (5; S.) *Senob*

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

22. Contemporary American Poetry. The principal American poets since 1900. The purpose is to help students enjoy and understand poetry as a living art. (3; W.) *Nielsen*

23. Contemporary British Poetry. (3; S.) *Hayward*

24. **Children's Literature.** Introduction to the prose and poetry of childhood and adolescence. Helpful to teachers and parents. (4; F, W or S.) *Pedersen*
25. **The Nineteenth Century Novel.** Analysis of the novels of Scott, Austen, Thackeray, Cooper, and Hawthorne. (3; F.) *Staff*
26. **The Nineteenth Century Novel.** Analysis of the novels of Dickens, Balzac, Bronte, and Butler. (3; W.) *Staff*
27. **The Nineteenth Century Novel.** Analysis of the novels of Hardy, Meredith, Howells, Janems and Turgenev. (3; S.) *Staff*
31. **Floating Poetry.** The poetry that has lived in the oral tradition since medieval times. The course is divided into four parts: the narrative ballad, the non-narrative poem, Negro poetry (including slave songs and spirituals), and children's poetry. (3) *Hendricks*
33. **Contemporary Short Story.** The technique of the short story. English, American, and European stories are analyzed. Encouragement is given to those who wish to write. (3; F or S.) *Rice*
34. **Nineteenth Century Short Story.** (3; W.) *Rice*
37. **The Essay.** Writers of the present—American and English. (3; W.) *Rice*
40. **World Literature.** A survey course including a study of epic and romance, tragedy, comedy, satire, etc., as these forms have appeared in Greek, Roman, Hebrew, Italian, French, German, English and American literature. (5; F, W or S.) *Sorensen*
43. **Scandinavian Literature (In Translation).** Selected readings from recent and traditional writers: short stories, novels, poetry. (3; S.) *M. L. Nielsen*
46. **The Bible as English Literature.** Provides an opportunity for first hand acquaintance with the great book of books. (5; S.) *Vickers*
47. **Readings in Greek Literature.** Provides an opportunity to become acquainted with Greek epics and dramas. (5; F.) *Vickers*
48. **Readings in Drama.** Selected masterpieces of Continental, British, and American drama from the Renaissance to the present. Emphasis is placed upon the theatre as the medium of a popular art form, reflecting cultural and social ideas of its time. (5; W.) *Hayward*
52. **American Literature.** Survey of American prose and poetry from the Colonial period to the present. (5; W or S.) *Culmsee and Hayward*
53. **American Literature.** Survey of American literature from the beginnings to the present, with emphasis on works expressing the democratic spirit or in other ways portraying ideas characteristic of American culture. Open to English majors or minors and to majors and minors in other departments by permission of the instructor. (5; F.) *Hayward*
54. **American Biography and Autobiography.** To introduce American biography and autobiography as an enjoyable and important form of literature and as a source of valuable sidelights on American thought and culture. (2; F.) *Hayward*
55. **American Novel.** Writings of principal American novelists from Charles Brockden Brown to present. Emphasis on the novel as a form of art portraying and interpreting the American scene, past and present. (3; W.) *Hayward*
56. **American Drama.** The development of American drama from Revolutionary times to the present. The principal American plays are studied in the light of literary and social theories of the times in which they were written. (3; W.) *Hayward*
60. **English Literature.** A survey of the principal masterpieces of English literature from Beowulf to William Blake. (5; W.) *Rice*
61. **English Literature.** A survey of English masterpieces of the period from Wordsworth to the twentieth century. (5; S.) *Rice*
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. (3; F.) *Pedersen*
83. **Wordsworth.** (3; W.) *Senob*
85. **Shelley.** His relation to the Romantic movement. (2.) *Sorensen*

88. **Browning.** Chiefly a study of his monologues and selected dramas. (2; S.) *Andersen*
95. **Contemporary Novels.** Reading and interpretation of the best twentieth century novels *Andersen*
105. **History of the English Language.** The evolution of the English language from Anglo-Saxon times to present. (3; W.) *Hendricks*
110. **Advanced Composition.** Required of Upper Division students. Emphasizes correctness, vocabulary, selection and clear organization of material. (4; F, W or S.) *Staff*
111. **Technical Writing.** Emphasis upon bibliography, research methods, and final form of the technical report. (4; F, W or S.) *Hendricks*
- 117 a, b, c. **Writer's Workshop.** For students who desire special assistance in imaginative writing. Admission is granted to all who show a particular talent in the writing of prose or verse, but prospective students are required to consult the instructor before registering. (2; F. 2; W. 2; S.) *Culmsee*
- 118, 119. **Creative Writing.** Short stories, essays, poetry. Considerable freedom of choice as to type. To register for Winter quarter exclusive of Fall quarter, consult instructor. (3; F. 3; W.) *Pedersen*
123. (Education 123.) **The Teaching of English.** A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study both materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. Satisfies part of education requirement for teachers' certificate. (3; S.) *Hayward*
134. **Literary Criticism.** Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4; W.) *Senob*
135. **Modern Literary Criticism.** Critical essays since Croce, with particular attention to T. S. Eliot and the modern American School. (4; S.) *Culmsee*
143. **Soviet Literature in Translation.** Literature produced in Soviet Russia between 1918 and the present. Special emphasis on works of Gorki, A. Tolstoi, Ehrenburg and Sholokov. (5) *Hendricks*
147. **Comparative Literature.** A comparative study of the literature of the 18th century of France and England. (4; F.) *Hendricks*
148. **Comparative Literature.** A comparative study of the Romantic period in England and Germany. (4.) *Hendricks*
149. **Comparative Literature.** A study of the 19th Century in England, France and Russia. (4; S.) *Hendricks*
157. **Poe and Whitman.** Poetry and prose. Poe is studied as a pioneer artist and critic in poetry and the short story; Whitman as exponent and champion of American democracy. (3; S.) *Hayward*
158. **Hawthorne and Melvill.** Essays, tales and novels. Emphasis upon political, social, and philosophical ideas. (3) *Hayward*
159. **Emerson and Thoreau.** Essays, lectures, and poetry of the two principal figures of the Concord Group as representatives of the literature and thought of their time and as thinkers whose ideas are still important. (3; S.) *Hayward*
161. **Medieval Literature.** English literature from Beowulf to the Renaissance, exclusive of Chaucer. Emphasis on the epic and the metrical romance. Some continental literature included. Reading in translation. (5) *Vickers*
162. **Chaucer.** Relation of Chaucer to his time; his influence upon subsequent literature. Emphasis upon oral reading. (5; W.) *Pedersen*
163. **Shakespeare.** Six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. (5; S.) *Pedersen*
164. **Elizabethan Playwrights, Exclusive of Shakespeare.** Plays selected from Marlowe, Dekker, Jonson, and others. (3; F.) *Senob*

167. **Arthurian Legends.** The legends and their relation to English Literature. (3; S.) *Nielsen*
170. **Milton.** Selected prose and poetry with emphasis on *Paradise Lost*. (5; W.) *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 1660 to 1798. (5) *Staff*
185. **Eighteenth Century Novels.** Examines a limited and selected number of works, with particular attention paid to *Tom Jones* and *Tristram Shandy*. (2) *Staff*
186. **Restoration Drama.** Principal plays of the Restoration, 1660-1706. (2; W.) *Senob*
190. **Romantic Period.** A brief study of the precursors of romanticism; a study of the literature from 1790-1832, 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. (5; F.) *Smith*
193. **Arnold.** (2; F.) *Senob*
195. **Readings and Conference.** Time and credit arranged. Any quarter. Limited to English majors. *Staff*
196. **Methods and Materials for English Study.** Intended to introduce English majors to approved methods of advanced study in English. Major emphasis is on use of library, compilation of bibliographies, and writing of course papers. Required of all English majors in the junior year. (3; F.) *Hayward*

JOURNALISM

Major students in Journalism should complete Journalism 12, 13, 14, 16, 110, 112, 113 or 156, 114, 115, 120; English 1, 5, 10, 52, 110, 117 or 118 or 119.

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

4. **Exploring Journalism.** An introductory course with discussions of opportunities in journalistic vocations and qualifications for success in these fields. Practice in various types of writing is given to enable students to estimate aptitudes and interests. (2; F.)

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

13. **Newspaper Reporting.** A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12. (3; W.)

14. **Advanced Reporting.** A continuation of 13. Lectures, class practice and experience. Prerequisites: 12 and 13. (3; S.)

15. **Editorial Page.** A study of editorials and other elements of the modern editorial page, and the writing of editorials. (2; F.)

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

81. **Radio Speech.** (See Speech Department for description.) (3; F or S.)

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

113. **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. (3; W.)

114. Writing for Radio. Study and practice in writing information and interpretative continuity for radio programs. (3; S.)

115. Law of the Press. Law of libel, right of privacy, contempt of court, freedom of the press, copyright, and postal regulations. (2; S.)

116. History of Journalism. American newspaper men and their contributions to journalism; also modern newspaper trends. (5; S.)

120. Agricultural Journalism. Problems of writing for, editing, and publishing weekly newspapers and magazines. Emphasis on writing farm and home news. Intended to aid agricultural extension workers and others in preparing material for rural publications. (3; S.)

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

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

151. Photographic Problems. (See Commercial Photography Department for description.) (3; F, W or S.)

156. Principles of Advertising. (See Merchandising Department, School of Commerce, for description.) (5; W.)

Geology

J. STEWART WILLIAMS, *Professor*;, *Associate Professor*.

Geology Club: The Geology Club, an organization of geology students under the supervision of the Geology Department meets in the lecture room of the Department at 8:00 p. m. on the second Thursday of each month. The programs consist of talks by guests, faculty members, and students. All interested persons are invited to attend. Regular attendance is required of all geology majors.

Major in Geology: The following courses, or their equivalents, outside the Department of Geology, are required of Geology majors: Chem. 3, 4, and 5; C. E. 81, 82, and 83; English 110 and 111; Physics 20, 21, and 22; Math. 34, 35, and 46. The following courses in the department, are required of majors: 1 or 3, and 2; 101, 102, 106, 108, 110, 112 or 113, 114, 115, and 120.

Field Trips: Since field work is a very essential part of the study of Geology, majors should be prepared to devote most of the Saturdays during the Fall and Spring quarters to this work. Two longer field trips, each of several days' duration, are taken each year, one in the Fall quarter and one in the Spring quarter. Majors should plan to take as many of these trips as possible, and attendance on the majority of the trips is required for a major.

MASTER OF SCIENCE DEGREE IN GEOLOGY

The Geology Department offers work toward the Master of Science degree in the fields of invertebrate paleontology, stratigraphy, areal geology and ground water geology. The following courses in the 100 series may be used for graduate credit by students majoring in the department of Geology: 102, 103, 107, 112, 113, 116, 117.

Any or all courses in the 100 series may be used for graduate credit by students in other departments.

1. Introductory Physical Geology. A general survey of physical geology for art students and others who desire only a broad introduction to the subject. This course is continued in Geology 2, for which it is a prerequisite. Closed to students who have had Geology 3, or equivalent. A one-day field trip is required in Fall and Spring quarters. (5; F, W or S.)

2. Introductory Historical Geology. A continuation of Geology 1 covering historical geology. Prerequisite: Geol. 1. (5; W.) *Williams*

3. Physical Geology. Designed for forestry, engineering, and soils students and others who desire a substantial introduction to physical geology. Not open to students who have taken Geology 1 or equivalent. A five dollar deposit is required for loss and breakage of equipment. A one-day field trip required. (5; F, W or S.) *Williams*

31. Physical Science. Principles essential to understanding of physical universe. Elements of basic physical sciences integrated for use in interpreting human experience. (5; F.)

101. Mineralogy. Identification of the common minerals by means of physical and chemical tests. Elementary crystallography. Prerequisites: Geol. 3 and Chem. 3, 4, and 5, or equivalents. (5; F.)

102. Opical Mineralogy and Petrography. Optical properties of the common rock-forming minerals, and identification of these minerals in thin-sections and in refractive-index media with the petrographic microscope. Introduction to the classification of rocks, and correlation with the field classification. Prerequisites: Geol. 101 and Physics 22. (5; W.)

103. Engineering Geology. The application of geology to engineering problems. For seniors in Engineering. (3; S.)

104. Regional Geology of the United States. Major geologic structures and land forms of the physiographic provinces of the United States that have influenced exploration, settlement, and industrial development. Prerequisite: Geol. 1 or 3, or equivalent. (2½; Summer.) *Staff*

106. Invertebrate Paleontology. Introduction to the study of fossils. A living example of each of the groups of animals with important fossil representatives is used as an introduction to the fossil forms of that group. Methods of preparation and study are developed from work upon material collected by the student himself. Prerequisite: Geol. 2 and Zool. 3. (5; W.) *Williams*

107. Igneous Petrography. Identification and classification of the igneous rocks by study of thin-sections with the petrographic microscope. Prerequisite: Geol. 102. (3; S.)

108. Stratigraphy. Introduction to the processes by which the sedimentary rocks have been formed, and to their original structures, followed by a study of the stratigraphic systems and their identification by guide fossils. Field trips required. Prerequisites: Geol. 3 and Geol. 106. (5; S.) *Williams*

110. Structural Geology. Types and origin of rock structures, and their role in the formation of mineral veins, petroleum and natural gas fields, and the general architecture of the Earth. Prerequisite: Geol. 3 or equivalent. (5; W.)

112. Economic Geology Nonmetals. Geologic occurrence and distribution of petroleum, natural gas, coal, building materials, and other non-metallic resources. Prerequisite: Geol. 101 and 110. (5; W.)

113. Economic Geology Metals. Geologic occurrence and distribution of metalliferous deposits of the world. Prerequisite: Geol. 101 and 110. (5; F.)

114. Field Methods. Field practice in measurement of attitude and thickness of formations, field use of topographic maps, and note taking. Mapping by pacing and compass, and plane table. Prerequisites: Geol. 3, C. E. 81 and 82. (5; S.) *Williams*

115. Advanced Physical Geology. Phases of geology of particular interest to students of conservation in the Western States. Processes of erosion, action and development of streams, land forms, subsurface water, etc. Prerequisites: Geol. 3 and College Mathematics, Chemistry and Physics. (5; F.) *Williams*

16 or 116. Special Problems. Direction in the study of special problems in which a student has become interested, and upon which he desires to make written reports. From one to six credits, not to exceed two in any quarter. Time arranged. *Williams*

117. Ground Water Geology. Geologic conditions that control the occurrence and purity of ground water, with special reference to western United States. Prerequisite: Geol. 3 or equivalent. (2; S.)

120 or 220. Thesis. Upper division or graduate thesis. A thesis on some field problem is required of majors and five credits are given for its completion. Registration for undergraduate thesis is limited to Fall or Spring quarter. It must be for five hours and thesis must be completed in one quarter.

Registration for the graduate thesis may be for one, two or three quarters and nine to fifteen credits are given for its completion. *Williams*

230. Graduate Seminar. Time arranged. (2-5; F, W or S.) *Williams*

History

JOEL E. RICKS, JOHN DUNCAN BRITE, *Professors.*

See pages 43 and 44 for courses which may satisfy group requirements.

Students majoring in History should complete the following classes: History 1, 2, 13, 14, 105, 106, 124, 126, 135, 171A, 175, 190. Students majoring should consult the head of the department for registration.

History majors intending to pursue graduate work should complete two years of French or German.

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

2. Modern European History. A survey of the early and recent periods of modern European history from the seventeenth century to the Second World War. (5; S.) *Brite*

4. World Civilizations. A survey of the civilizations of the world from earliest times to the sixteenth century. Attention is given the life, principal contributions, and significance of past civilizations. (5; F, W or S.) *Ricks and Brite*

8. Recent European History. From the Treaty of Versailles in 1919 to the present time, emphasizing the problems following the last war and the underlying causes of World War II. (3; F, W or S.) *Ricks and Brite*

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

21. Hispanic American History. A brief survey of the beginnings and colonial development of Spanish and Portuguese America is followed by a more detailed study of the revolutions, establishment of republics, culture and international relations of the Hispanic American nations, and includes the Monroe Doctrine and Pan-American proposals. (5; W.) *Ricks*

22. The Pacific Area and Asia. Emphasizes modern problems of the Pacific areas and Asia. Includes also a brief survey of the cultures and history of these peoples as well as a more intensive study of their movements and aspirations. The background and nature of the Second World War in the Pacific and Asia is included. (2; S.) *Ricks*

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

105. Greek History. The civilization of the Hellenic peoples from their beginnings in the days of Aegean civilization to the spread of Greek culture throughout the Mediterranean world by Alexander the Great. (4; S.) *Brite*

106. Roman History. From the beginnings of the Roman Republic to the decline and fall of the Empire in the fifth century A. D. (3) *Brite*

124. European History. The Renaissance, the Protestant Revolution and the Catholic Reformation from the thirteenth to the seventeenth century. (5; F.) *Brite*

126. European History. The French Revolution and Napoleon, 1789-1815. (3; W.) *Brite*

135 or 235. United States History. History of the Far West. This course will deal with the region from the Rockies to the Pacific Coast with special emphasis upon the Intermountain West. (5; S.) *Ricks*

171A. United States History. Constitutional History of the United States to present. (3; W.) *Ricks*

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

190 or 290. Historical Research. (2; W.) *Ricks*

Landscape Architecture and Planning

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

LAVAL S. MORRIS, *Professor*; KENJI SHIOZAWA, *Assistant*.

- 3. Elements of Landscape Architecture and Planning.
- 20. Drawing.
- 30. History and Literature of Landscape Architecture.
- 40, 41. Plant Materials.
- 60, 61, 62. Architectural Design.
- 130. Recreational Planning.
- 140, 141, 142. Design.
- 150, 151, 152. Planting Design.
- 160, 161, 162. Landscape Construction.
- 170. Civic Planning.
- 180, 181, 182. Advanced Planning and Design.
- 190. Special Problems.
- 195. Seminar.
- 210. Advanced Problems.

See Landscape Architecture in School of Agriculture for course descriptions.

Mathematics

V. H. TINGEY, *Professor*; RALPH L. CALVERT, NEVILLE C. HUNSAKER, *Associate Professors*; MARY NELSON, JOE ELICH, *Assistant Professors*.

See pages 43 and 44 for courses which may satisfy group requirements.

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

Regular Major: Mathematics 60, 97, 98, 99, 100, 118, 119, 120, 121, 122, 123, 130, 131, 152, 153. Students who have had the equivalent of any of the above will not be required to take that particular course. Physics 20, 21, 22, and nine credits additional in either Physics or Chemistry of senior college grade are required. Chemistry 3, 4, and 5 are required. A reading knowledge of French and German is strongly recommended.

Teaching Major: Students expecting to teach mathematics in high schools must meet the state requirement for certification. Teaching majors must take the following courses or their equivalent: Mathematics 33, 34, 35, 44, 46, 97, 98, 99, 100, 111, 118, 119, 120, 121, 122, 123, 131, 153; also Physics 20, 21, 22; Chemistry 3, 4, 5; and nine additional credits of Physics and Chemistry of upper division grade.

One year of high school algebra and one year of high school plane geometry are prerequisite to all college mathematics.

- 31. Physical Science. Essentials for an understanding of physical universi. (5; F.)
- 33. Solid Geometry. (2; F, W or S.)
- 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. (3; F, W or S.)
- 35. College Algebra. Prerequisite: 34. (5; F, W or S.)
- 44. Plane Trigonometry. Prerequisite: 35. (3; F, W or S.)
- 46. Plane and Spherical Trigonometry. Prerequisite: 35. (5; F, W or S.)
- *50. Descriptive Astronomy. (3; S.)
- 60. Mathematics of Finance and Life Insurance. Prerequisite: 35. (3; W.)
- 97. Plane and Solid Analytical Geometry. Prerequisite: 35 and 44. (5; F, W or S.)

NOTE: All * subjects will not be given 1948-49.

98. Differential Calculus. Prerequisite: 97. (5; F, W or S.)
 99. Integral Calculus. Prerequisite: 98. (5; F, W or S.)
 100. Calculus. Prerequisite: 99. (3; S.)
 111. Statistics. Prerequisite: 35. Not open to lower division students. (5; F or W.)
 *118. Modern Algebra. Prerequisite: 99. (3; W.)
 *119. Theory of Equations. Prerequisite: 99. (3; W.)
 *120. Modern Geometry. Prerequisite 97. (3; W.)
 *121. Projective Geometry. Prerequisite: 99. (3; S.)
 122. Ordinary Differential Equations. Prerequisite: 99. (3; F or S.)
 123. Number Theory. Prerequisite: 99. (3; S.)
 130. Advanced Calculus. Prerequisite: 100. (3; F.)
 131. Advanced Calculus. Prerequisite: 130. (3; W.)
 152. Partial Differential Equations. Prerequisite: 131. (3; S.)
 153. Mathematical Readings. Prerequisite: 123. (3; S.)
 254. Theory of Functions. Prerequisite: 131. (3; F.)
 255. Theory of Functions. Prerequisite: 254. (3; W.)
 256. Theory of Functions. Prerequisite: 255. (3; S.)

NOTE: All * subjects will not be given 1948-49.

Military Science and Tactics

GROUND AND AIR

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T*; LT. COL. JAMES C. BRADFORD, *QMC*; LT. COL. HAROLD E. COTTER, *AC*; MAJOR ALFRED B. BANKS, *FA*; MAJOR HAROLD D. HIGGINS, *CAC*; MAJOR JOSEPH R. MEACHAM, *CAC*; MAJOR FLOYD E. ROTH, *AC*; CAPTAIN RALPH L. GIDDINGS, JR., *FA*; CAPTAIN JOSEPH W. LYONS, *QMC*; CAPTAIN ALLEN G. MCCLURE, *AC*; CAPTAIN WILBUR J. SCHINDLER, *AC*; *Assistant Professors* M/SGT. FRANCIS ALIX, *DEML*; M/SGT. CHARLES D. HENDRICKS, *DEML*; M/SGT. JOHN L. HOLLAND, *DEML*; M/SGT. FREDERICK V. MCWOLD, *DEML*; 1ST SGT. MARVIN L. BRIMMER, *DEML*; 1ST SGT. WALTER B. SPEED, *DEML*; T/SGT. JOSEPH C. HUGHES, *DEML*; T/SGT. VAL M. JOHNER, *DEML*; T/SGT. CHARLES J. LEFLEY, *DEML*; T/SGT. I'LONE L. NORMAN, *DEML*; T/SGT. PAUL H. WESSMAN, *DEML*; S/SGT. JACK E. HOWARD, *DEML*, *Instructors*; PROFESSOR N. W. CHRISTIANSEN, *Band Instructor*.

For students who wish to qualify for a Regular Army commission, a department major in Military Science and Tactics is offered through the School of Arts and Sciences. In the post-war period the colleges and universities of the nation will be called upon to supply the majority of the officer personnel needed for the Regular Army and Marine Corps.

Students majoring in Military Science and Tactics must complete the following requirements: M. S. and T., 36 credits; Mathematics 34, 35, 46, 97, min. 30 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits; History 17 and 21, 10 credits.

REGULAR ARMY COMMISSIONS

Under authority granted in AR 145-10, the PMS&T is authorized to appoint as "Honor Graduates" such graduating students as are deemed worthy of commendation by both the President of the College and the PMS&T.

Under the provisions of War Department Circular 101, 1947, students designated as "Honor Graduates" are authorized to apply for direct commissions in the Regular Army of the United States. Approximately ten such commissions will be available to students of this College each year.

Under the provisions of War Department Circular 210, 1947, students who receive reserve commissions are authorized to apply for a "Competitive Tour"

of active duty to last for a period of two years. From each group of reserve officers who enter on these "Competitive Tours" a certain number are given commissions in the Regular Army of the United States. It is estimated that approximately fifteen hundred such commissions will be awarded annually, throughout the nation.

Two years of military training (six credits) are required of all qualified male students at the College. Students are normally required to complete the basic course during the first and second years at the Institution.

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

Modern Languages and Latin

GEORGE A. MEYER, *Professor*; GEORGE C. JENSEN, *Professor Emeritus*; THELMA FOGELBERG, MARION L. NIELSEN, *Associate Professors*; ALDYTH THAIN, *Assistant Professor*; JESSE G. NELSON, *Instructor.*

Intensive elementary language courses are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in a shorter space of time than required for the standard elementary courses. One hour daily is used for lecture and one hour for drill in oral-aural training. The equivalent of the standard first year of modern language is completed in two quarters. Special courses for advanced work are provided for those who have satisfactorily completed the intensive two quarters course.

Standard 5 credit elementary courses are provided for those whose aim is primarily a reading knowledge of a foreign language and the satisfying of language requirements.

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

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

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

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

FRENCH

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

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

101A. Intermediate French. Intensive Course. (5; S.)

Meyer

101. Int. French. (5; F.)

Meyer

102. Intermediate French. (5; W.)

Thain

105. Advanced Composition and Conversation. (3; W.)

Fogelberg

106, 107, 108. Selective Readings. Open to students who have completed French 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2; F. 1-2; W. 1-2; S.)

Staff

109. French Short Story. A study of the French Conte as a literary form from the earliest times. The course serves as an introduction to literary movements in France. Special emphasis on the 19th century. (3; S.)

Meyer

110. French Phonetics. Principles of French pronunciation and their practical application. (3; F.)

Meyer

112. French Poetry. (5; W.)

Thain

120. The Comedies of Moliere. Moliere's plays as social criticism. (2; F.)

Meyer

121. French Classic Drama. Plays of Corneille and Racine. (2; W.)

Staff

122. Nineteenth Century French Drama. The Romantic and Realistic Schools. (2; S.)

Fogelberg

129, 130. French Literature of the 18th Century. Special emphasis on the philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. (2; F. 2; W.)
Meyer

131. The Comedies of Beaumarchais and Marivaux. (2; S.) *Staff*
135, 136, 137. Nineteenth Century French Novel. (2; F. 2; W. 2; S.)
Fogelberg

GERMAN

1A, 2A. Elementary German. Intensive Course. Two hours daily. (7; F. 7; W.) *Jensen*

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

101A. Intermediate German. Intensive. (5; S.) *Staff*

101. Intermediate German. (5; F.) *Staff*

102. Intermediate German. (5; W.) *Nielsen*

105. Advanced Composition and Conversation. (3; W.) *Staff*

106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2; F. 1-2; W. 1-2; S.) *Staff*

110, 111, 112. Scientific German. Reading of scientific texts. Reports. (2; F. 2; W. 2; S.) *Nelson*

120. Die deutsche Novelle im 19. Jahrhundert. Reading and discussion of representative stories by Hauff, Storm, Heyse, Meyer, Keller and others. (3; F.) *Staff*

121. Lessing—Plays and Biography. (2) *Staff*

122. Schiller—Poetry, Plays and Biography. (2; S.) *Staff*

123. Die deutsche Novelle im 20. Jahrhundert. Representative stories by Thomas Mann, Heinrich Mann, Herman Hesse, Schnitzler and others. (2) *Staff*

130. Goethe's Faust. Prerequisite: Two years of college German or equivalent. (3; W.) *Staff*

131. Goethe's Prose. Werther, Dichtung and Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3; S.) *Staff*

132. Heine's Poetry and Prose. (3; F.) *Staff*

133. German Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) *Staff*

150. Schnitzler's Stories and Plays. (2) *Staff*

151. Hauptmann's Plays and Novels. (2) *Staff*

153. Thomas Mann—Novels, Novellen and Essays. His life and philosophy. The course is conducted in English and readings are in translation. Either German or English credit is given. (3) *Nielsen*

SPANISH

1A, 2A. Elementary Spanish. Intensive Course. Two hours daily. (7; F. 7; W.) *Fogelberg*

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

101A. Intermediate Spanish. Intensive Course. (5; S.) *Fogelberg*

101. Intermediate Spanish. (5)

102. Intermediate Spanish. (5) *Fogelberg*

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

106, 107, 108. Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2; F. 1-2; W. 1-2; S.) *Staff*

PORTUGUESE

1, 2, 3. Elementary Portuguese. Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5; F. 5; W. 5; S.) *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. (1-2; F. 1-2; W. 1-2; S.) *Meyer*

LATIN

1, 2, 3. **First Year Latin.** Special emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of our own tongue. Especially recommended for English majors and for pre-law and pre-medical students. The course includes readings from Caesar. (5; F. 5; W. 5; S.) *Thain*

101, 102, 103. **Virgil and Cicero.** Selected readings from the orations of Cicero and Virgil's Aeneid. Miscellaneous readings from other Roman authors. Open to all students who have had one year of college Latin or two years of high school Latin. (3; F. 3; W. 3; S.) *Nielsen*

SPECIAL SERVICE COURSES

21. **French Pronunciation.** Primarily for students in Music, Art, Speech, and Radio. Available to others. Basic drill on pronunciation with special attention to the terminology and proper names encountered in music and art. (2; W.) *Jensen*
 22. **Italian Pronunciation.** Same as for course 21. (2; F.) *Jensen*
 23. **German Pronunciation.** Same as for course 21. (2; S.) *Jensen*
 80. **Medical Latin.** (3; F.)
 81. **Medical Greek.** (3; W.)

Physics

WILLARD GARDNER, *Professor*; ROLLAND R. PERRY, PHILIP J. HART, L. S. COLE, *Associate Professors*; E. W. PAYNE, JAY O. JENSEN, *Assistant Professors*.

See pages 43 and 44 for courses which may satisfy group requirements.

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100.

Suggested courses: The course taken will depend on whether the student wishes to continue with graduate work in Physics or whether he desires to teach in high school. Substitutions or changes must be approved by the head of the department. For each year, the first group of courses should be taken by all majors. Those courses preceded by (**) are for students preparing to do graduate work; and those preceded by (†), are prospective high school teachers. A minimum of 30 senior college credits in Physics must be obtained.

Freshman Year: Physics 20, 21, 22; Math. 34, 35, 46; Bacteriology 1; Economics 51; ** (5 credits Social Science); † (Sociology 70).

Sophomore Year: Math. 97, 98, 99; Chem. 3, 4, 5; ** (German 1, 2, 101); † (Physiology 4; English 10; Psychology 3).

Junior Year: Physics 120, 121, 130; Math. 119, 120, 122; ** (German or French; English 110; 5 credits Biological Science; 5 credit elective); † (Psychology 102a); Education 111, 113, 114; Speech 1, English 110.

Senior Year: 145, 153, 154, one other year course in Physics; ** (Math. 130, 131; Chem. 104, 105, 106; Physics 108, 193, 194, 195); † (Chem. 121; Education 127, 129a and 129b [Winter and Spring] 5 credits; Language group Electives 3-8 credits).

A Teaching Minor in Physics is approved only for students majoring in closely related fields. Such students must complete Physics 20, 21, 22.

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. 4 lectures, 1 lab. (5; F, W or S.) *Payne*

3. **Introductory Physics.** A non-technical course designed for students who do not expect to major in sciences but who want a knowledge and understand-

ing of the fundamental physical principles and their applications. (5; F, W or S.)

Jensen and Payne

6, 7. General Physics. Physics 6 covers mechanics, constitution of matter, heat, and a meteorology. Physics 7 emphasis electricity and magnetism, with a survey of light and sound. Primarily designed for students in Forestry and Agriculture. (5; W, 5; S.)

Jensen

10. Applied Physics. To meet needs of teachers of elementary grades. Emphasis on principles most closely associated with the home and farm. Offered only as an extension class. (5)

Payne

16. Introductory Meteorology. A non-mathematical treatment of fundamental physical laws governing the atmosphere and its phenomena. A brief study of the polar-front theory, air-mass analysis, weather map reading, and forecasting. This course covers information required by the Civil Aeronautics Administration for flying. (5; F, W or S.)

Jensen

17. General Meteorology. (Physics of the Air.) Atmospheric physics and weather phenomena from both the dynamic and synoptic procedures. A brief study of meteorological apparatus, observations, map reading, forecasting and including all of the basic principles of aeronautical meteorology. Prerequisite: Physics 6 or 22 and Calculus. (5; F, W or S.)

Jensen

20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Light and Sound. For Science majors, Engineers, and students preparing for Medicine. Recommended for majors in Agriculture who intend to do graduate work. Prerequisite: a working knowledge of trigonometry. Students not majoring in Physics should take this in the sophomore year. Three lectures, two labs and quiz sections per week. (5; each class taught F, W or S.)

Perry, Hart, Payne

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100.

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

At the beginning of each quarter, the schedule of the following Advanced Physics courses will be arranged to meet the requirements of all registered students.

108. Advanced Laboratory Work. Recommended for students majoring in Physics. Can be taken only by special arrangement. (F, W or S.) Time and credit arranged.

Staff

114. Soil Physics. The fundamental laws of Physics are reviewed, with emphasis on mechanics and thermodynamics and their relation to soil problems. Some time is devoted to significant features of modern physics with particular reference to the theory of surface forces as they influence the behavior of soil colloids. Special attention is given the dynamics of soil moisture. A knowledge of elementary physics and mathematics is essential as well as a good foundation in soils. (3; W.)

Gardner

120, 121. Modern Physics. (Recommended for Juniors.) A study of electrons, ions, atomic structure and radiation. (3; F, 3; W.)

Hart

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

Perry

145, 146. Vector and Tensor Analysis. An introduction to vector and Tensor analysis and their applications. (3; F, 3; W.)

Gardner

153, 154. Analytical Mechanics. (To follow Physics 145.) (3; W, 3; S.)

Gardner

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

Gardner

161. Thermodynamics. A short introduction to thermodynamics. (3; S.)

Perry

166, 167. Geometrical and Physical Optics. (3; W, 3; S.)

Hart

175, 176, 177. Electricity and Magnetism. Electrostatics, Magnetostatics, D.C. and A.C. circuits, Electromagnetism, and Electromagnetic Theory. (3; F, 3; W, 3; S.)

Perry

182. Electronics. The concept of the electron, its relation to the structure of the atom, to the conduction of electricity, to ionization, to photoelectric and

thermoelectric effects, etc. Emphasis is placed on the design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. (4) *Cole*

185, 186, 187, (285, 286, 287). **Introductory Quantum Mechanics.** Prerequisite: Partial Differential Equations. (3; F. 3; W. 3; S.)

190, 191, 192, (290, 291, 292). **Theoretical Physics.** (2 or more each quarter. F, W, S.) *Gardner*

193, 194, 195, (293, 294, 295). **Seminar in Physics.** A weekly meeting of staff and physics majors, consisting of reports on recent developments in Physics. Students may register and receive credit for course by making reports. (1; F. 1; W. 1; S.) *Staff*

250. **Research in Physics.** Credit to be arranged before registration. (F, W or S.) *Staff*

Upon sufficient demand, courses numbered 120-180 will be extended to cover more advanced work. Numbers will follow in consecutive order. Graduate credit may be given for certain upper division courses taken by graduate students upon completion of extra work. In such cases the number will be the corresponding "200" number.

Speech and Drama

CHESTER J. MYERS, *Professor*; REX E. ROBINSON, FLOYD T. MORGAN, *Associate Professors*; E. LEROI JONES, HAROLD I. HANSEN, *Assistant Professors*; STUART HARDMAN, GWENDELLA THORNLEY, WILLIS M. ROSENTHAL, *Instructors.*

Forty-five credits of Speech are to be completed for the major. For prospective teachers, the distribution of these credits is to be as follows: courses in Public Speaking, 10 credits (Speech 25 or 125 required of all majors); courses in Interpretation, 10 credits (Speech 124 required of all majors); courses in Correction, 5 credits; courses in Dramatic Literature, 5 credits; courses in Play Production, 9 credits; elective courses in Speech, 6 credits. Students who do not intend to teach may apply for permission to substitute courses in their special fields of interest for some of those in this outline. A special major for students whose main interest is Speech Correction may be outlined by consultation with the Head of the Speech Department.

All Speech Minors must complete at least 18 credits of Speech work. Courses to be taken will be determined in consultation with the Head of the Speech Department.

Speech 123 is recommended for those who are planning to teach Speech.

Composite English—Speech Major. Students whose major interests are divided among English, Journalism and Speech may take a composite English-Speech major. Such a major relieves the student of the requirement for a minor. This combination is recommended highly. Consult with the Head of the English Department and the Head of the Speech Department. English-Speech majors should take English 1, 53, 118, 119, 163, 180, 190, 191; Journalism 12 (three credits) and 112; Speech 150 (six credits); 10 credits of Speech Corrective Work; 10 credits of Interpretation, including 124; 10 credits of Public Speaking, including either 25 or 109; and Speech 123.

MASTER OF SCIENCE DEGREE

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

The following courses of the 100 series may be modified and used for graduate credit by students majoring in the Speech Department or by students in other departments: 107, 109, 110, 111, 123, 124, 125, 145, 150, 154, 171, 173, 183.

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 will not be given to students who have taken Speech 5. (5; F, W or S.) *Staff*

4. Principles of Reading. The principles of effective oral and silent reading. Emphasis on oral delivery of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes not only standard literature, but also everyday reading matter. (5; F, W or S.) *Thornley*

5. Extempore Speech. Designed to meet the specific needs of professional people in the practice of their profession. Basic principles of effective speaking, with emphasis on preparation and delivery of forms and address of greatest interest to those for whom the course is provided. Credit will not be given to students who have taken Speech 1. (3; F, W or S.) *Staff*

6. Introduction to the Theatre. An elementary study of the Theatre as a business, both professional and amateur. Work includes lecture, outside reading and class discussions. (2; F.) *Hardman*

7. Basic Principles of Voice and Phonetics. A training course, adapted to individual needs and abilities. Exercises for flexibility of voice, articulation, and pronunciation. Recommended for all Speech majors and minors, for prospective teachers, and others whose individual needs cannot be met successfully in Speech 1 or other courses in public speaking and oral interpretation. (3; F.) *Jones*

8. Speech Foundations. For students desiring information regarding all phases of speech and what prospects the fields hold for possible Majors and Minors. The Speech Staff appears before the class for lecture and discussion. This is not a performance course, but rather a survey. Areas in the speech field to be discussed include acting, directing, and technical work of the theatre, speech correction, oral reading and interpretation, public speaking and forensics, and radio. (3; W.) *Hansen and 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 anyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. *Staff*

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

15 or 115. Intercollegiate Debating. Members of the debating squads may receive not more than three credits in any one year. Credit is granted only to those with credit in Speech 13 or 113, Argumentation. (3; F, 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. (3; S.) *Myers*

18 or 118. Story Telling. The story as an educational factor, analysis and classification of typical stories with reference to each period of the child's development. Study of sources; adaptation of material; and actual practice in story telling. Consideration is given stories of western pioneer life. The work is designed to meet the needs of student, teacher, recreational leader, church activity leader, librarian, and parent. (5; F or S.) *Myers*

20 or 120. Playground Dramatics and Pageantry. For those interested in studying principles involved in playground dramatics, make-up, pageantry, storytelling and related activities. (3; W.) *Myers*

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

22 or 122. Playwriting. An introductory study of dramatic composition. The work includes outside reading, class discussions, and the writing of a one act or longer play. (2; S.) *Hardman*

24. Oral Interpretation. Intermediate course. One that puts into practice, by means of platform reading, the principles studied in Speech 4. Various

literary types are prepared for platform presentation. A more specialized and artistic course than Speech 4. (3; F.) *Myers*

25 or 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. (5; W.) *Robinson*

26 or 126. Make-Up. For Speech and Music majors and minors, MIA workers and prospective teachers. Theory and practice in the art of make-up. (2; F.) *Hansen*

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

English 47, 48, 49. (See English Department.)

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

English 63, 163. (See English department.)

67 or 167. Introduction to Speech Correction. Required of all Speech and Speech Correction majors and those taking a composite Speech and English major. It is suggested as an elective for majors in Psychology. This is the first course in speech correction, dealing with common speech defects and remedial measures for problems in lisping, indistinct pronunciation, foreign accent, delayed speech, stuttering, and inappropriate use of the voice. (5; W.) *Jones*

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. Any quarter. Credit arranged. *Jones*

75. Remedial Speech. This course is intended for those who have a noticeable difficulty with speech, in articulation, quality, pitch, intensity, or rhythm. Fall, Winter and Spring. Time and credit arranged. *Jones*

81. Introduction to Radio. Survey of radio station operation, organization and programming and some practice in radio speaking. (3; F.) *Morgan*

106. The Current and Recent Broadway Theatre. Discussion, lecture, and reading of the more recent plays that have been presented on Broadway. An analysis of the play, cast, and staging, including professional critical reviews. (2; S.) *Hansen*

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

109. Public Discussion. Application of various group discussion techniques to current problems. Efforts are made to have some of the discussions presented to various civic and religious organizations or to release them over a commercial radio station. (3; S.) *Robinson*

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 literary types and material to suitable form and length for public reading. (3; F.) *Myers*

111. The Psychology of Speech. The principles of psychology which underlie speech. Problems considered include the nature and origin of speech, language in the child and the psychology of the audience. (3; S.) *Jones*

114. Writing for Radio. (3; W.) (See English Department.)

123. Teaching of Speech. The methods and problems peculiar to the teaching of Speech. A study of the organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2; F.) *Myers*

124. Advanced Interpretation. The mastering of significant selections from the great writers. The student grows in power to interpret permanent literature. Reading from manuscript and from memory. (5; W.) *Myers*

144. Advanced Acting. Problems of characterization, tempo, and more advanced body movement. Analysis of the role. (3; W.) *Hansen*

146. Stage Directing. The fundamental principles of directing plays, musical comedies, pageantry, opera, and the dance. Theory and practice. (3; S.) *Hansen*

150, 152, 154. Drama Production. Study and application of the materials and processes of play production. Scene design and construction, scene painting, lighting, costuming, management, advertising, etc., are studied and principles learned applied to production of plays. Students are assigned to work on staffs and crews of Utah State Theatre and Workshop productions. Speech majors and minors should arrange to take all three quarters of this course during their Junior year. (3; F. 3; W. 3; S.) *Morgan*

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

158. Children's Theatre. Creative dramatics for children. Educational dramatics for students who wish to prepare to direct children in dramatic work. A study is made of plays suitable for primary and intermediate schools. Courses in dramatics are outlined, stories dramatized, and plays produced. The College Training School affords opportunity for this work. Of special interest to prospective elementary school teachers. Consult instructor before registering. (3-5; W.) *Myers*

160. Dramatic Structure. Study and analysis of dramatic structure and technique. For students interested in direction, dramatic literature and play-writing. (2; S.) *Morgan*

171. Speech Pathology. Advanced course in speech correction. It deals with the speech involvements of pathologies of the larynx, mouth, ears, and brain. Disorders such as pathological voice defects, cleft palate, difficulties in hearing and deafness, aphasia, and spastic speech are given particular attention. Prerequisite: Speech 167. (3; S.) *Jones*

181. Radio Production. Planning and presentation of various types of radio programs—dramatic, musical, children's talks, news, feature, variety, special events and audience participation. (3; W.) *Morgan*

183. Problems in Speech and Theatre. Especially selected work, individually assigned, handled and directed in consultation with the student. Special Speech problems of merit and of mutual interest to students and instructors are investigated and reported upon in this course. Consult the instructor for permission to register. Any quarter. Credit arranged. *Staff*

GRADUATE COURSES

200. Seminar in Speech. Emphasis on the various fields of Speech. Research problems. (2; F or W.) *Staff*

201. Thesis. Prerequisite: Graduate standing. (2-5; F, W or S.) *Myers and Staff*

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

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

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

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

207a, 207b. Experimental Phonetics. Prerequisite: Graduate standing. The course aims, first, to present principles involved in the scientific analysis of speech and voice; second, to describe the major laboratory instruments and techniques in current use; third, as far as possible, familiarize the student with actual laboratory practice. (3; W or S.) *Jones*

209. Voice and Articulation Disorders. Prerequisite: Graduate standing. Theory and practice of voice and articulation retraining. Practice in examination diagnosis, and treatment, attention to the problems of both children and adults. Review of studies relevant to the field. (2; W.) *Jones*

211. Organic Disorders. Prerequisite: Graduate standing. To study the various disorders of articulation voice, rhythm and language which are due to organic cause. Particular attention will be paid to speech disorders resulting from cleft lip, cleft palate, and cerebral palsy. (2; S.) *Jones*

Zoology

Zoology, Entomology, Physiology and Nursing

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

D. M. HAMMOND, G. F. KNOWLTON, C. J. SORENSON, *Professors*; J. SEDLEY STANFORD, G. H. KELKER, CLYDE BIDDULPH,, *Associate Professors*; WILLIAM SCHOLES, WILLIAM F. SIGLER, *Assistant Professors*; MERRILL GUNNELL, *Instructor*; FRANK E. TODD, HOWARD E. DORST, F. V. LIEBERMAN, G. E. BOHART, H. F. THORNLEY, GEORGE H. KALOOSTIAN, WALTER E. PEAY, S. J. SNOW, WILLIAM P. NYE, *Collaborators in Research, U. S. D. A.*

For a major in Zoology the following courses must be taken: Zoology 3, 4, 112, two of the following three courses: 116, 117, 118; 119, 124, 126, 131; Entomology 13 and Physiology 121, 122. Students especially interested in the natural history phases of Zoology may make any or all of the following substitutions for a major in Zoology: 155 and 160 for 118, 121 or 122 for 117 121 or 122 for Physi. 122. Also the following courses are recommended: Mathematics 34, 35, 44, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 20, 21, 22; Botany 24, 25; Bacteriology 70, 71; Geology 1, 2. For students planning to do post graduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction to the School of Arts and Sciences must be completed, and in addition the following courses must be taken: Zoology 107, 112, 116, 117, 124, 126, 131; Entomology 115.

MASTER OF SCIENCE DEGREE

The Zoology, Entomology, and Physiology Department offers work leading toward the Master of Science degree in various phases of agricultural entomology, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

The following upper division courses are acceptable for graduate credit for Master of Science Degree candidates in the Department: Zoology 107, 116, 118, 119, 131; Entomology 103, 104, 109, 156; Physiology 121, 122, 123, 180.

The following upper division courses may be used for graduate credit by students majoring in other departments: Zoology 107, 112, 115, 116, 117, 118, 121; Entomology 101, 103, 104, 108, 109, 115, 138, 156; Physiology 121, 122, 123, 160, 180.

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. (5; F, W or S.) *Gunnell*

2. General Zoology. A brief survey of the more important groups of animals, including the organization, behavior, reproduction, classification and relationships of each group. The basic principles of greatest importance in Zoology receive consideration. This course is especially designed to meet the needs of students in Agriculture and Forestry for a basic course in Zoology. Three lectures, two labs. (5; F or S.) *Stanford*

3. Invertebrate Zoology. An introduction to the invertebrate animals. Classification and relationships, structural characters, function and development are emphasized. Some attention is also given to parasitism. This course is well adapted for premedical and preidental students, Forestry (Wildlife) majors, and others who desire a comprehensive introduction to the animal kingdom. Three lectures, two labs. (5; F or W.) *Staff*

4. Vertebrate Zoology. The same general plan as given in course 3 is followed in the study of the vertebrates. Some attention is given to the local fauna. (5; W.) *Stanford*

5. Comparative Vertebrate Zoology. The vertebrates, with emphasis on comparative structure and function, and evolutionary relationships. Three lectures, two labs. (5; W or S.) *Staff*

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

107. History of Biology. The more important men and ideas in the historical development of biology with especial reference to the zoological sciences. (2; F.) *Staff*

111. Heredity. The facts and principles of inheritance, with emphasis on application to human beings. This includes a consideration of how characteristics are passed from parent to offspring, how the most important human characteristics are inherited, and how the human race as a whole is being influenced in its inherited qualities by various agencies and conditions. It is desirable but not essential that an introductory course in biology, physiology, zoology, or botany precede this course. (4; F or S.) *Staff*

112. Principles of Genetics. A technical course in the basic principles underlying heredity and variation, and their application to the problems of plant and animal breeding, and human inheritance. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (5; F or W.) *Staff*

116. Parasitology. The protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Some consideration is given free-living relatives of parasites. Forms occurring in this general region are emphasized. Prerequisite: Zool. 3. Three lectures, two labs. (5; S.) *Hammond*

117. Methods and Elements of Animal Histology. An introduction to the techniques employed in making preparations of animal tissues for microscopic study, and a consideration of the structural characteristics of the tissues and principal organs in representatives of the groups of animals, especially vertebrates. Two lectures, two labs. (4; F.) *Hammond*

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates, including the formation of gametes, fertilization, cleavage, gastrulation, formation of germ layers, establishment of body form, and organogenesis. In the laboratory the development of the frog, chick and pig is studied. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5; W.) *Hammond*

119. Comparative Anatomy. The fundamentals of structure of the vertebrate body. The anatomy of typical representatives of each class of vertebrates and the organic systems from the simplest to the most complex forms are studied on a comparative basis. In the laboratory, the shark and the cat are thoroughly dissected. Prerequisite: Zool. 4 or equivalent. Two lectures, two labs. (4; S.) *Hammond*

121. Ornithology. Bird study planned to acquaint the students with native birds and the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution are studied in classroom, laboratory, and field. Two lectures, two labs. (4; S.) *Stanford*

122. Mammalogy. Designed to introduce the students to the large and very important class, Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance are stressed. Two lectures, two labs. (4; W.) *Stanford*

123. Nature Study. Teachers and other students of nature find in this course an opportunity to learn the names, habits, foods and distribution of the

more common animals in Utah. Attention is also given prominent plants of this area. Laboratory and field trips arranged. Two lectures, one lab. (3; S.)

Stanford
124, 126. Seminar. Students and department faculty meet for one hour each week and hear reports from the members of the seminar on topics of mutual interest. Students majoring in the department must attend and participate in the activities of this seminar for at least two quarters. (1; F. 1; S.) *Staff*

131 or 231. Organic Evolution. A critical study of the facts of evolution as obtained from a consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: some thorough course in Biology. (3; S.) *Staff*

155. Ichthyology. Ecology, classification, and life histories of native and introduced fishes. Two lectures, one lab. (3; W.) *Sigler*

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

199. Minor Problems. Deals with research problems similar to Zool. 201, but intended primarily for undergraduate majors in Zoology. Credit arranged. (F, W or S.) *Staff*

201. Special Problems. The student who wishes to engage in some line of original research and is qualified to do so may elect and study some topic in Zoology. Open to undergraduates only by special arrangement with the department. Credit arranged. (F, W or S.) *Staff*

205. Methods of Research. For students doing or intending to do original work in some line of Zoology or Entomology, this course offers instruction in selection of topics for research, organization of attack upon problems, methods of finding previously published work, outlining the problem, illustration of the thesis, etc. Required of graduate students who are working for a Master's degree in the department. (1; W.) *Staff*

217. Advanced Histological Technique. A continuation of Zoology 117 for graduate students, and for students who wish a more thorough and extensive training in the techniques of preparation of biological materials for study. Additional techniques such as the celloidin method, freezing method, embalming and injection of specimens, etc., will be undertaken. Prerequisite: Zool. 117. (2; S.) *Staff*

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S.) *Staff*

ENTOMOLOGY

For a major in Entomology the following are required: Zoology 3, 4, 12, 106, 107, 111, 131; Entomology 13, 101, 103, 108, 115, 125, 126, 156. The following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 24, 25, 30; and one basic course in each of the following fields: Agronomy, Horticulture and Vegetable Crops. For students who are planning to do postgraduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a major in Agricultural Entomology see Department of Zoology, Entomology and Physiology, in School of Agriculture.

13. General Entomology. The structure, classification, interrelationships, and life histories of insects are studied. Some field trips are taken. Three lectures, two labs. (5; F.) *Stanford*

20. Principles of Beekeeping and Crop Pollination. The general principles of beekeeping and the relationship of bees and other pollinators to fruit and seed production. (2; S.) *Staff*

101. Insect Morphology. Comparative study of insect anatomy with emphasis on structures used in taxonomy. Prerequisite: Ent. 13. Two lectures, two labs. (4; W.) *Stanford*

102. Systematic Entomology. Each student must collect, properly mount, and label a representative collection of insects containing at least 350 specimens, at least 125 species, and at least 15 orders. The whole collection must be arranged in phylogenetic sequence. Classification must include a correct placing of all specimens in order. To be taken only with permission of instructor. Prerequisite: Ent. 13. Three labs a week. (3; F, W or S.) *Knowlton*

103 or 203. Systematic Entomology. Continuation of Ent. 102. The collection arranged for Ent. 102 must be enlarged to at least 700 specimens, 225 species, 100 families, and 18 orders. Classification will include a correct placing of all specimens in families. To be taken only with the permission of the instructor. Prerequisite: Ent. 101. Three labs. (3; F, W or S.) *Knowlton*

104 or 204. Systematic Entomology. Continuation of Ent. 103. Permission to take this course depends on the student's collection for Ent. 102 and 103. If his collection justifies further study, he may select one or two orders of insects and classify them to species. To be taken only with the permission of the instructor. Three labs. (3; F, W or S.) *Knowlton*

105. Forest Entomology. Principal insects attacking forests and forest products. Some attention is also given principles of biological control. A brief study is made of forest vertebrates with emphasis on insect-eating birds. One lecture, two labs. (3; F.) *Stanford*

108. Agricultural Entomology. Insect pests of major economic importance to agriculture in Utah and the West, including their recognition, type of damage inflicted, distribution, life history, and methods of control. Insecticides, together with practical methods and timing of their application. Primarily for upper division students. Three lectures, two labs. (5; F, S.) *Sorenson*

109 or 209. Advanced Economic Entomology. Recognition and control of important insect pests by physical, cultural, biological, mechanical, chemical, and quarantine methods. Prerequisite: Ent. 108. Three lectures, two labs. (5; W.) *Knowlton*

115. Medical and Veterinary Entomology. Arthropods that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease. Prerequisite: Ent. 13 or equivalent. Two lectures, two labs. (4; W.) *Stanford*

125, 126. Seminar. Students are assigned subjects upon which they report to the group. In the winter quarter entomological subjects are assigned; in the spring quarter subjects fundamental to both entomology and zoology. Chiefly for major students. (1; W, 1; S.) *Staff*

138. Aquatic Entomology. Identification, distribution, life histories and adaptations of aquatic insects are studied with particular references to local streams and lakes. Two lectures, one lab. (3; S.) *Stanford*

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

160. Animal Ecology. (See Zoology 160.)

199. Minor Problems in Entomology. Research problems similar to Ent. 210, but intended primarily for advanced undergraduate majors in Entomology. Credit arranged. (F, W or S.) *Staff*

210. Special Problems. Students may select or are assigned problems dealing with certain phases of Entomology. The amount of credit depends on nature of problem and time spent. Open to undergraduate students only by special permission. Prerequisites: Ent. 13, 103 and 108. Credit arranged. (F, W or S.) *Staff*

230. Insects in Relation to Plant Diseases. Important insect vectors of plant disease, their habits, modes of transmission and dissemination of diseases. Rearing and handling methods, equipment and techniques. Prerequisite: Ent. 13 or 108. Three credits, or four credits with laboratory. (F.) *Sorenson*

231. Biological Control of Insect Pests. Biological agents in insect control. Invertebrate parasites and predators, vertebrate predators, and diseases are considered as they relate to suppression or control of insect pests. (3; W.) *Knowlton*

233. Introduction to Aphidology. Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 102. (2; W.) *Knowlton*

234. **Readings in Entomology.** Assigned readings of advanced nature. Credit arranged. (F, W or S.) *Staff*
250. **Research and Thesis.** For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Credit arranged. (F, W or S.) *Staff*

PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 10, 115 or 116 or 117, 121, 122, 123, 180, 195. Also Mathematics 34, 35 and 44; Physics 20, 21 and 22; Chemistry 3, 4, 5, 121, 122; Biochemistry; Zoology 1, 3, 4, 117, 118, 119 and 131, and Bacteriology 70, 71 are recommended.

4. **General Physiology.** For the student who desires a survey of physiology and who is not planning advanced intensive study in the field. It deals with the functioning of the human body with emphasis upon broad general biological principles. 5; F, W or S.) *Staff*

10. **Human Anatomy.** A general study of the anatomy of the human body including the cell, tissues, organs, and systems. Prerequisite: Physiology 4. (5; W.) *Staff*

15. **Personal Health.** Health problems of college students. Prerequisite: Physiology 4. (2; S.) *Scholes*

104. **Kinesiology.** Articulations and muscles with an analysis of movements and actions. The skeleton, manikin and man himself afford laboratory material. (3; S.) *Staff*

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

121, 122. **Physiology.** An intensive and detailed study of physiology. The function of each of the organ systems of man and animals is studied. Unless special permission is granted, students may not register for the second quarter without having had the first. As preparation, Physiol. 4, or Zool. 2, 3, or 4, or Vet. Sci. 20, and a course in physics and chemistry are recommended. Three lectures, two labs. (5; F. 5; W.) *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. (3; S.) *Biddulph*

160. **Special Problems.** Special investigations in physiology are carried out in this laboratory course. Open to student who have taken Physiol. 121, 122 or who have been granted special permission. (2-5; F, W or S.) *Biddulph*

180, 280. **Advanced Physiological Hygiene.** Special problems in hygiene are considered. Previous work in physiology and hygiene are recommended as preparation. (3; S.) *Scholes*

195, 295. **Physiology Seminar.** (1; S.) *Biddulph*

260. **Research and Thesis.** Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S.) *Staff*

NURSING

S. M. BUDGE, O. WENDELL BUDGE, R. N. BARLOW, K. C. RITER, J. C. HAYWARD, OMAR S. BUDGE, J. CLARE HAYWARD, WILLIS H. HAYWARD, H. JOAN BARBER, PEARL POPE, *Special Instructors.*

Through a joint program offered by the College and Logan L.D.S. Hospital girls may earn both a Bachelor of Science Degree and Registered Nurse credentials in four calendar years of study. Part of the time is spent attending classes at the College, part of it attending classes and doing other preparation at the Budge Memorial Hospital, and part at Denver General Hospital.

For further information persons may inquire of Professor William Scholes, Nurses' Adviser at the College, or of the Superintendent of Nursing Training, Logan L.D.S. Hospital.

The courses listed below are taught at the Hospitals in Logan and Denver by members of the staffs of Hospitals. Students must complete the prescribed

Hospital work and enough College courses to make a total of 186 credits before they may receive both the B.S. and R.N. credentials. They must, of course, satisfy the general graduation requirements of the College.

50. Operating Room Techniques and Surgical Principles. Designed to give a comprehensive knowledge of the principles of surgical asepsis. It helps the student acquire skill and thoughtfulness in the care of patients in the operating room and an understanding of the different types of operating room procedures and their relation to nursing care and progress of the patient. Different techniques are given attention. (3) *S. M. Budge and Barber*

51. Orthopedic Nursing. A comprehensive study of body mechanics in relation to the nurse and patient, giving special emphasis to the responsibility and nursing care of the patient in the care and prevention of deformities. Special treatment and nursing care as well as the public health aspects or orthopedics care are emphasized. (1) *S. M. Budge*

52. Surgery and Principles of Surgical Nursing. Etiology, symptoms, nursing care of surgical cases with reference to pre-operative, post-operative and convalescent patients. (3) *O. W. Budge and Barber*

54. Materia Medica and Pharmacology. Drugs in relation to characteristics, dosage, toxicology, methods of administration and therapeutic effects. (4) *Pope*

55. Eye, Ear, Nose and Throat. Lectures on anatomy, physiology and diseases of the eye, ear, nose, and throat. Special stress is laid on nursing care and educational training in prevention measures and public health aspects of these conditions. (1) *Riter*

56. Pathology and Introduction to Medical Science. Gives an over-all picture of medical science to the student nurse as she starts clinical services on the wards. The aim is to acquaint her with the causes of disease, how diagnoses are made, the bases for treatments, preventive measures, and methods of control. Emphasis is placed on fundamental principles which will help the nurse to adjust to the needs of the patient and others. (4) *Pope*

57. Professional Adjustment. Designed to aid the student in developing a desirable personality and traits of character which will help her make satisfactory adjustments in personal and professional life. Special attention given guiding principles and standards of conduct which will enable the student to solve her own problems. (2) *Pope*

58. Principles and Practices of Nursing. Guidance based on scientific basic principles of the nursing profession and practices. Includes general care of the patient and development of skills in nursing procedures which are taught in the classroom and carried out in general practice in the laboratory and wards. (15) *Pope and Staff*

100. Dermatology and X-Ray. Designed to acquaint the nurse with various disorders. Treatment of dermatology including cases indicated and contra indicated with x-ray is especially emphasized. (1) *Omar S. Budge*

101. Urology. A practical and comprehensive course in the anatomy of the genitourinary tract with particular attention to nursing care and health aspects of urological conditions. (1) *O. Wendell Budge*

103. Psychiatric Nursing and Psychiatric Principles. Designed to give an appreciation and understanding of the physical, mental and emotional factors in the integrated personality. Efforts are made to give a practical basic understanding of the etiology, symptoms, and a course of treatment of the common types of mental disorders. Special attention is given educational preventive methods relative to the positive mental health program in the community. Complete outline of psycho-neurotic and psychotic types. (3) *Robert S. Budge*

104. Medicine and Medical Nursing. Designed to give an over-all picture of general medical nursing and care of the medical patient. Special attention is paid to bacterial and infectious diseases, diseases of the heart, lungs, digestive tract and kidneys, metabolic diseases, endocrine disorders and problems of nutrition and allergy. An effort is made to correlate previous training in physiology and pathology and actual case experience in the classroom and sickroom. (6) *J. C. Hayward and Pope*

105. **History of Nursing.** The origin and development of the nursing profession. The course gives the student an understanding of the place of nursing history in relation to world history and the nurse's responsibility in promoting and maintaining its standards. (3) *Barber*

108. **Communicable Disease Nursing.** Nursing care of adults and children in all types of contagious and communicable diseases. Includes a comprehensive knowledge of etiology, treatment, general manifestations, modes of transmission, complications, and modes of prevention through public health channels. (2) *Barber*

109a. **Pediatric Lectures.** Denver General Hospital. (6.)

109b. **Pediatric Nursing Demonstrations.** Denver General Hospital. (2.)

110. **First Aid and Bandaging.** First aid and emergency treatment from nursing stand-point. Responsibilities of nurses in accident prevention and emergency treatment in accident and emergency cases. (1) *Pope*

115. **Gynecology.** A study of the anatomy and physiology of the female reproductive organs in relation to the nursing care of gynecologic diseases. Emphasis on the importance of education in the hygiene of the reproductive system is given. Practical experience and clinical instruction in the care of gynecologic patients is stressed. (1) *Willis H. Hayward*

120. **Obstetrics and Obstetrical Nursing.** A comprehensive course in the physiological and pathological aspects of pregnancy, labor, and puerperium. Emphasis is placed upon the importance of prenatal care, labor room care, delivery room asepsis and care and post partum nursing care. The importance of the nurse as a health teacher in maternity welfare and health is also stressed. (4) *Willis H. Hayward*

125. **Child Development.** Denver General Hospital. (2.)

130. **Management of the Hospital Ward Unit With its Attending Problems.** Denver General Hospital. (1.)

135. **Diet Therapy.** Denver General Hospital. (3.)

136. **Advanced Professional Relations.** Problems the nurse meets after graduation. Legal and social aspects. (3) *Pope*

SCHOOL OF COMMERCE

W. L. WANLASS, *Dean*

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General Information

THE purpose of the School of Commerce is to give opportunity for a liberal education with special emphasis upon the commercial, social and political phases of life. Persons who complete the courses offered in this School are prepared to assume leadership and responsibility in business and in various industries and professions. In order to meet the growing demand and to keep pace with recent tendencies in education, students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Business Education, Economics, Political Science, Sociology, Agricultural Economics and Marketing.

For the professions of law and medicine some of these subjects such as Economics or Political Science afford excellent preparation. Graduates are prepared for positions as teachers in high school. Many desirable positions as industrial managers are open to those who are qualified by training and experience. Many students who are especially qualified find employment in the field of retail and wholesale merchandising.

Special attention is called to the many opportunities for service in sociological and governmental work. (See Training for Government Service.) The Departments of Political Science and Sociology offer basic and professional courses in these fields.

For requirements for admission, certification, and graduation see pages 43 to 51.

NOTE: All students in the School of Commerce are urged to take Textiles and Clothing 15 and Principles of Nutrition 5, School of Home Economics.

Pre-Legal Training

Students who plan to go into the profession of Law may pursue a course of study, primarily in the School of Commerce, that will not only enable them to meet all entrance requirements in any American law school, but will also form an excellent foundation for the study of law.

Some law schools admit only college graduates. Others admit students on the basis of three years of college training. College graduation is desirable even where it is not required for admission.

Prospective law students may major in any department in the School of Commerce, but not less than fifteen credits of work should be done in each of the following fields: Accounting, Economics, Political Science, Sociology, History and English, in addition to meeting the requirements for graduation in the Major Department.

All pre-legal students should consult Professor M. R. Merrill.

Training for Government Service

The Federal Government during recent years has employed increasing numbers of College-trained men and women who are qualified for service in its various departments. In all probability this expansion of government activity will continue for several years. In suggesting the following courses the School of Commerce has attempted to indicate lines of study which will be helpful in preparing for government service. With slight modification, these courses will serve equally well to qualify the student for desirable positions outside the field of government service, as the basic requirements in both fields are similar.

Suggested Courses

- I. **Accounting:** Accounting 1, 2, 29, 101, 102, 103, 105, 11, 120, 121, 127; Political Science 129.
- II. **Land Economics:** Economics 28, Economics 51, 52 or Agricultural Economics 53a, b; Agronomy 56; Political Science 1, 10 and 129; Business Administration 141; Agricultural Engineering 108; Geology 3.

In addition the student should satisfy the requirements for a major in Agricultural Economics.

- III. **Marketing:** Economics 28, 51, 52 or Agri. Econ. 53a, b; Mathematics 30, 60, 111.
- IV. **Consular and Diplomatic Service:** Political Science 10, 11, 12, 13, 101, 102, 104, 105, 106, 107, 129; German, French, Portuguese, or Spanish, depending upon the location desired; English 10 or 11, 111; Economics 51, 52, 140.

V. **General Administrative Training:**

It is felt that anyone contemplating government service should have an intimate knowledge of the workings of our government and its relationship to industry. To supply that need the following courses are suggested: Political Science, 10a, 103, 129, 200; Economics 125, 147.

- VI. **Statistics:** Mathematics 30, 35, 60 and 111; Economics 28, 51, 52, 131, 132.

- VII. **Secretarial Science:** Secretarial Science 30, 65, 80, 81, 82, 89, 90, 91, 94, 98, 175, 183, 184, 186, 187; Business Administration 1, 2, 25, 101, 135, 136; Economics 51, 52, 140; Political Science 10, 129; Sociology 70.

VIII. **Sociology:**

For Case Work:

Psychology 103a and 103b, 110.

Child Development 60.

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

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

For Social Research:

Mathematics 34, 35 and 111.

Sociology 70, 202, 220.

Thirty hours of factual courses in the Department.

Field Work under supervision.

- IX. **Economics:** Mathematics 30, 34, 60, 111; Economics 27, 28, 51, 131; Sociology 70. And the courses listed for those majoring in Economics.

X. **Agricultural Economics:**

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

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

Agricultural Economics and Marketing

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

W. P. THOMAS, G. T. BLANCH, W. W. OWENS, *Professors*; D. A. BROADBENT, V. L. ISRAELSEN, G. A. CARPENTER, R. H. ANDERSON, *Associate Professors*; E. M. MORRISON, E. W. LAMBORN, M. H. TAYLOR, *Assistant Professors*; R. R. PAYNE, *Research Assistant*; H. R. HOCHMUTH, L. A. REUSS, *Collaborators in Research*.

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

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

In order 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 for this prescribed course may be obtained from the office of the Department of Agricultural Economics.

A Master of Science Degree: The Department of Agricultural Economics offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in the field of 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 of Agricultural Economics: 102, 104, 105, 106, 113a, 113b, 114, 116, 120, 121a, 121b. For graduate students in other departments the following courses may be used for graduate credit: 102, 104, 105, 106, 113a, 113b, 114, 116, 120.

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

Business Administration

(Including Accounting and Merchandising)

P. E. PETERSON, *Professor Emeritus*; V. D. GARDNER, W. L. WANLASS, *Professors*; L. MARK NEUBERGER, *Associate Professor*; INA DOTY, CLARA P. WEST, NORMAN E. TAYLOR, NORMAN S. CANNON, *Assistant Professors.*

Students majoring in Business Administration and Accounting may concentrate in the fields of Accounting, Finance Management Merchandising, Secretarial Science and Business Education. Students are advised to select from the courses listed below to complete their major and technical subjects according to their field of concentration. (Students majoring in Secretarial Science should register under the advice of the Instructional Staff for Secretarial Science.)

CREDIT TOWARD MASTER OF SCIENCE DEGREE

With the approval of heads of related departments in which students are candidates for the Master of Science degree, Courses No. 101 or above in the Department of Business Administration and Secretarial Science are acceptable for graduate credit.

RECOMMENDED COURSES FOR MAJOR AND SPECIAL GROUPS IN BUSINESS ADMINISTRATION

		Freshman Year					
Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising	
B.A.	1-2	Int. Accounting	10*	10*	10*	10*	
B.A.	63	Salesmanship			3	3	
Econ.	51	General Economics	5*	5*	5*	5*	
Econ.	27	Economic Dev. of U. S.	3	3	3	3	
Econ.	28	Economic Geography of World	3	3	3	3	
Psy.	3	Psychology	5	5	5*	5*	
B.A.	20	Problems of Small Business	---	---	5*	5*	
Soc.	70	Principles of Sociology	---	---	5*	---	

		Sophomore Year					
Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising	
B.A.	25	Int. Business Administration	5*	5*	5*	5*	
B.A.	59	Blue Print Reading and Ind. Draw.	3*	3*	3*	3*	
B.A.	62	Int. Marketing	5	5	5*	5*	
B.A.	28	Int. Business Finance	5*	5*	5*	5*	
B.A.	55	Int. Personal Administration	---	---	3*	3*	
Econ.	52	Advanced General Economics	5*	5*	5*	5*	
Math.	34	Algebra	3*	3*	3*	3*	
Math.	30	Math. 30 for Bus. & Acct. Students	3*	3*	3*	3*	
Math.	60	Math. of Investment	3*	3*	3*	3*	
Psych.	54	Psychology of Business	3	3	3*	3*	
P.S.	11-12-13	Commercial Law	9*	9	9	9	
S.S.	65	Indexing and Filing	3*	3*	3*	---	

*Urgently recommended.

Junior Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	101-2-3	Problems in Acctg. Principles	9*	9*	9*	9*
Econ.	125	Labor Problems	---	---	3*	---
Math.	111	Elementary Stat. Methods	5*	5*	5*	5*
B.A.	129	Government Accounting	3*	3	---	3
B.A.	140	Insurance	3	3	3	3
Soc.	140	Social Psychology	---	---	3*	---
B.A.	141	Real Estate	---	3*	3	3
Econ.	147	Social Security	---	---	3*	---
B.A.	151-2-3	Prob. in Merchandising	---	---	5	9*
B.A.	156	Principles and Probl. of Advt.	---	---	5	5*
B.A.	161-2-3	Problems in Retail Distribution	---	---	9	9
Econ.	145	Economics of Consumption	---	---	2	2
Econ.	165	Money and Credit	3*	3*	3*	3*
P.S.	104-5-6	Commercial Law	9*	9*	9*	9*

Senior Year

Dpt.	No.	TITLE OF COURSE	Accounting	Finance	Bus. Adm.	Merchandising
B.A.	105-6 7	C-PA Problems	9*	---	---	---
B.A.	111	Cost Accounting	5*	5	5	5
B.A.	120-21-22	Auditing Principles	9*	9	---	---
B.A.	124-5-6	Accounting Seminar	2*	---	---	---
B.A.	127-128	Income Tax Accounting	6*	6*	---	---
B.A.	130	Investments	5	5*	5	---
Econ.	131-2	Business Statistics	6*	6*	6*	6*
B.A.	133	Industrial Management	5	5*	5*	5*
B.A.	135-6	Budgets	6*	6*	6*	6*
B.A.	149	Business Policy	5	5*	5*	5*
B.A.	154	Industrial Purchasing	---	---	4*	4*
B.A.	160	Sales Management	---	---	3	3
B.A.	164	Credit Administration	4*	4*	4*	4*
Sec.Sc.	175	Office Management	3*	3*	3*	3
Econ.	107-8	Advanced Economics	6*	6*	6*	6*
Econ.	171	Economics of Business Cycles	3*	3*	3*	3*
P.S.	107-8	Commercial Law	6*	6*	6*	6*

Note: Inasmuch as some of the above courses are taught only every other year, the student is not required to take the courses in the year indicated. However, the general outline should be followed whenever possible.

Special Offerings for Returning Veterans Who Are Not Candidates for Degrees

For capable, mature persons whose education has been interrupted by the war and who want maximum professional training in a minimum of time, two two-year courses in addition to the one in Secretarial Science have been organized in the School of Commerce. These courses minimize liberal course offerings and concentrate upon vocational and professional courses. One gives training in merchandising and the other in accounting. Only those students who know definitely that they will not seek a degree should pursue these courses and then only after consultations with the head of the department. A special course in problems of small business is included.

ACCOUNTING

1, 2. **Introductory Accounting.** Presents basic principles of accounting in the form of lectures, questions, problems and practice sets which require application of the theory advanced. Principles and techniques learned here will be useful as a basis for further study of accounting and as an aid in the understanding of the more common problems of business. Technique will be emphasized. (B.A. 1:15; F or W. B.A. 2:5; F or S.) *Cannon*

Burrough's Calculator. (See Secretarial Science 94.)

Commercial and Bank Posting. (See Secretarial Science 98.)

Mathematics for Business and Accounting Students. (See Math. 30.)

*Urgently recommended.

Mathematics of Investment. (See Math. 60.)

100. Accounting for Non-Commercial Students. A brief course for students in Engineering, Agriculture, Home Economics, Forestry, and other non-Commercial students. (3; F or W.) *Gardner*

100L. Accounting for Non-Commercial Students. Laboratory optional for those taking accounting 100. Recommended where possible. (1; F or W.) *Gardner*

101, 102, 103. Advanced Accounting Principles. A basic course in the fundamental technique and principles of accounting. To give a working knowledge of accounting as it serves the business executive is the primary aim of this course. It should prove valuable to students who aspire to a career in accounting, and also to teachers, lawyers, engineers and farmers. Interpretation and use of accounting as a tool of management is emphasized. Since facility in analysis can be acquired only through abundant practice, a variety of problems and home assignments are provided. Graduate credit may be allowed upon the completion of some additional work. (4; F. 4; W. 4; S.) *Gardner*

105, 106, 107. Problems. Selected problems from professional examinations of various states. (3; F. 3; W. 3; S.) *Cannon*

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

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

124, 125, 126. Accounting Seminar. (2; F. 2; W. 2; S.) *Cannon*

127, 128. Income Tax Accounting. Current Federal and State Income Tax Laws. Practical problems in the preparation of Income tax returns. (3; F. 3; W.) *Cannon*

129. Governmental Accounting. Basic principles underlying the treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. (3; F.) *Peterson*

BUSINESS ADMINISTRATION**Business Communications.** (See Secretarial Science 30.)

20. Problems of Small Business. A survey of problems encountered in starting a small business. Consideration is given problems encountered before operations are started, such as selecting the right type of business, form of business, permits, licenses, choosing a location, credit and financing. In addition, the problems and details of actual operating procedures such as accounting controls, insurance, taxes, buying and selling are considered in relation to various types of small business operation. Designed to aid the man just entering business. (5; W or S.) *Taylor*

25. Introductory Business Administration. Fundamentals of business administration. Provides a background for the study of the more complex problems of business. Not open to freshmen. Lectures and reports. (5; F.) *Neuberger*

28. Business Finance. The structure of the corporate enterprise; providing for a new company; expansion of existing companies; recapitalization and reorganization of the corporation. Financial and operating ratios are discussed. Proper financial plans and methods of marketing securities are also considered. Open to qualified sophomores. Prerequisites: Econ. 51, 52 or equivalent, B.A. 1, 2. (5; S.) *Gardner*

30M. Business Mathematics. For students in B.A. (3; F or W.) *West*

Commercial Art and Posters. (See Art 31.)

Color. (See Art 32.)

Psychology of Business and Industry. (See Psychology 54.)

55. Introduction to Personnel Administration. A critical analysis of the problems of labor management which confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. (3; S.) *Neuberger*

B.A. 59. Blueprint Reading and Industrial Drawing. (See Civil Engineering 59. Required of all sophomore majors in business administration.)

Mathematics of Investment. (See Math. 60.) Urged for all accounting and business administration majors.

Indexing and Filing. (See Secretarial Science 65.)

Elementary Statistical Methods. (See Math. 110 or 111.) Recommended for accounting and business administration majors.

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

130. Problems in Investment. With concrete cases used as a basis of discussion, the varying investment needs of different classes of people are studied in the first part of the course. In the second part, attention is given to different types of investment houses. In the third, types of investment securities are analyzed. (3; W.) *Peterson*

Business Statistics. (See Economics 131, 132.) Required of all business administration majors.

133. Industrial Management Problems. Selected cases are taken up for study and report. Problems in industrial location; on choice of site; on buildings and layouts; on selection, purchase, and arrangement of equipment; on purchasing of stores; on organization; on industrial research; on labor relations and on problems in managerial control. Prerequisite: B.A. 25 or B.A. 20. (5;F.) *Gardner*

135. Budgets. The organization and practical application of the budget in modern business. Emphasis is given the managerial aspects of budgets as an instrument of control. Practical problems in the formulation and execution of business budgets are provided. (3; S.) *Peterson*

137. Business and Professional Ethics. After a general survey of the science of ethics, special consideration is given those principles of professional conduct which are rapidly being introduced into modern business. The work of trade associations and professional organizations is critically analyzed. (3; W.) *Wanlass*

Risk and Risk Bearing. (See Economics 139.)

140. Insurance. Studied primarily from the standpoint of the consumer of insurance services. Among the topics treated are: types of life and property insurance contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management and government supervisory over insurance companies. Attention also given the findings of the Temporary National Economic Committee in its study of the life insurance industry. (3; F.) *Taylor*

Social Psychology. (See Sociology 140.) Recommended for all business administration majors.

141. Real Estate. For those who will be considering the purchase of real estate and of securities based upon real estate, and as an introduction to the general field of real estate contracts, forms, and principles. Recent Federal housing legislation is analyzed. (3; W.) *Staff*

Social Security. (See Economics 147.) Strongly recommended for all business administration majors.

149. Business Policy. A co-ordinating course aimed to develop perspective and judgment and facility in solving business problems. Problems are discussed in production, distribution, personnel, finance, control, legal and ethical aspects of business. Required of all majors in Business Administration. (5; S.) *Gardner*

Money, Credit and Prices. (See Economics 165.) Strongly recommended for business administration majors.

Office Management. (See Secretarial Science 175.)

Economics of Business Cycles. (See Economics 171.) Required of all business administration majors.

190. Seminar in Business Education. (See Secretarial Science 190.)

191. Business Administration Seminar. Special reports and group discussion on current developments in business will be made. Open only to qualified juniors and seniors. (1; F, W or S.) *Staff*

BUSINESS EDUCATION

The School of Commerce and the School of Education cooperate in meeting the demand for well-trained teachers of business subjects. In the selection of their courses in business, secretarial science, and education, students should advise with Professor Neuberger. For complete certification requirements see *School of Education*.

Courses in Business Education

- *179. **Methods of Teaching Typewriting and Bookkeeping.** (Not given 1948-49.)
- *180. **The Teaching of Shorthand.** (3; W.)
- 189. **Practicum in Business Education.** (1-2; F, W or S.)
- 190. **Seminar in Business Education.** (2;S.)
- 191. **Problems in Teaching Business Subjects.** (3 Summer.)

MERCHANDISING

62. Principles of Marketing. (See Ag. Econ. 52.) Required of all majors in business administration.

63. Salesmanship. The history, development and opportunities in sales work are covered. The necessity and methods of securing proper preparation for sales work in order to meet the problems encountered in both direct selling and retail selling are analyzed. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance are studied. For those who desire, special projects can be carried out in relation to a particular field or type of selling. Lectures and assigned cases. (4; F or S.) *Taylor*

151, 152, 153. Problems in Merchandising. The aim is to present by means of carefully selected cases the manager's merchandising problems. Methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. (3; F. 3; W. 3; S.) *Taylor*

154. Purchasing. Involves a study of the significance of purchasing as a major activity in modern business. Consideration given organization, policies and control of the procurement function. Lectures and problems. (4; W.) *Taylor*

156. Principles of Advertising. Intended for those who as business executives will direct publicity programs. Includes study of the structure of advertisements, appeals used in the preparation of advertisements for different products, choice of media, consumer research and the work of advertising departments and agencies. Actual cases are studied and analyzed to lead the student to judge the possibilities of advertising as a sales tool for various products and firms. Selected reading and cases. (5; S.) (Not given 1948-49.) *Taylor*

160. Sales Management. Aims to give a broad view of the important phases of sales administration, planning and execution as applied to manufacturing and wholesale concerns. It deals specifically with the structure and functioning of the sales organization and the correlation of its activities with those of the production and other departments of the business enterprise. Specific attention is given such topics as: marketing policies, sales planning, sales branches, selection and training of sales force, control of sales operation, sales budgets, volume, margins and profits. (5; S.) *Taylor*

161, 162, 163. Problems in Retail Distribution. For students who wish to gain an understanding of the marketing field from the viewpoint of the retail distributor. The problems given major attention are: types of retail institutions, accounting and statistics, location, store layout, merchandise classification,

*Either (but not both) of these courses may be used as an elective in Education.

service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. Selected reading and cases. (3; F. 3; W. 3; S.) *Peterson*

164. **Credit Administration.** The 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. (3; F.) *Taylor*

Economics

W. L. WANLASS, *Professor*; E. B. MURRAY, *Associate Professor*; L. J. ARRINGTON, NORMAN G. CANNON, *Assistant Professors*; CHARLES T. STEWART, *Instructor*.

See pages 43 and 44 for courses which may satisfy group requirements.

Students majoring in this Department should include the following Upper Division courses in either the major or related work. Economics 106, 107, 108, 125, 131, 135, 140, 147, 155, 165, 171, 174, 211; Agricultural Economics 113a; Business Administration 101, 102; Political Science 105, 106, 107; 108, 116.

MASTER OF SCIENCE DEGREE IN ECONOMICS

The Economics Department offers a program of study leading to the Master of Science degree. The following courses may be taken in preparation for this degree: Economics 107a, 107b, 125, 131, 132, 135, 155, 165, 171, 174, 200, 205, 206, 207, 209, 211.

The following may be taken for graduate credit by students in other departments: 107a, 107b, 125, 135, 165, 171, 174, 200, 205, 206, 207, 209, 211.

26. **Economic Development of Europe.** The Classical and Medieval heritage of Modern Europe. A study of the Commercial Revolution and the Industrial Revolution: their history, consequences and interrelationship with political and social development. (3; F.) *Stewart*

27. **Economic Development of the United States.** The historical development of economic factors. Particular attention is given the rise of the American labor movement, the development of the monetary and banking system, the evolution of commerce and communication, and the course of American industrial development from the small one-man business of early times to the great corporations of today. (2; W.) *Stewart*

28. **Economic Geography.** The physical environment and climate and their effects on man and civilization. A survey of world resources, commerce and industry. The factors of location and trade. (3; S.) *Stewart*

51. **General Economics.** For the general college student regardless of his field of specialization. The emphasis is on an understanding of principles and institutions that underlie the operations of the economic system. (5 F, W or S.) *Staff*

52. **Economic Problems.** A continuation of Economics 51. The problems of labor, finance, economic instability, international economics, social waste, government control, and world economic systems. Required as a prerequisite to all senior college courses in the School of Commerce except in Agri. Econ. (5; F, W or S.) *Staff*

106. **History of Economic Thought.** A critical study of the origin and the development of the economic theories of leading thinkers in leading nations of the world from 1750 to the present. (3; F.) *Wanlass*

107, 108. **Intermediate Economic Theory.** A critical analysis of present-day economic theories of value, distribution, and related subjects. Must be taken by all students majoring in Bus. Adm., Agri. Econ., and Econ. Prerequisites: Econ. 51, 52 or Ag. Econ. 53a, 53b. (3; W. 3; S.) *Wanlass*

125. **Labor Economics.** The emphasis is on the theory and practice of collective bargaining. Special attention is given recent legislation that has promoted the growth of organized labor. Current issues in industrial relations are critically analyzed. (3; S.) *Murray*

131, 132. **Business Statistics.** Application of statistical methods to business problems with attention to graphs, analysis of time series, interpretation of in-

dex numbers and the statistics of particular industries and busines in general. Prerequisites: Math. 111; Econ. 51 and 52. This course may be used for a major in Bus. Adm. (3; W. 3; S.) *Cannon*

135. Transportation Economics. Emphasis is placed on railroad transportation in the United States. Some attention will be given to highway and airway transportation. The underlying economic principles receive more attention than the practical phases of transportation. Special attention is given those problems peculiar to the intermountain section. Prerequisites: Econ. 51, 52. (3; F.) *Murray*

139. Risk and Risk Bearing. The risks of economic life. Hedging, the short sale, futures and spot transactions, and the produce and stock exchanges are studies as well as the institution of insurance. Methods of shifting, reducing and assuming risks are studied. Prerequisites: Econ. 51, 52. (3; S.) *Stewart*

140. International Economic Relations. Special attention is given basic economic relationship between industrial nations of the world, international commerce, tariffs, and trade restrictions, international debt and finance, and various means of promoting progress on a basis of sound economics. Prerequisites: Econ. 51, 52. (2; F.) *Stewart*

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. (2; F.) *Arrington*

145. Economics of Consumption. There is an economics of consumption that is as important as the economics of production. This course deals with personal and group expenditures, standards of living, budgets, variations in consumption, etc. (2; F.) *Wanlass*

147. Social Security. A 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. (Not given 1948-49.) *Murray*

150. Comparative Economic Systems. The more important present forms of economic organization: their history, theory, and practices. Emphasis on Capitalism, British Socialism, German Fascism, and Soviet Communism. (3; S.) *Stewart*

155. Principles of Taxation. Taxation in war and peace. Government expenditures. Taxes as a means of raising revenues and as a means of social reform. The American tax system. The general property tax. Our income tax. Death taxes. Taxes upon business. Social insurance taxes. The effects of taxes in the American economy. War and postwar finance. Special attention is given the tax problems of Utah. (3; W.) *Wanlass*

165. Money, Credit, and Prices. The structure and operations of money and financial institutions. Special attention given bimetallism, the gold standard, the money market and the relation of money and credit to prices. Prerequisites: Econ. 51, 52. (3; F.) *Wanlass*

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

174. Corporate Concentration and Public Policy. The history and development of giant corporations; the extent, characteristics, and significance of corporate monopolies and oligopolies; international cartels. Possible public policies: anti-trusts activity, cooperatives, government regulation, government operation. (3; W.) *Arrington*

175. Public Utility Economics. Public utility operations, regulation and problems. The semi-private, semi-public nature of the utilities renders them an especially apt subject for special treatment in a period when the question of government ownership vs. government control is under consideration. Prerequisites: Econ. 51, 52. (3; S.) *Wanlass*

200. Research in Economics. Special investigations in problems in economics may be carried on by senior and graduate students. Credit granted according to work done. (F, W or S.) *Wanlass*

205. Graduate Seminar in Monetary and Banking Theory. The relation of monetary and banking theories to the problems posed by current world difficulties is examined in some detail. Open to graduate students and seniors with adequate preparation. (2) *Murray*

206. Graduate Seminar in Fiscal and Tax Problems. Problems of attaining economic stability through use of government fiscal policy. Attention focused upon problems which have resulted from World War II. (2) *Wanlass*

207. Graduate Seminar on Monopoly and Combination. Our economic society has been characterized by freedom of enterprise and competition, but numerous public and private attempts have been made to control the production and marketing of agricultural and industrial commodities. The growth, development, and present status of these control schemes, both domestic and international are traced and appraised. (2) *Arrington*

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

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*

Political Science

F. D. DAINES, *Professor Emeritus*; M. R. MERRILL, ASA BULLIN, *Professors*;
WENDELL ANDERSON, *Assistant Professor*.

See pages 43 and 44 for courses which may satisfy group requirements.

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

1. Government and the Individual. Introduces the student into the political world of American democracy. Study is made of totalitarian governments and the philosophies of fascism and communism which form the theoretical bases of these regimes. Democracy as practiced in the United States and Great Britain is contrasted with these systems. (5; F or W.) *Merrill*

10. American National Government. Major attention is given to the national government. It is desirable but not required that it be taken before upper division courses in Political Science. (5; F, W or S.) *Staff*

11, 12, 13. Commercial Law. Course 11 is a general survey course intended for students outside the School of Commerce as well as an introductory course for students who take any additional Commercial Law courses. Courses 12 and 13 are devoted to comprehensive study of the law of contracts and agency. Open to all students of sophomore standing or above. (3; F. 3; W. 3; S.) *Bullen*

15. American State and Local Government. The emphasis is on state, municipal and county or rural governments. It follows Political Science 10. (5; S.) *Staff*

20, 21. Government in the Modern World. A general study of government designed particularly for students majoring in professional fields and particularly for students in the School of Engineering. Other students, however, may register for this course but students who register for Political Science 1 should not register for this course. Basic features of the American government system are discussed in 20, while other contemporary political systems are discussed in 21. Students may take either or both quarters without prejudice. (3; F. 3; W.) *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. (3; S.) *Daines*

75. Latin American Governments. The various Latin American governments are discussed. Attention also is given political and economic relations of the United States with the Latin American states. (3; S.) *Anderson*

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

102. International Political Relations. Psychological, economic, racial, and other obstacles to international cooperation, as exemplified in recent events. The Treaty of Versailles; international law, the League of Nations; and present-day world politics including the present program for world cooperation and government are discussed. (3; W.) *Merrill*

103. Principles and Problems of Government. A survey of public affairs and governmental action in the modern world. Designed primarily for upper division students majoring outside the field of the social sciences but who desire some competence in the analysis of modern politics. (3; F.) *Merrill*

104, 105, 106, 107, 108. Commercial Law. Course 104 is a study of the law of negotiable instruments, while 105 and 106 include the study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the study of the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 107 and 108 will be given in 1949-50. Prerequisites: Political Science, 11, 12, 13. (3; F. 3; W. 3; S.) *Bullen*

110. Post-War Problems in International Relations. Examines the various proposals for a world organization now being made and instituted together with an analysis of the various philosophies and systems of government that conceivably might arise as a result of vast changes now evident in the world. (3; S.) *Daines*

111. International Organization. Examines briefly the attempt of the past to achieve some type of international organization. Major emphasis on League of Nations and United Nations, particularly the latter. Also a limited examination of other programs now suggested. (3; S.) *Anderson*

117, 118, 119. American Political Thought. The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, modes of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Students may register for one, two or three quarters. (2; F. 2; W. 2; S.) *Daines*

124. Public Opinion and Propaganda. Open to upper division and graduate students, and to lower division students upon recommendation of the departmental instructors. Considers politics in its dynamic aspects. The nature of public opinion and the various concepts and techniques of propaganda in domestic and international relations employed by pressure groups, political parties and national states. No prerequisite. (3; F.) *Staff*

127. Constitutional Law. A foundation course in American Constitutional Law with the case method being used extensively. Prerequisite: Political Science 10. (5; F.) *Anderson*

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

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

140. American Legislation. Organization and procedure of legislative bodies. Influences at work in and the character of the output of the national and state legislatures. The laboratory method of approach is used as far as is feasible. Parliamentary law is emphasized. (3; W.) *Anderson*

146, 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. (3; F. 3; W.) *Daines*

150. Recent Political Thought. Political ideas and writers from the close of the 18th Century to the present, with a particular emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3; S.) *Daines*

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

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

204, 205, 206. **Seminar in Political Science.** This is a two-credit course each quarter with emphasis on one phase of the subject each quarter. Only seniors and graduate students with a major in one of the social sciences may register. (2; F. 2; W. 2; S.) *Staff*

Secretarial Science

V. D. GARDNER, *Professor*; L. MARK NEUBERGER, *Associate Professor*;
INA DOTY, CLARA P. WEST, *Assistant Professors.*

Students majoring in Secretarial Science must complete the following courses in addition to the institutional requirements for graduation. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.

Curriculum in Secretarial Science for B. S. Degree

Dept.	No.	Title of Course	Credit
Sec. Sci.	30	Business Communications	3
Sec. Sci.	65	Indexing and Filing	3
Sec. Sci.	75, 76, 77	Elementary Shorthand	9
Sec. Sci.	80, 81, 82	Intermediate Shorthand	9
Sec. Sci.	69, 70, 71	Transcription Practice	3
Sec. Sci.	86, 87, 88	Elementary Typewriting	3
Sec. Sci.	89, 90, 91	Advanced Business Typewriting	3
Sec. Sci.	94	Burroughs Calculator	2
Sec. Sci.	90	Commercial and Bank Posting	2
Math.	30	Mathematics 30	3
B. A.	1, 2	Introductory Accounting	10
B. A.	25	Introductory Business Administration	5
English	2	Mechanics of Writing	3
English	5	Scientific Vocabulary (or Foreign Language†)	3
†Econ.	51	General Economics	5
†Econ.	52	Economic Problems	5
Sec. Sci.	170	Statistical Typewriting	2
Sec. Sci.	175	Office Management	3
Sec. Sci.	183, 184, 185	Advanced Speed Shorthand	9
Sec. Sci.	186, 187	Secretarial Science	6
‡Sec. Sci.	179	Methods of Teaching Typewriting and Bookkeeping	3
‡Sec. Sci.	180	Methods of Teaching Shorthand	3
Sec. Sci.	190	Seminar in Business Education	2
B. A.	101	Problems in Accounting Principles	3
B. A.	Elective	Business Administration (Senior College)	3
Econ.	Elective	Economics (Senior College)	3
Electives		Electives (27 of which must be Senior College)	42

Students wishing a teaching certificate in Secretarial Science must add the following courses: Psychology 3 and 102a and b, Education 111, 113, 127, 129a, 129b, 114, 116, 145, and Physiology 145. See School of Education for additional requirements.

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.

†These courses count toward filling the group requirements.

‡Required for a teaching certificate.

Two-Year Secretarial Course

First Year			Second Year		
Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Biol. Science	5	Accounting 1	5	Accounting 2	5
Mechanics of Writing	3	Calculator 94	2	Bus. Communications	3
El. Shorthand	3	El. Shorthand	3	Bank Posting 98	2
Typewriting	1	Typewriting	1	El. Shorthand	3
P. E. or M. S.	1	El. Psychology	5	Typewriting	1
Mathematics 30	3	P. E. or M. S.	1	P. E. or M. S.	1
Total	16	Total	17	Total	15
Second Year			Second Year		
Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Int. Shorthand	3	Int. Shorthand	3	Sophomore Comp.	5
Transcription Pract.	1	Transcription Pract.	1	Int. Shorthand	3
Adv. Typewriting	1	Adv. Typewriting	1	Transcription Pract.	1
Bus. Administr'n 25	5	Economics 51	5	Adv. Typewriting	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	Ediphone	
Total	17	Total	16	Transcription	1
				Total	17

30. Business Communications. Fundamental principles of business letter writing. Practice in writing sales, order, collection, adjustment, and application letters. Prerequisite: English 2. (3; W or S.) *Neuberger*

65. Indexing and Filing. Drill and practice in alphabetic, numeric, triple check automatic, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters, cards, blue-prints, catalogs, and other business forms. (3; F, W or S.) *Neuberger and Doty*

***69. Transcription Practice.** Designed to develop skill and speed in the transcription of letters from shorthand notes. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words a minute. (1; F or W.) *West and Doty*

***70. Transcription Practice.** Continuation of 69. (1; W or S.) *West and Doty*

***71. Transcription Practice.** Continuation of 70. (1; W or S.) *Doty*

75. First Quarter Shorthand. For students who have had no previous training in shorthand; includes a study of the fundamentals of shorthand by the functional method. Emphasis on developing fluency in reading and writing from shorthand plates. (3; F or W.) *West and Doty*

76. Second Quarter Shorthand. Continuation of course 75. Emphasis on the writing of shorthand. (3; W or S.) *West and Doty*

77. Third Quarter Shorthand. Continuation of course 76. Practice in new-matter dictation. (3; F or S.) *Doty and West*

80. Intermediate Shorthand. For students who have had previous training in shorthand and who are able to take dictation at 60 words a minute. Includes a review of the theory of Gregg shorthand and the development of new vocabulary and phrase writing. Students must be able to type at least 40 words a minute and must register for Transcription Practice 69. (3; F or W.) *Doty and West*

81. Intermediate Shorthand. Continuation of 80. Must be accompanied by Transcription Practice 70. (3; W or S.) *Doty and West*

82. Intermediate Shorthand. Continuation of 81. Must be accompanied by Transcription Practice 71. (3; S.) *Doty*

86. First Quarter Typewriting. For students who have had no previous training in typewriting. Designed to develop a thorough knowledge of the key-

*Required of all who register for Intermediate Shorthand 80, 81, 82.

board and to give practice in the use of the mechanical features of the typewriter. Special attention to the development of typewriting for personal use. (1; F, W or S.) *Doty and Neuberger*

87. **Second Quarter Typewriting. Continuation of 86.** Attention given sentence and paragraph practice and to letter writing. (1; W or S.) *West and Doty*

88. **Third Quarter Typewriting.** Continues with the advanced development of the features given in 86 and 87, and in addition includes tabulating. (1; W or S.) *Neuberger*

89, 90, 91. **Advanced Business Typewriting.** For students who have had one year of typewriting. Fall quarter: Special attention given advanced letter writing, telegrams, invoices and billing, and advanced tabulation. Winter quarter: Advanced legal forms and manuscripts. Spring quarter: Rough drafts, advanced secretarial problems, and care of machines. (1; F. 1; W. 1; S.) *Neuberger*

92. **Ediphone Transcription.** Training in machine transcription, including operation of dictating and shaving machines. Not open to freshmen. Students must arrange for three hours of practice weekly. See instructor before registering. (1; F, W or S.) *West*

94. **Burroughs Calculator.** Practice in addition, multiplication, subtraction, and division on Burroughs calculators and the application of the machine to various business computations such as percentages, discounts, prorating, decimal equivalents, and constants. (2; F, W or S.) *Neuberger and Doty*

96. **Elliott-Fisher Bookkeeping Machine.** Application of the Elliott-Fisher Machine to business and accounting problems. (1-2; F, W or S.) *Neuberger and Doty*

98. **Commercial and Bank Posting.** Practice in the application of the Burroughs posting machine to bookkeeping procedures in commercial and financial institutions and banks. (2; F, W or S.) *Neuberger and Doty*

170. **Statistical Typewriting.** For juniors and seniors majoring in business administration, economics, and secretarial science. Practice will be given in setting up charts, tables and reports. Prerequisite: Sec. Sci. 89, 90 and 91 or equivalent work. (2; F.) *Neuberger*

175. **Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager; types of organization; methods of control; office arrangement and equipment; job analysis; selection, employment, and training of employees. Prerequisites: introductory accounting and general economics. (3; F.) *Neuberger*

*179. **Methods of Teaching Typewriting and Bookkeeping.** Recent developments and practices in the teaching of Typewriting and Bookkeeping. Analysis of objectives, laws of learning, organization of materials, texts, standards of achievement, and methods of presentation. (3) (Not given 1948-49.) *Neuberger*

*180. **The Teaching of Shorthand.** Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3; W.) *West*

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. (3; F. 3; W. 3; S.) *West*

186, 187. **Secretarial Science.** Designed to acquaint students with office routines and procedures and to give practice in quantity production of transcripts and business papers. Includes training in operation of Ediphone. Attention given office conduct and attitudes, personal qualities of a secretary, and the procuring of a position. Prerequisite: Two years of shorthand and typewriting, general economics, introductory accounting, and business communications. (3; W. 3; S.) *West*

*Either (but not both) of these courses may be used as an elective in Education.

189. **Practicum in Business Education.** Provides an opportunity for the planning and development of practical or creative projects in Business Education. Experienced teachers and students, who are registered for teacher training work, are encouraged to build projects around actual school situations. (1-2) *Neuberger*

190. **Seminar in Business Education.** A reading and research course for junior and senior students majoring in business administration and secretarial science. Special reports on current business education problems and literature are made. (2; S.) *Neuberger*

Sociology

JOSEPH A. GEDDES, *Professor*; JOSEPH N. SYMONS, LAWRENCE S. BEE, R. WELLING ROSKELLEY, *Associate Professors*; EVELYN HODGES LEWIS, DON C. CARTER, *Assistant Professors*; HOWARD JESSOP, CARMEN FREDRICKSON, *Instructors*; W. B. PRESTON, H. H. RAMSAY, *Special Lecturers*.

Departmental Objectives:

1. To perform an integrative function. Scientific information on social living has gradually become segregated into separate disciplines known as the social sciences. Each of these sciences at times, and one of them as a normal responsibility, faces the task of integrating the contributions of the others. Sociology, because of the nature of its subject matter, has come to be looked upon generally as having major integrative responsibility. This responsibility is met by offering such courses as Social Change, Modern Social Problems, Rural Sociology, and Courtship and Marriage.

2. To provide for students who become majors, and as many other future citizens as may be interested, the steadily accumulating, tested, basic information dealing with people and groups in relationship. The most basic of this information is found in Principles of Sociology and Rural Sociology.

3. To offer to majors and minors and others whose training warrants, further information and experience, under supervision, in special fields pertaining to relationship. The fields selected for development by the Department have been chosen because of their importance to the people of the state, and particularly to future citizenry. The fields are (1) General Sociology, including research, (2) Family Welfare, (3) Social Change, and Social Disorganization, (4) Rural Welfare, Community Life and Social Institutions.

A dominant purpose is to enable students to become socialized citizens; to aid them to make more satisfactory progress in personality development and to assist them to achieve balance in attitude, in participation and in philosophy of living.

4. Objectives in the Division of Social Work are practical. The aim is to provide preparation for social service in the senior year and more advanced training in one year of graduate study. Students who take social work during the senior year and then take social-work positions may later continue their studies and secure the social work certificate or the masters degree. The aim includes also pre-professional training on the under-graduate level through which a knowledge of rural conditions is secured. This information includes studies of rural standards of living, rural housing, rural means of communication, rural taxation, agricultural prices, rural institutions, rural trends, etc.

MASTER OF SCIENCE DEGREE IN SOCIOLOGY

The Department of Sociology offers work leading to the Master of Science Degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies. Students majoring in Sociology may use the following courses of the 100 series for graduate credit: Sociology 100, 110, 140, 141, 152, 153, 154, 160, 170 and Social Work 173, 177.

The courses above listed may also be used by students in other departments for graduate-credit.

Either Sociology 10 or Sociology 70 is prerequisite for all upper division courses in Sociology; also sociology 40 for 140, 60 for 160, 52 for 152, 87 for Sociology 187 and Social Work 187.

Nuclei courses about which the major and the special group courses should revolve are suggested, as follows:

General Sociology and Research—Sociology 70, 140, 153, 187, 190, 191, 192, 193, 194, 195, 202, 207.

Family Welfare—Sociology 40, 60, 140, 141, 160.

Social Change and Social Disorganization—Sociology 52, 152, 154, 170, 172, 207.

Rural Welfare, Community Life and Social Institutions—Sociology 10, 110, 141, 156, 220; Social Work 240, 214, 222, 275.

10. Rural Sociology. Attempts to provide a groundwork of information which will lead to enlightened rural citizenship and provide a constructive philosophy for living in the country. Concise digests of programs in 25 or more fields are made. Rural social psychology is given emphasis. Conditions in rural Utah are studied. (5; F, W or S.) *Geddes and Roskelley*

40. Social Psychology I. Personality development among different social classes and peoples. Analysis of crowds, publics, social movements and other collective behavior; ideologies and institutions. Prerequisites: Soc. 70 and Psy. 3. (3; W.) *Bee*

44. Women Today. A study of the roles of outstanding women in modern society. (3; F.) *Fredrickson*

52. The Crime Problem. The broader aspects of crime as a serious contemporary problem. Such topics as the extent, nature, causes of, theories concerning, techniques for coping with, programs for prevention, etc., furnish the course content. (3; F.) *Symons*

60. Courtship, Marriage and the Family. Designed to help unmarried and married students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. (3; F, W or S.) *Bee*

70. Principles of Sociology. The foundations of Sociology are studied in order that a plan of social progress may be formulated. The problems of social origins, social structures, public opinion, social activities, social organization, and social evolution are considered. Prerequisite for all Upper Division classes. (5; F, W or S.) *Staff*

87. Elementary Social Statistics. Techniques of using statistical method in studying social problems with emphasis upon logical methods of collection, tabulation, graphic portrayal, averages, dispersion, reliability, elementary sampling and simple correlation with brief consideration of the theoretical implications. Majors in Sociology and Social Work should take this course. (3; F.) *Roskelley*

100. Educational Sociology. The influence of the social processes and social changes on school curricula, objectives and teachers. It includes an appraisal of educational goals in the light of present social needs. (3; F.) *Staff*

110. Utah Social Problems. Problems dealing with present conditions in fields such as population, migration, housing, insurance, manufacturing, temperance, safety, etc., are studied and analyzed. (3; W.) *Geddes*

130. Introduction to Cultural Anthropology. Treatment of the attitudes, ideas, behavior, basic personality organization, and material results of selected primitive and contemporary cultures. (3; F.) *Bee*

140. Social Psychology II. Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: Soc. 40. (S) *Bee*

141. Rural Community Organization and Leadership. The growth of the natural community and forces which under leadership are gradually transforming collective effort in rural areas. (3; S.) *Roskelley*

152. Organized Crime. Criminal behavior is becoming more thoroughly organized. As such it has historical backgrounds and a natural history in the U. S. The organization, the fields most organized, and counteracting techniques are the concern of the course. Prerequisites: Soc. 52 and 170, or Instructor's approval. (3; S.) *Symons*

153. History of Social Thought. The emergence and development of social thought from early periods is traced to August Comte. From this point import-

ant developments in Europe and America are studied. Particular emphasis is given to the American field. For majors and minors in Sociology. Others on instructor's approval. (5; S.) *Symons*

154. **Population Problems.** Distribution, characteristics, and trends in the population. Special attention given an analysis of Utah population trends. (3; S.) *Roskelley*

156. **Social Institutions.** Similarities and differences in the life histories of institutions as they emerge, grow and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. (3; W.) *Geddes*

160. **Family Relations.** The social-emotional development of the child in the family. Material adjustment; social-cultural difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60. (3; S.) *Bee*

170. **Juvenile Delinquency.** The causes of delinquency are considered with the purpose of arriving at intelligent remedies. Various methods of home, social, and institutional treatment are studied; parental cooperation, personal supervision allied with probation and parole, institutional treatment, etc. Prerequisite: Soc. 52. (3; W.) *Symons*

172. **Poverty and Dependency.** The extent of poverty, its causes, remedies now in use, and others which give promise. Social methods of caring for dependents are examined. Emphasis on programs which look to prevention and to minimization as well as to adequate care. (3; F.) *Staff*

180, 181, 182. **Current Sociological Problems.** For upper division and graduate students. (1; F. 1; W. 1; S.) *Staff*

187. **Research Methods in Sociology.** An advanced course in Methods of Social Research. Soc. 87 or Math 111. (3; W.) *Geddes*

190, 191, 192, 193, 194, 195. **Seminar in Sociology.** Time arranged. Six quarters required for majors in Sociology. (1; F. 1; W. 1; S.) *Staff*

201. **Research in Sociology.** For advanced students only. A project is organized and field work is carried on under supervision. Original studies are made. Prerequisite: Soc. 70, 87 or Math. 111. (F, W or S.) *Staff*

202. **The Study of Society.** Sociological theory. Sociology is studied as a classified body of facts and as a method of investigation. (5; S.) *Geddes*

207. **Graduate Seminar.** Short subjects falling within the field of Sociology and pertinent to it but not available in regular courses are selected for study. (2; W.) *Staff*

220. **Rural Organization.** Social organization in small towns, villages and open country. Required for students training for rural social work. (2; S.) *Geddes*

Social Work

Division of Social Work

JOSEPH A. GEDDES, *Director*; DON C. CARTER, *Assistant Director*.

An integrated five-year plan of study is offered which includes an undergraduate major in Social Work and a Social Work Certificate on successful completion of one year of graduate work.

A major in social work at the college may be secured through completion of:

1. 6 credits in Physical Education or Military Science
2. College group requirements
3. Background courses in the social sciences and in related fields to include:
 - 8 credits in Psychology
 - 8 credits in Political Science
 - 8 credits in Economics or Agricultural Economics
 - 8 credits in Public Health or Home Economics
 - 8 credits in Sociology
 - 8 credits in History

4. 30 or more credits selected from the following:

		Cr. Hrs.
C.D. 60	Child Development	3-5
Psy. 103 a & b.	Clinical Psychology	8
Soc. 110	Utah Social Problems	3
Soc. 140	Social Psychology	3
Ec. 147	Social Security	3
S.W. 162	Mental Hygiene	3
Soc. 170	Juvenile Delinquency	3
S.W. 173	The Field of Social Work	3
S.W. 174	Introduction of Case Work	3
S.W. 175	Introduction of Field Work	3
S.W. 177	Social Treatment of Children's Problems	3
S.W. 187	Methods of Social Research	3
S.W. 195	Social Work Seminar	1
Total		44

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:

		Cr. Hrs.
S.W. 200	Principles of Social Case Work I	3
S.W. 201	Principles of Social Case Work II	3
S.W. 210	Field Work I	4
S.W. 211	Field Work II	4
S.W. 212	Field Work III	2-4
S.W. 214	Field Work IV — Group Work	2
S.W. 222	Social Work in Rural Communities	2
S.W. 230	Social Psychiatry I	2
S.W. 231	Social Psychiatry II	2
S.W. 240	Community Organization	3
S.W. 250	Public Welfare Services	3
S.W. 260	Medical Information	3
S.W. 270	Child Welfare	3
S.W. 272	Foster Home Care of Children	3
S.W. 275	Principles of Group Work	3
S.W. 276	Contemporary Social Work Literature	2
S.W. 180	Social Security Administration	3
S.W. 182-282	Children in Institutions	3
S.W. 187	Research Methods in Sociology and Social Work	3
S.W. 295-296	Social Work Seminar	1-2

162. **Mental Hygiene.** Social and cultural changes that have given rise to problems of adjustment. Reactions to stress; "preventive" growth and adaptation. (3; S.) *Bee*

173. **The Field of Social Work.** The historical development of social work in England and America, including the evolution of the theory underlying the modern social work movement. Designed for students entering teaching, home demonstration or county agent's work, as well as social work. (3; F.) *Staff*

174. **Introduction to Case Work.** Introductory information dealing with the nature of case work, its historical development, and its acceptance in diverse fields is considered. (3; W.) *Lewis*

175. **Introduction to Field Work.** To acquaint the student with sources of income, organization of personnel and resources, equipment available, and control devices under which the more important social agencies operate. (3; W.) *Jessop*

177. **Social Treatment of Children's Problems.** Analysis, investigation, and treatment of the problems of children. (3; F.) *Carter*

182-282. **Children in Institutions.** A study of institutions maintained for dependent or neglected children. (3; S.) *Carter*

- 187-287. **Methods of Social Research.** Technique of defining the problems, developing schedules, interviewing and analyzing sources of material. Majors in Sociology and Social Work should take this course. (3; W.) *Geddes*
195. **Social Work Seminar.** For seniors majoring in Social Work. (1; S.) *Staff*
200. **Principles of Social Work I.** Principles and methods of modern family case work. Investigation, diagnosis and treatment of economic, medical and conduct problems are studied. (3; F.) *Lewis*
201. **Principles of Social Case Work II.** A continuation of S.W. 200. Interviewing, recording and treatment are stressed. (3; W.) *Lewis*
210. **Field Work I.** Field work centers will be maintained in selected public and private agencies and supervision will be provided under college direction. S.W. 200 should precede or be taken concurrently. (2-3-4; F or W.) *Jessop*
211. **Field Work II.** A continuation of Field Work I. (2-4; W or S.) *Jessop*
212. **Field Work III.** A continuation of Field Work II. S.W. 200, 201 are prerequisites. (2; S.) *Jessop*
214. **Field Work in Group Work.** A limited amount of leadership training and observation of groups in action is available to students who have completed Social Work 275. (2; S.) *Staff*
222. **Social Work in Rural Communities.** Social work in relation to problems of organization, administration and community relations, particularly as they affect rural counties. (2; S.) *Staff*
230. **Social Psychiatry I.** Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; the interrelation of physical, emotional, mental and environment factors are stressed. (2; F.) *Ramsay*
231. **Social Psychiatry II.** An advanced course open only to students of work who have had S.W. 230. (2; W.) *Bee*
240. **Community Organization.** Processes operating in rural and urban communities and development of means for coordinating them. (3; W.) *Geddes*
250. **Public Welfare Services.** The history and methods of public administration in state and county public welfare activities. (3; W.) *Staff*
260. **Medical Information.** Diseases most frequently encountered in social work. The interrelations of disease and social conditions are appraised. Medical resources are considered. Open to social work students in the senior year. (3; S.) *Preston*
270. **Child Welfare.** Programs for meeting the needs of children. Consideration is given to parental rights as evidenced in child labor laws, the Juvenile Courts, aid to dependent children, the changing status of the illegitimate child, and public organization for more effective administration of laws relating to child dependency, delinquency, neglect, and handicapped children. (3; W.) *Jessop*
272. **Foster Home Care of Children.** Substitute parental care, placement and supervision of children in foster homes, including day care, boarding care, and adoption. (3; S.) *Lewis*
275. **Principles of Social Group Work.** Principles of group participation, of leadership and followership. Personality adjustments and therapeutic values in social group work. (3; S.) *Carter*
276. **Contemporary Social Work Literature.** Attempts to review current contributions to the various fields of social work literature as well as to acquaint the student with the character of the periodical literature that has been published during the previous year. (2; W.) *Staff*
280. **Social Security Administration.** Objectives of social security in relation to the social organization through which its administration is achieved. Plans for improvement and expansion are considered. (3; S.) *Carter*
- 295, 296. **Seminar in Social Work.** For advanced students in the Division of Social Work. Newer trends are considered in interviewing, recording, and treatment in the case work field. (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 comprises the departments of Art, Educational Administration, Elementary Education, Library Science, Music, Physical Education and Recreation, Psychology, and Secondary Education. A major function of these departments is the preparation of teachers for elementary and secondary schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments of the College.

The Bachelor of Science degree with a major in Education is designed primarily for those students who are preparing to teach in elementary schools, or for those who desire to meet requirements for administrative or supervisory credentials. Although provision is made for a major in secondary education, students preparing to teach in the secondary schools will usually find it advisable to take their Bachelor's degree in the particular school in which their major work is chosen. Arrangements have been made with the different schools of the College to provide the candidates for their respective degrees with the necessary professional courses to qualify them to teach in these fields. Requirements for a teaching major are set forth by the various departments.

The School of Education stands firmly on the principle that teachers must not only be liberally educated but be thoroughly prepared in the subjects which they are to teach.

For teachers in junior and senior high schools it is intended that the student shall be prepared to teach in two high school teaching fields. The student's mastery of essential subject matter in the teaching field, rather than the credit hours, should operate in determining subject matter proficiency. Teaching fields should be chosen by the student on basis of his individual abilities and interests and also in the light of available information concerning the demands for beginning teachers and the supply in the respective fields. The curriculum in professional education and psychology aims to impart to prospective teachers the meaning of education in its relation to desirable social objectives, the organization and administration of schools in relation to the needs of the learner and to social aims, an understanding of the nature and needs of the learner and the learning process, and by means of certain technical courses in education, to develop skills in the art of teaching.

The sequence of professional courses in Psychology and Education is such that it is necessary to study in these fields before the final year. A detailed plan of study is not outlined or prescribed. The student who plans to prepare for teaching will usually find it advantageous to devote the first two years to securing a well-balanced general education, giving some attention to courses prerequisite to advanced study. During these years some emphasis may also be placed in the field of specialization. The third and fourth years should be devoted primarily to concentration in the major field of study and to professional subjects in Psychology and Education.

For requirements for admission, certification, and graduation, see pages ... to ...

TEACHER PLACEMENT SERVICE

The College is interested in placing qualified teachers in teaching positions. To accomplish this purpose the teacher placement service has been organized. All students who qualify for teaching certificates are expected and urged to register with the bureau to facilitate the completion of the proper credentials to be used in placement for the current and future years. Registration should be completed during the winter quarter and early part of the spring quarter.

TEACHER CERTIFICATION

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements so far as regular students of the College are concerned.

The certification standards conform as nearly as may be to the requirements of the State Board of Education. With the Bachelor's degree the student may qualify for any one of the following certificates:

- 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
- Certificate for Teachers of Home Making in Secondary School
- Two-year Certificate for Secondary School Teachers of Industrial Arts

Specific requirements for each certificate are listed with the departments in which the major work is offered.

TEACHER TRAINING

The College offers complete programs of teacher training in all phases of public school work. Facilities for practice teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Child Development in the School of Home Economics, is concerned particularly with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts, and Technology do their practice teaching under the direction of the departments concerned in selected schools throughout the state.

For the training of kindergarten and general elementary teachers the College maintains the Whittier School, one of the elementary schools of Logan City, which includes the kindergarten and grades one to six inclusive. The teachers in the school, selected particularly for their fitness to serve on the teacher education program, are regular members of the College faculty. The training school, in addition to its function as a center for teacher education, serves the School of Education as a laboratory in which child growth and development are studied and desirable school practices are developed.

By special arrangement with the local board of education the facilities of the Logan Junior High School and Logan Senior High School are utilized as student teaching centers in secondary education. Each school has an enrollment of approximately 700 pupils. Thus both schools are able to offer a well balanced schedule of classes and a comprehensive program of student activities, all of which are available for cooperative use in teacher education. Arrangements are made for training in other schools as needed.

Art

FLOYD V. CORNABY, *Professor*; CALVIN FLETCHER, *Professor Emeritus*; H. REUBEN REYNOLDS, *Professor*; JESSIE LARSEN, EVERETT THORPE, *Assistant Professors*; DEVAUN ZUFELT, *Instructor*.

The Art Department is adequately prepared to offer major or minor study with specialization in the fields of Art Education, Commercial Art, Fashion Drawing and Illustration, General Illustration, Photography, Painting, Sculpture, Interior Decoration, Industrial Design, and Crafts suitable for teaching, recreation, hobbies and occupational therapy.

The Art Department is also closely correlated with Home Economics, Industrial Arts, Commerce and other major divisions of the College as well as with the School of Education.

Majors. Majors may specialize in any of the above fields on the following conditions: They must show aptitude for the work and submit at least 30 credits in the elected field in addition to Art 1, 2, 32, 124, 125, 126, 127, 128, 133.

Teaching majors in secondary Art Education must complete Art 1, 2, 3, 7, 10, 32, 123, 124, 125, 126 or 133, 127, 151, ten credits in painting, and ten credits in crafts.

Teaching majors in elementary grade supervision or special teaching of drawing, handwork, or creative expression must complete Art 1, 2, 3, 10, 32, 104, 123, 124, 125, 152, ten credits in painting, and ten credits in crafts (in at least four different lines).

Minors. Education majors in secondary education desiring an art teaching minor should take Art 1, 2, 3 or 133, 7, 10, 32, 104, 124, 125, 151, four credits in painting and four credits in crafts.

Textiles majors desiring a teaching minor in Art should take Art 104, 111, 127, 135, 151 and four credits in crafts.

Majors in Elementary Education who elect Art as a specialization field should take Art 1, 2, 7, 10, 104, 124, 125, three credits Art Appreciation, four credits painting, four credits crafts.

For any desired specialization not covered above, please refer to Art 171 and consult the head of the department.

The following courses may be repeated for additional credit: Art 104, 106, 108, 109, 110, 112, 113, 114, 117, 118, 130, 135, 171.

Structure and Organization—Design

1. Art Structure and Design. Creative approach to line, mass form, pattern, texture, color, and their combined relationship to design construction. (3; F, W or S.) Sections limited to 20 students. *Staff*

2. Design Creation and Application. Problems in creating designs and applying them to specific projects. Instruction is adapted to the individual, satisfying the needs of teacher, homemaker, hobbyist, or scout, summer camp and recreational counselors. (3; F, W or S.) Prerequisite: Art 1. *Staff*

7. Freehand Drawing. Objective drawing of natural forms from observation and memory in various media. A desirable prerequisite to all painting courses. (2; F or S.) *Thorpe*

4-104. Creative Expression. Studio experience in developing spontaneous expression and freedom of graphic interpretation. Excellent for the layman who thinks that he cannot express himself artistically, but who has a desire to do so. For art majors who find it difficult to interpret their inner ideas. (2; W or S.) *Larsen*

111. Fabric Design and Application. Designing of textiles, wallpaper, rugs, embroidery and related ornamentation. Projects applied in techniques of block print, stenciling, silk screen. (2; F or S.) *Larsen*

23-123. Interior Decoration. Design and color as applied to the furnishing and decoration of interiors. Studying style trends and proper selection of furniture, drapery, rugs, lighting fixtures, wall coverings and accessories for the creation of interiors of character and beauty. Prerequisites: Art 1 and 2. (5; F or S.) *Larsen*

124. Perspective Architectural and Landscape Rendering. The principles of cylindrical, parallel, oblique and modernistic perspective as used in the arts. Suited to the needs of students of art and landscape architecture. Rendering in pencil, pen and ink, wash and color. (3; F or S.) *Fletcher*

125. Anatomy. Artistic approach to the drawing of human and animal anatomy. (2; S.) *Fletcher*

127. Advanced Design. Special problems in creating designs for furniture, leather, art metal, jewelry, ceramics, textiles, plastics, and mural decoration. Adapted to the needs of teachers, industrial artists, craftsmen. (3; W.) *Cornaby*

128. Figure Drawing. The construction of the human figure. Adapted to the needs of fashion artists, sculptors, painters, illustrators, commercial artists, and teachers. (2; W.) *Thorpe*

Appreciation

3. Art Understanding and Appreciation. Aims to increase enjoyment of living through the sense of sight. Develops understanding of the basic principles underlying architecture, landscape gardening, interior decoration, sculpture, painting, ceramics and other visible forms of art in everyday life. (3; F.) *Reynolds*

26-126. History and Appreciation of Architecture. The characteristics of the great styles of building and the development of a state for good architecture. Adapted to the needs of the homemaker, teacher, artist or layman. (3; W.)
Reynolds

32-132. Color. Color as used in stage lighting, painting, design, and everyday life. Its physical, psychological and artistic phases are correlated. Suited to the businessman, layman, dramatist, artist, teacher and painter alike. (3; S.)
Reynolds

33-133. History and Appreciation of Painting. Designed for the layman desiring to extend his knowledge of the great painters as well as for the teachers of art and artists. (3; S.)
Reynolds

Crafts

106. Sculpture. Modeling and casting and carving in various media. (2; F, W or S.)
Zufelt

112. Ceramics. Art of making pottery, tiles, figurines, etc.
Staff

113. Art Metal, Jewelry and Lapidary. Art metal projects in hand-wrought copper, brass, pewter and silver, jewelry design and constructions, precision casting. (2; F, W or S.)
Cornaby

114. Leathercraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of molding, carving, stamping, embossing, etc. (2; F or S.)
Cornaby

118. Plastics. Creative use of plastics as an ornamental craft. (2; W.)
Cornaby

Commercial Art

10, 110. Lettering-Layout. Design in advertising, display, layout, lettering, etc. (3; F, W or S.)
Thorpe

135. Commercial Illustration. Costume design, advertising. (3; F, W or S.)
Thorpe

Photography

129. Photography. Basic course in use of cameras, light meters, lighting apparatus, contact printing, enlarging, slide making and related work. (3; F, W or S.)
Reynolds

130. Advanced Photography. Fall, landscape and architectural. Winter, portrait, commercial and advertising. Spring, landscape and abstract composition. Prerequisite: 129. (3; F, W or S.)
Reynolds

Art Education

34. Art for Young Children. Designed to meet the needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3; W.)
Fletcher

152. Art Methods for Elementary Grades. Methods of teaching drawing, painting, design and handwork in the elementary schools. A "must" in preparation of a grade school teacher. Prerequisite: Art 1 and 2. (3; W.)
Larsen

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts. Required of all majors and minors in art on secondary teaching level. Prerequisites: Art 1, 2. (3; F.)
Staff

Painting

8-108. Oil Painting. Introduction to the use of oil paint as an art media, emphasis on various techniques. Desirable prerequisite: Art 7. (2; F, W or S.)
Fletcher

109. Watercolor Painting. Modern techniques. Introduction to impressionism. Desirable prerequisite: Art 7. (2; F, W or S.)
Cornaby

117. Portrait Painting. Drawing, illustrating and painting of portraits in various media. (2; S.)
Thorpe

171. Special Studio Courses. Individual work on specific problems. This is a service course to all departments. However, art majors desiring work in Art 171 are required to take Art 1 and Art 2 as prerequisites. All criticisms, assignments and supervision are given on Fridays at a time arranged between student and head of department. In some instances several instructors may be called in on the same project.

From one to five credits a quarter may be taken.

Cornaby: Art metal, jewelry, lapidary, precision casting, leathercraft, ornamental plastics, industrial design, watercolor.

Fletcher: Etching, wood engraving, monotype or lithographic drawing, scientific drawing, oil painting, watercolor, perspective, pen and ink illustration, architectural and landscape rendering, problems in art education for nursery, elementary and secondary grades.

Reynolds: Photography, puppetry, art appreciation, architecture, interior decoration, color, design.

Larsen: Design, interior decoration, textiles, silk-screen processing, stenciling, block printing, weaving.

Thorpe: Commercial art, fashion drawing, illustration, portrait painting, design, advertising display, figure drawing, anatomical drawing.

Zufelt: Sculpture, modeling, ceramics.

EDUCATIONAL ADMINISTRATION

E. A. JACOBSEN, *Chairman*

E. A. JACOBSEN, JOHN C. CARLISLE, L. R. HUMPHERYS, *Professors*; L. G. NOBLE, *Associate Professor*; C. E. MCCLELLAN, *Professor Emeritus*.

114. Organization and Administration. Fundamental principles of organization and administration of schools in the American public school system with emphasis on Utah conditions. (3; F or W.) *Jacobsen*

116. Articulation of the Educational Program. A survey of existing needs for close articulation of the various educational units and agencies. Discussion of the factors conditioning nature and extent of articulation and of the unifying principles upon which a well articulated education program rests. (3; F 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. (3; W.) *Noble*

181. School Finance. A study of the important of finances in a school system and the principles and practices involved in the collecting and distributing of school revenues, with special reference to the conditions in Utah. (2; F.) *Jacobsen*

190, 191, 192. Intercultural Education. A sequence of courses planned in cooperation with other departments on the campus to acquaint the prospective teacher with ways and means of studying in the elementary and secondary schools the culture of other peoples. (1; F. 1; W. 1; S.) *Staff*

201. Background of Modern Education. An integration of the history and philosophy of education as a basis for understanding modern education. The evolution of educational thought, the sources of great philosophies of education in relation to their times. (5; F.) *Noble*

203. Evaluating the Elementary School. Studies evaluating the changing elementary school are analyzed. Particular attention is given to organization and curriculum. Newer methods utilized in evaluation are considered. Enrollment open only to experienced teachers or prospective teachers who have completed their courses in student teaching. (3; W.) *Carlisle*

205. Reading and Conference. Provides for individually directed study in the fields of one's special interest and preparation. (1-2; F, W or S.) *Staff*

211. Educational Measurement and Statistics. The fundamental principles of measurement tests and test construction, statistical analysis, and evaluation procedures in education. (5; W.) *Humpherys*

219. The Principal and His School. Practical problems confronting the principal in administration and supervision, in terms of the changing social scene and changing concepts of school administration. Problems of administration, supervision, curriculum, pupil personnel, school-community relations, as they apply to the work of the principal all are given consideration. (3; W.)
Carlisle

221. Advanced School Administration. A general study of the work of the school administrator and the principles upon which the profession of school administration is founded and efficiently practiced. Consideration is given major educational problems with which the school administrator is confronted. (3; S.)
Jacobsen

230. School Supervision. The principles and practices of school supervision including the qualifications and responsibilities of the supervisor. (3) *Carlisle*

237-8-9. Educational Seminar. Gives opportunity for the investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. (1; F, W or S.)
Staff

267. Introduction to Research. An inquiry into the nature and sources of research problems with a study of underlying principles and methods of working out such problems in education. Some attention is given thesis writing as a problem related to research. (2; W.)
McClellan

271. Research and Thesis Writing. Provides for individual work in thesis writing with the necessary guidance and criticism. (F, W or S.)
Staff

ELEMENTARY EDUCATION

....., *Chairman*

....., EDITH SHAW, EDITH BOWEN, *Assistant Professors*; ELLEN HUMPHERY, FERN NICHOLS, MYRTLE JENSEN, LARUE PARKINSON, ALICE CHASE, FAYE H. GIDDINGS, HAZEL C. CLARK, *Instructors*.

In addition to the general requirements for the Bachelor of Science degree, the following requirements must be met:

- (1) Courses designed to provide a broad liberal background. These must include ten credits in each of the four basic fields of knowledge: social sciences, biological sciences, physical sciences and mathematics, and language arts; and six credits in fine and practical arts.
- (2) Thirty credits in one field of concentration or 18 credits in each of two such fields.
- (3) A major of 45 credits in professional study selected from the following divisions:
 - Group I. Understanding the Child—Minimum 9 credits:
Psychology 110, 103, 130, 145, Physical Education 84, Public Health 155, Speech 107, Child Development 60.
 - Group II. Understanding the School—Minimum 6 credits:
Education 103, 114, 116, 141, 201.
 - Group III. Curriculum and Methods—Minimum 12 credits:
Education 104, 105, 107, 108, 161, Psychology 112, 107, English 24, Speech 18, Music 130, Art 152, Physical Education 177, 182, Child Development 175A.
 - Group IV. Student Teaching—Minimum 12 credits:
Education 106, Child Development 175b.
 - Group V. Electives—may apply on 45-credit major:
Psychology 120, 140, 102b, Education 110, 145, 165, 181, 194, 203, 205, 211, 219, 221, 237-8-9.

Selection of the program of study should be under the guidance of the major professor. Completion of a major in Elementary Education includes all requirements for a Utah general elementary certificate.

103. Principles of Elementary Education. Aims, functions, work and attainable goals of the elementary school as an integral part of the American system of education; its relations with the community and the other schools of the American series. Part of the work of the course will be devoted to observation and analysis of practices and procedures in selected elementary schools within the vicinity of the College. Two hours of observation weekly. Time arranged. (4; F or S.) *Staff*

104. Elementary School Curriculum. Designed to familiarize prospective elementary teachers with the content of the elementary curriculum, the objectives and standards to be realized in the grades, and to extend the student's scholarship in the various fields explored by pupils of the elementary school. (3; F or W.) *Bowen*

105. Principles of Teaching in Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. The purpose and meaning of subject matter in light of the foregoing thesis. Significance of the fact of individual differences in its application to schoolroom practices. Consideration of schoolroom equipment and of organization and play activity. (3; F, 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 responsibility but with gradual increase of work and responsibility as trainee's ability is demonstrated. Registration for all quarters should be arranged for at the time of fall 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. The Teaching of Reading. Objectives, standard of attainment and methods of reading instruction; diagnostic and remedial techniques at the elementary and secondary level; reading in the activity program. (3; W.) *Bowen*

108. Social Studies in the Public School. Social responsibilities and opportunities of children and youth in the present and postwar world. The part that should be played by the school and the teacher in helping boys and girls to meet these problems will be studied. This will deal with both content and methods in social studies for the public schools. (3; F.) *Staff*

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. (2; S.) *Staff*

145. Safety Education. Emphasizes (a) the needs for safety education in the modern world; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions, and readings, stressing various aspects of safety and directed by safety specialists from many areas. (2; F or S.) *McClellan*

165. Rural Education. Major problems of rural life as they relate to education. The adaptation of general educational objectives to rural conditions, especially as they pertain to Utah. The organization of rural schools, the course of study, and methods in education suited particularly to the rural school problems on both elementary and secondary levels. (2; W.) *Jacobsen*

LIBRARY SCIENCE

KING HENDRICKS, *Chairman*

Library Science may be used as a teaching major or minor in connection with a major in Education. This course prepares the student for a librarian certificate as issued by the Utah State Board of Education and for a position as school librarian on the elementary or secondary level. It also provides background for advanced training in librarianship. A teaching major of not less than 30 credits or a minor of not less than 18 credits must represent credits selected from each of three groups of courses including courses marked *.

- Group 1: Technical processes 113, 120*; Eng. 111; Educ. 161; Art 110.
 Group 2: Use of the Library 1, 100*, 155*, 160; Eng. 24, 40, 52, 60; Speech 18; Educ. 107.
 Group 3: Administration 150*; Educ. 104, 105; Psychology 110.

1. The Use of the Library. A general course designed to help students to become efficient in using books and libraries. Emphasis will be placed upon use of card catalog, periodical indexes, and reference books. (2; F, W or S.)

Staff

100. Reference Materials and Bibliography. A continuation of work done in *The Use of the Library*, which course is a prerequisite to this one. Principal reference tools in each field are studied. (3; W.)

Staff

113. Book Repair and Binding. Methods of book repair, necessary bindery records, and the history of book binding. (2; S.)

Staff

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. (3; F.)

Staff

121. Second Quarter Cataloging and Classification. A continuation of the work undertaken in Library Science 102 which is a prerequisite to this course. (3; W.)

Staff

150. School Library Administration. The theory of school library work with emphasis on demonstration and practical application. (3; S.)

Staff

155. Book Selection. Methods and principles of book selection and book ordering. (3; F.)

Staff

160. The Art of the Book. The history of bookmaking and printing. (1) *Staff*

MUSIC

N. WOODRUFF CHRISTIANSEN, *Professor, Chairman, Instrumental Division*;
 WALTER WELTI, *Professor, Chairman, Vocal Division*;
 GEORGE PAHTZ,, *Instructors*

Courses in the Music Department are designed to (a) serve the general cultural needs of all students, (b) meet the major and minor requirements of prospective teachers.

The department is also a valuable service department; individuals, groups, and organizations fill a constant and urgent need in the neighboring schools and communities. Arrangements for this service are made largely through the Alpha Eta Mu musical fraternity, a campus organization.

Music 1, 4, 5, 11, 12, 13, 80, 81, 89, may be used for Lower Division group requirements. (See page) Any courses in Music meet state certification requirements.

Vocal Music Major. For this major the following courses are required: Music 1, 4, 5, 11, 12, 13, 106, 114, 121, 122, 123, 124, 125, 126, 130. Majors are required to present a creditable solo recital in the junior or senior year, as prescribed by the major professor; also to play third grade piano music at sight. The following allied subjects are recommended: Oral Expression, Creative Dancing, a year of foreign language. Modern Language 21, 22 and 23 are required except of students already trained in them. (See Modern Languages 21, 22, 23.)

Instrumental Music Major. To complete this major with recommendation to teach band and orchestra the following courses are required: Music 11, 12, 13, 72, 80, (81, 87, 89 choice of two) 106, 10 or 110, 111, 112, 113, 114, 121, 122, 123, 133, 134, three or more quarters of symphony orchestra and six or more quarters of band as prescribed by the major professor, at least three quarters of piano, private instruction or equivalent on a band or orchestral instrument sufficient for a creditable solo performance, one quarter each private instruction or equivalent on a string instrument, a brass instrument, and a woodwind instrument.

Piano Major. The following courses are required for this major: Music 11, 12, 13, 106, 110, 111, 112, 113, 133, 134, one quarter of chorus, one quarter of ensemble (music 15, 16, or 17), one appreciation course (music 80, 81, 87 or 89), and 18 credits in piano.

In 1936 the College was awarded a complete Carnegie music set containing 2,000 recordings, 150 bound scores, and 100 selected books on music. This material, together with many additions made since that time, is available to students and is used in the music courses.

1. **The Art of Listening.** Designed to enhance the general listener's appreciation of music through the use of selected reproductions; though non-technical, collateral reading and reports will be assigned. (3; F.) *Wolti*

4. **Sight Singing.** Notation, scales, intervals and keys in major and minor modes, and their applied use in reading music. (3; F.) *Wolti*

5. **Dictation.** Translating musical sounds into written notation. Writing melodies, intervals and chords from dictation. Prerequisite: Music 4 or equivalent. (3; W.) *Wolti*

7, 8, 9. **Elementary Class Piano Instruction.** For students without previous work in piano. General keyboard facility. Sight reading of folk tunes and the easier classics; harmonizing melodies by ear. Limited to prospective teachers in the elementary schools and to music majors. (1½; F, W or S.) *Staff*

10. **Keyboard Harmony for Non-Pianists.** Practical keyboard use of the materials of harmony in harmonizing melodies, improvisation, modulation, and transposition. Prerequisite: harmony 11, 12. (3; S.) *Staff*

110. **Keyboard Harmony for Pianists.** Same as keyboard harmony 10 but a higher degree of proficiency required. Prerequisites: Harmony 11, 12; third grade pianistic ability or Music 10. (3; S.) *Staff*

11, 12, 13. **Harmony.** Prerequisite: Familiarity with the piano keyboard. Chord structure and progressions, to and including modulations, melody writing and musical analysis. (3; F, W or S.) *Staff*

15, 16, 17 or 115, 116, 117. **String Ensemble.** Composed of capable string players performing as a group. Music specially arranged for a large string group will be used. (1½; F, W or 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. (1½; F, W or S.) *Christiansen*

21, 22, 23 or 121, 122, 123. **String Groups (trio, quartets).** Offers opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Standard literature will be studied. (½-1; F. ½-1; W. ½-1; S.) *Pahtz*

24, 25, 26. **Men's Chorus.** Open to all men students with a normal singing voice. Auditions to determine the part you sing will be announced at rehearsal. Men and women join in mixed chorus work each Friday. Auditions are required before registering in the Winter quarter only. One credit each quarter. 25 is for Winter quarter only and carries 2 credits. *Wolti*

27, 28, 29. **Ladies Chorus.** Open to all women students with a normal singing voice. Auditions to determine the part you sing will be announced at rehearsal. Women and men join in mixed chorus work each Friday. Auditions are required before registering in the Winter quarter only. One credit each quarter. 28 is for Winter quarter only and carries 2 credits. *Wolti*

35, 36, 37. **Vocal Groups.** Offers an opportunity for good voices to organize into trios, quartets, and other small units. See instructor before registering. (1; F. 1; W. 1; S.) *Wolti*

38. **Music for Little Children.** Methods of procedure in teaching music to children of pre-school age. (1; F.) *Wolti*

41, 42, 43 or 141, 142, 143. **Band.** This organization is the college concert band. Concerts will be given and music furnished for athletic events. Students below junior standing register for 41, 42, 43. Students able to attend only three rehearsals per week should register for one credit only. (2; F. 2; W. 2; S.) *Christiansen*

44, 45, 46. **Brass and Reed Groups.** Brass quartets, sextets, and woodwind quartets. Members will be selected from applicants. (½; F. ½; W. ½; S.) *Christiansen*

47, 48, 49. **Composition and Analysis.** Practical composition in the small forms from the extended period to the song form with trio. Prerequisite: At least one year of harmony. (2; F. 2; W. 2; S.) *Staff*

72. **Principles of Singing.** A study of vocal functions, causes of poor tone production, and means of correction. Results are measured through individual and ensemble singing in class. Recommended for teachers. (2; S.) *Wolti*

80. **Opera Appreciation.** An intensive study is made of the world's best operas. Particular attention is given to the development of the orchestra as an essential part of the opera. By means of recordings the choicest musical selections are learned. (2; F or S.) *Christiansen*

81. **Symphony Appreciation.** Complete symphonies are given by the use of recordings. A careful study is made of their form and content. Biographical sketches of composers. (2; W.) *Christiansen*

87. **Musical Literature for String Instruments.** A non-technical course. Through recordings a study is made of standard concerts, trios, quartets and quintets. Biographical sketches of composers and performers. (2; F, W or S.) *Pahtz*

89. **Bach, Beethoven and Brahms.** Their lives and works, their influence upon the development of music and the influence upon their music of the times in which they lived. (2; S.) *Staff*

93, 94, 95 or 193, 194, 195. **Symphony Orchestra — Sectional Training.** Provides training in phrasing, counting, and sight-reading symphonic works. (a) string section, (b) woodwind section, (c) brass section. ($\frac{1}{2}$; F. $\frac{1}{2}$; W. $\frac{1}{2}$; S.) *Pahtz*

106. **History of Music.** The development of music from its varied inceptions to the present. Lives of the most prominent composers. Effects of history on the development of music. (3; F.) *Wolti*

111, 112, 113. **Advanced Harmony.** Prerequisite: Music 11, 12, 13. Modulation, embellishing chords, inharmonic embellishments and figurations, analysis. (3; F. 3; W. 3; S.) *Staff*

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. (3; S.) *Wolti*

117. **Opera Production.** A thorough study of the details involved in the production of opera. Students are assigned definite responsibilities in the preparation and presentation of opera. Consult instructor before registering. (2; W.) *Wolti*

121, 122, 123. **Band and Orchestra Methods.** A study of the various instruments and the essential points in the teaching of them. Designed for students who may teach bands or orchestras or for general musical background. To precede student teaching. Fall, brass and percussion instruments; winter, woodwind instruments; spring, string instruments. (3; F. 3; W. 3; S.) *Christiansen*

124, 125, 126. **Chorus.** Upper division students who have had choral experience may register for chorus under these numbers. 125 is for winter quarter only, and carries two credits. *Wolti*

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 begins immediately after these selections are completed. (3; W.) *Wolti*

130. **School Music Methods.** Methods of teaching music in the grades. Prerequisites: Music 4 and 5, or Music 11 and 12. No exceptions made to this rule. (3; S.) *Wolti*

133. **Counterpoint.** Prerequisite: Harmony 13. Strict contrapuntal composition in all five species, in two, three, and four parts. (3; F.) *Staff*

134. **Counterpoint.** Strict and free counterpoint; a study of inventions and their composition. (3; W.) *Staff*

135, 136, 137. **Vocal Ensemble.** Open only to members of the Chansonette and Meistersinger choruses. Membership in these choruses is limited and competitive. Application may be made at any time, but auditions will be announced only as vacancies occur. (1; F. 1; W. 1; S.) *Wolti*

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. (1; F. 1; W. 1; S.) *Christiansen*

PRIVATE INSTRUCTION COURSES

N. WOODRUFF CHRISTIANSEN, *violin, band and orchestra instruments*; WALTER WELTI, *vocal*; GEORGE PAHTZ, *cello*;, *piano*. *Instructors*: LUCY L. CHRISTIASEN, *piano*; S. E. CLARK, *piano and organ*; THELMA LUNDQUIST, *piano*; MISCHA POZNANSKI, *violin*; JEAN C. THATCHER, *piano*; PATIENCE THATCHER, *vocal*; ELDON TORBENSEN, *brass instruments*; IRVING WASSERMANN, *piano*; JEANNE T. WELTI, *piano*. *Assistant Instructors*: JOHN HUGHES, *clarinet and saxophone*; MAX LUND, *vocal*; BETTY MARSHALL, *piano*; ELEANOR SMITH, *piano*; MARY JEAN SORENSEN, *piano*. *Limited Assistant Instructors.*

The following courses are given through private study only. Appointments and fees must be arranged with the instructor whom you select.

Note: Students taking one lesson a week in any private music study, and getting the required amount of practice and preparation, shall register for one and one-half credits per quarter. Students taking two lessons and getting the required amount of practice and preparation shall register for three credits per quarter. Upper division credit will not be given students who are below junior standing.

50P, 51P, 52P, 150P, 151P, 152P. **Piano.** Fundamental and advanced techniques. A study of material suited to the ability of the performer. *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. *Pahtz*

66P, 67P, 68P, 166P, 167P, 168P. **Pipe Organ.** See statement for piano. *Clark*

Physical Education and Recreation

H. B. HUNSAKER, W. B. PRESTON, *Professors*; ELIZABETH DUTTON, *Associate Professor*; J. K. VANDERHOFF, ISRAEL HEATON, MARY E. WHITNEY, *Assistant Professors*; SHIRLEY NELSON, DALE A. NELSON, *Instructors.*

INTERCOLLEGIATE ATHLETIC STAFF

E. L. ROMNEY, *Professor, Director Athletics*; JOSEPH E. WHITESIDES, HOWARD B. LINFORD, PAUL MARSTON, *Assistant Professors*; MARVIN T. BELL, GEORGE NELSON, *Instructors.*

SERVICE COURSES

In the service courses of this department, an opportunity is given each student to perfect skills in some form of physical activity which will help establish a permanent interest in healthful recreation of the active as well as passive type, the promotion of physical fitness, the building of morale, and the maintenance of health.

A physical examination is given to all students at the beginning of each year in order to advise them properly as to the type of activity best suited to their individual needs.

Women students are required to take physical education service courses for six quarters. Classes may be selected by the student; and the same numbered courses may not again be taken for credit. Before a student may enter an intermediate or advanced course, in any activity in which she has completed and received credit for the elementary course, minimum service course requirements must have been satisfactorily completed.

It is recommended that all male students take some activity course in Physical Education. A wide range of courses in aquatics, dual, team, individual and outing activities are offered each quarter. Credit in Physical Education counts towards a college degree.

INTRAMURAL SPORTS

Intramural sports are conducted as a part of the program of the Department of Physical Education and Recreation. The Women's Athletic Association, in cooperation with the Women's Division of the department, sponsors and offers a wide and varied program of activities. All women students are eligible and encouraged to participate in any or all of the sixteen sports offered during the year. Women's intramurals strive to provide "a sport for every girl and a girl for every sport."

The department carries on an extensive organized Intramural sports program for men. Competition in 12 to 16 sports is carried on in four separate leagues, fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues. Students who have qualified through the Physical Education Department for "preferred rating," may receive Physical Education credit for Intramural sports.

The function of the intramural program is to give every student moral, social, physical, and educational values derived from competitive athletics. The program of athletics provides for both individual and team endeavor, "athletics for all," which is the purpose of intramural sports.

RECREATION

The Department of Physical Education and Recreation aims to meet the recreational needs and interests of every student whether he is being trained in agriculture, engineering, business, or other professional fields.

This department will try to prepare the future farmer, banker, teacher or doctor for wise use of his leisure time. After courses in this department, students should be so interested in recreation that they will be valuable aid to any community.

Awards will be given to managers of various recreational groups and individual awards for special achievement. There will be groups organized in hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and social dancing.

PROFESSIONAL COURSES IN HEALTH, PHYSICAL EDUCATION AND RECREATION

Because of the great demand for trained leaders in physical education and recreation, this department offers an opportunity to obtain a major or a minor in either field and also to meet the state requirements for certification of teachers of physical education and coaching positions. Curricula are offered which lead to qualification in the following positions: Community Recreation and Playground Manager, Coaches in Secondary School, Director of Physical Education in Secondary School, Teacher of Physical Education in Secondary and Elementary School, and Special Teacher of Physical Education in the Elementary School.

To meet the need for the training of teachers in health education, this department is prepared to offer a teaching major in health education. Teaching majors in health education must complete a minimum of 36 quarter hours selected from the following: Bact. 50, 160, 166; P.H. 144, 151, 155, 168, 201; Vital Statistics; P.E. 155, 84; Psy. 145; Field Training in Health Education; Zoo. 111, 112, 116.

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics, inspired by the highest ideals and conducted on a high plane, provide an excellent course in training for citizenship and the preparation to wrestle with life's problems.

In high schools and colleges Competitive Athletics become a great factor for student body consciousness and oneness, and an outlet for great enthusiasm

born of loyalty. They pay dividends in good health, physical development, and such manly qualities as courage, self-control, and the spirit of cooperation.

Every student at the College is given an opportunity to try-out for the various teams. Attractive schedules with teams representing other colleges are arranged in football, basketball, track and field, swimming, wrestling, tennis, golf and skiing.

The College has an attractive Stadium where the games are played, and the Field House seats 3,500 people for basketball contests. It also provides practice areas for other teams.

A splendid spirit of cooperation exists between the Intercollegiate Athletic Department and the Department of Physical Education and Recreation, proper.

COLLEGE HEALTH SERVICE

The Health Service is maintained primarily for the care of students who may become ill during their stay on the campus. This service is also looked upon as an educational department to teach preventive medicine and hygiene. Through consultations, examinations, and advice it attempts to point out the causes of ill health, and to present clearly the fundamental laws of good health.

SERVICE COURSES FOR MEN

2. Football. (1; F.)	<i>Romney</i>
4. Boxing. (1; F. 1; W. 1; S.)	<i>Staff and G. Nelson</i>
5. Boxing. (Advanced) (1; F. 1; W. 1; S.)	<i>Staff and G. Nelson</i>
7. Wrestling. (1; F. 1; W. 1; S.)	<i>G. Nelson</i>
8. Wrestling. (Advanced) (1; F. 1; W. 1; S.)	<i>G. Nelson</i>
12. Track. (1; S.)	<i>Linford</i>
14. Handball. (1; F. 1; W. 1; S.)	<i>Staff</i>
15. Softball. (1; S.)	<i>D. Nelson</i>
16. Swimming. (Beginners) (1; F. 1; W. 1; S.)	<i>Vanderhoff</i>
17. Swimming. (Intermediate) 1; F. 1; W. 1; S.)	<i>Vanderhoff</i>
23. Basketball. (1; F. 1; W. 1; S.)	<i>Whitesides</i>
24. Soccer. (1; F.)	<i>D. Nelson</i>
25. Volley Ball. (1; W.)	<i>D. Nelson</i>
26, 27, 28. Restricted Gymnastics. For students physically unable to take required physical education. Students may register only after consultation with head of department. (1; F. 1; W. 1; S.)	<i>Staff</i>
29. Sigma Delta Psi. (1; S.)	<i>Heaton</i>
37. Tumbling. (1; F. 1; W. 1; S.)	<i>Heaton</i>
38. Gymnastics. (1; F. 1; W. 1; S.)	<i>Bell</i>
116. Swimmers. (1; F. 1; W. 1; S.)	<i>Vanderhoff</i>
187. Advanced Swimming. Prerequisites: P.E. 16, 17, 116. (1; W.)	<i>Vanderhoff</i>

SERVICE COURSES FOR WOMEN

39. Soccer-Speed Ball. (1; F.)	<i>S. Nelson</i>
40. Volleyball. (1; F. 1; W.)	<i>Dutton</i>
41. Basketball. (1; W.)	<i>Whitney</i>
42. Softball. (1; S.)	<i>S. Nelson</i>
43. Field Hockey. (1; S.)	<i>Dutton</i>
44. Tumbling and Stunts. (1; W. 1; S.)	<i>Dutton</i>
45, 46, 47. Restricted Activities. For students physically unable to take the required work in physical education. Students may register only after consultation with head of department. (1; F. 1; W. 1; S.)	<i>S. Nelson</i>
48. Modern Dance. (Elementary.) Fundamental movement techniques, elements of rhythmic, and musical patterns, materials of design and composition, original composition of dance forms, history of the dance. (1; F. 1; W. 1; S.)	<i>Whitney</i>

49. **Modern Dance.** (Intermediate.) Prerequisites: P.E. 48 and satisfactory completion of minimum service course requirements. Further practice and development in modern techniques and composition. (1; W. 1; S.) *Whitney*
52. **Swimming.** (Elementary.) (1; F. 1; W. 1; S.) *Dutton*
56. **Swimming.** (Intermediate.) Prerequisites: P.E. 51 or satisfactory completion of elementary minimum service course requirements. (1; F. 1; W or S.) *Dutton*
58. **Rifle.** (1; F. 1; S.) *Staff*
59. **R. O. T. C. Sponsor.** (1; W.) *Staff*
60. **Body Conditioning and Physical Fitness.** Theory and practice of body conditioning. (1; F. 1; W. 1; S.) *Whitney*
141. **Modern Dance.** (Advanced.) Prerequisites: P.E. 48, 49 and consent of instructor. Further practice and development in techniques and composition of modern dance. (1; S.) *Whitney*
154. **Swimmers.** Prerequisites: P.E. 52, 56 or satisfactory completion of minimum service course requirements in both courses or a senior life saving certificate. (1; F. 1; W. 1; S.) *Whitney*

SERVICE COURSES FOR MEN AND WOMEN

1. **Hiking.** (1; F. 1; S.) *D. Nelson*
3. **Winter Sports.** (1; W.) *Vanderhoff*
9. **Fencing (Elementary).** (1; F. 1; W. 1; S.) *Staff*
61. **Archery.** (1; F. 1; W. 1; S.) *S. Nelson*
63. **Recreative Games.** (1; F. 1; W. 1; S.) *Staff*
66. **Badminton.** (1; F. 1; W. 1; S.) *Staff*
67. **Tennis (Elementary).** 1; S.) *Staff*
68. **Folk Dance.** (1; F. 1; W.) *Whitney*
70. **Tap Dancing.** (1; F. 1; W. 1; S.) *S. Nelson*
72. **Social Dancing.** (1; F. 1; W.) *Heaton*
73. **Golf.** (1; S.) *Vanderhoff*
74. **Life Saving.** Prerequisites: Ability to swim and permission of the instructor. Proper American Red Cross Certification is given those students who pass the examination. (1; W.) *Vanderhoff*
90. **Tennis.** (Intermediate.) (1; S.) *Vanderhoff*
132. **Water Safety Instructor's Course.** Prerequisite: An American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life saving and the use of small water crafts. Proper American Red Cross Certification is given those students who pass the examination. (2; S.) *Vanderhoff*
136. **Golf.** (Advanced.) (1; S.) *Vanderhoff*
155. **Diving.** Prerequisite: Swimming. (1; S.) *Vanderhoff*
161. **Archery.** (Advanced.) Prerequisite: 61. (1; W. 1; S.) *S. Nelson*
166. **Badminton.** (Advanced.) Prerequisite: P.E. 66. (1; F. 1; W. 1; S.) *Hunsaker*
167. **Tennis.** (Advanced.) Prerequisite: P.E. 67. (1; S.) *Dutton*
168. **Square Dancing.** (1; F. 1; W. 1; S.) *Heaton*

THEORY AND PROFESSIONAL COURSES

- Sp. 20. **Playground Dramatics and Pageantry.** See Speech 20.
- 20, 21, 22. **Fundamental of Sports.** A freshman laboratory course for Men Physical Education Majors. These courses are prerequisites for P.E. 120, 121, 122. (1; F. 1; W. 1; S.) *Heaton*
- 30, 31, 32. **Fundamentals of Sports.** A sophomore laboratory course for Men Physical Education Majors. These courses are prerequisites for P.E. 130, 131, 132, and are a continuation of the Freshman class. (1; F. 1; W. 1; S.) (Not taught 1948-49.) *Heaton*
43. **Recreational Crafts.** See Industrial Arts 43.

55. **First Aid.** The 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. The American Red Cross First Aid certificate may be obtained by students who pass a satisfactory examination. (3; F. 3; W.) *Staff*
75. **Introduction to Physical Education.** A survey of the whole field of physical education, showing its relationship to art and enriched living. (2; F.) *Heaton*
80. **Nature and Function of Play.** Basic principles underlying play; the function of play in the growth, development, and social adjustment of the child and the adult. (2; W.) *Dutton*
81. **Rhythms and Dramatic Games.** Music for young children and its use in creative movement. Methods of presenting and developing rhythms are studied. (2; F.) *Whitney*
83. **Playground and Community Recreation Leadership.** Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (4; S.) *Heaton*
84. **Normal Growth and Development.** Laws of normal growth and development of child differences. Special emphasis on age characteristics with sex and individual differences. (3; S.) *S. Nelson*
85. **Methods in Intramural Organization for Men.** Organization of intramural athletics. (3; F.) *Hunsaker*
- 86, 87. **Sports Officiating.** The knowledge of rules, mechanics of officiating, proper instructions to other game officials such as timers and scorers, and game administration. (2; F. 2; W.) *M. Bell*
92. **Organization of Intramural Programs for Women.** Organization of sports days, play days, tournaments and the administration of intramural activities for women. (2; W.) *S. Nelson*
- 94, 95, 96. **Physical Education Laboratory.** For teaching team sports fundamentals to freshman and sophomore women majoring or minoring in physical education. (1; F. 1; W. 1; S.) (Not taught 1948-49.) *S. Nelson*
- 97, 98, 99. **Physical Education Laboratory.** For teaching individual sport and dance fundamentals to freshman and sophomore women majoring or minoring in physical education. (1; F. 1; W. 1; S.) *S. Nelson*
104. **Kinesiology.** Articulations and muscles with emphasis on movements and actions. The skeleton, manikin, and man himself afford the laboratory material. (3; F.) *Whitesides*
106. **Physiology of Activity.** Changes in important organ systems in relation to muscular activity are treated in this course. Prerequisite: Physiology 4. (4; W.) *Staff*
- 120, 121, 122. **Technique of Team Sports.** For men students majoring in physical education. Prerequisites: P.E. 20, 21, 22. Students taught techniques of dual combatives and team sports. Each student expected to prepare a teaching syllabus of class work. (2; F. 2; W. 2; S.) *Heaton*
- 130, 131, 132. **Technique of Individual Sports.** For men students majoring in physical education. Prerequisites: P.E. 30, 31, 32. Students taught technique of individual gymnastics, and aquatic sports. Each student expected to prepare a teaching syllabus for class work. (Not taught 1948-49.) *Heaton*
150. **Methods in Dance.** For students planning to teach Dancing: tap, folk, modern or social dancing. A syllabus required of each student. (4; S.) *Whitney*
153. **Leadership in Dance.** An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing must be taken as a prerequisite. Emphasis given methods of teaching group dancing and in creating original routines. A syllabus is required. (2; 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 taught 1948-49.) *Dutton*
- 163, 164, 165. **Techniques of Individual Sports for Women.** Upper division students majoring or minoring in physical education are taught techniques of

*Does not satisfy Biological group requirement.

teaching and officiating the following individual sports: Fall: swimming, diving, and tumbling; Winter: archery, badminton and fencing; and Spring: golf, and tennis. (2; F. 2; W. 2; S.)
Dutton

177. **Elementary School Physical Education.** A survey of the activities program aids, equipment, facilities and leadership needed to carry on an adequate program of physical education in the elementary school. (3; W.)
Dutton

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. (2; F. 2; S.)
D. Nelson

180. **Corrective Physical Education.** (Women.) Facts in body mechanics which contribute to the basic principle of posture. Analysis of postural deviations, their prevention and correction. Prerequisites: Physiol. 104, 106 and 4. (3; S.)
Dutton

181. **Corrective Physical Education.** (Men.) Techniques or mechanics of of the movements in the classified groups of physical education activities; teaching explanations of how to make movements or coordinations; skills; nomenclatures used in the formulation of a working nomenclature for all activities. (3; S.)
Hunsaker

182. **Materials and Methods in Physical Education for Elementary Schools.** Activity interests of children and appropriate materials for different age levels, selection of materials, and methods of presentation. (4; S.)
Dutton

183. **Interpretation of Physical Education Objectives.** Results and values of physical education activities under leadership in terms of development, adjustment and standards and their relationships as objectives. (5; F.)
Hunsaker

184. **Administration of Physical Education.** Administrative procedures in the conduct of physical education in the high school; curriculum construction and program planning. Prerequisite: P.E. 92 (for women), P.E. 85 (for men). (3; S.)
Hunsaker

185. **History of Physical Education.** (2; W.)
Vanderhoff

188. **Methods in Football.** Fundamentals of football, theory and practice, details of such position on the team, training, and managing, complete technique of developing offensive and defensive tactics. A comparison of the various systems in American intercollegiate football. (2; F.)
Romney

189. **Methods in Basketball.** Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; various methods of defense and offense. (2; W.)
Whitesides

190. **Methods in Track and Field.** How to train for various track and field event; their form and technique; conduct of the athletic meets; construction, use, assembling of all equipment used by the participants on the field; development of certain types of individuals for certain events. (2; S.)
Linford

191. **Interpretation of the Health Examination.** Examination procedures, the detection of physical defects, the general assessment of the health of the individual and the follow-up program. (3; S.)
Preston

192. **Tests in Physical Education.** Practical studies of tests now in use, and the technique of test construction. (3; W.)
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 cooperation in a united recreation program. (3; W.)
Heaton

199, 299. **Physical Education Seminary.** (3; F. 3; W. 3; S.)
Hunsaker

250. **Reading and Conferenc.** Provides for individually directed study. Credit arranged.
Hunsaker

271. **Research and Thesis Writing.** Credit arranged.
Hunsaker

Psychology

ARDEN FRANSDSEN, *Professor*; D. R. STONE, HEBER C. SHARP, *Assistant Professors*; GLENN R. HAWKES *Instructor*.

Courses in the Department of Psychology contribute to the professional training and personal development of students in nearly every department of the college.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Some of the important areas of human activity in which the science is applied are (1) Using psychological tests* of intelligence, aptitudes, interests, and personality for helping individuals to choose the educational, vocational, and social activities in which they are likely to contribute most to society and to gain most personal satisfaction; (2) applications of scientific principles of learning for easier, more rapid, and effective training of individuals in schools, in industry, in families, and in other situations where education of people is attempted; (3) preventing and/or correcting difficulties in school achievement, vocational inefficiency, personality and conduct abnormalities by diagnostic and remedial treatment when needed by certain persons and by general provisions for the cultivation and maintenance of mental health; and (4) scientific analyses of the individual and environmental conditions which affect development and performance (including work activities) in industry, school, home, and community. Although psychology is a relatively young science, its research and practical applications have already resulted in significant contributions to human efficiency, usefulness, and happiness; persons now working and others who will prepare for professional service in psychology will have the opportunity for continuing and extending these important human services.

A major in psychology should prepare students for diagnostic and remedial teaching and for dealing with minor personality and conduct problems of children in the elementary school and in child guidance clinics; for guidance and psychological counseling in high schools; for teaching psychology, study habits, mental health, and personality development in high schools; for personnel work (at the junior professional assistant level) in industry, the U. S. Employment Offices, and in various Civil Service positions; and for graduate study in psychology, education, child development, and social work. It is also a suitable major for students planning to study medicine, nursing, or law after graduating from college.

Requirements for a major in psychology include 40 credits of approved courses, from the following: REQUIRED: Psychology 53, 71, 102, 105, 112, 127, 140 or 145, 161, 181, 182, 183, and ELECTIVE: from Psychology 31, 33, 55, 102, 108, 114 or 115, 121, 123, 140, 145, 175, 188, 191, 202, 231 285; Mathematics 111; Sociology 170; Education 107, 110, and 211; and Speech 167 or 171.

Besides completing the general education group requirements for graduation, students majoring in psychology are advised to supplement their major with additional courses in social science, biological science, mathematics and physics, literature, and child development.

A minor in psychology (which should include Psychology 53, 71, 102 or 105, 112, 127, 140 or 161, 181, and 183) is recommended for any high school teacher who expects to participate in the school guidance and counseling program, for social workers who do not take an undergraduate major in psychology, for students majoring in speech correction, for students who major in business administration and who are interested in personnel administration, and for students majoring in other social sciences.

Master of Science Degree in Psychology. This degree meets the training requirements for the First Class School Counselor's Certificate issued by the Utah State Board of Education, it prepares the student for more advanced positions in clinical psychology in government services and in other social agencies, or for work in industry, and it is the first step in graduate study toward the

* A testing and counseling service is also available to all students who would like help in making educational and vocational choices, and in problems of personal adjustment. This clinical and counseling service also provides opportunity for important work experience for students majoring in psychology. Inquire at Room 175, Main Building.

doctorate degree in psychology. Thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin study for the M. S. degree in psychology.

Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program of courses both in psychology and in related fields to meet the student's objective should be arranged. In preparation of a school counselor, for example, courses would be chosen from psychology, education, social work, and sociology. Recommended courses in psychology are: Psychology 112, 191, 202, 214 or 215, 223, 231, 281, 282, 283, 288 and 217; Mathematics 111 or Education 211 or Psychology 212; plus courses in Psychology numbered between 100 and 200 which were not taken as an undergraduate student. Regardless of the student's special interests, the M. S. degree in psychology should include study in the following fields: general, systems, and history; learning, education and child; clinical psychology; mental hygiene and abnormal psychology; experimental and physiological psychology; social psychology, personality and meaning; and statistics. Upon completion of study of the M. S. degree the student will have become acquainted with all of these areas; some of them, however, may have been studied as an undergraduate student.

COURSES IN PSYCHOLOGY

31. Psychology of Meaning. An introductory course designed to aid students to find the "meaning" of what they experience. Principles for the interpretation of speech, writing, and other forms of symbolic behavior are presented with the purpose of moving toward maturity of understanding. (3; F.) *Stone*

33. Psychology of Personal and Social Adjustment. Mental hygiene for lower division students from every school in the College. How to acquire emotionally healthful patterns of behavior and to eliminate unhealthy patterns of behavior. Mental hygiene principles are developed and applied to personal and social behavior in several major life activities—educational, vocational, family, recreational, and religious. (3; W.) *Sharp*

51. Psychology for Nurses. (3) Time arranged. *Staff*

53. Elementary General Psychology. General principles of human behavior and experience including: nature of personality; factors determining development; how we learn, observe, and think; motives of human conduct; dealing with people; and the maintenance of personal efficiency and mental health. Intended for Lower Division students in all school of the College. (5; F, W or S.) *Stone and Sharp*

55 or 155. Psychology of Business and Industry. The methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice and the selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work, and the psychological aspects of training for work in business and industry. (See also Bus. Admin. 54.) Prerequisite: General Psych. or instructor's approval. (3; W.) *Stone*

71. Experimental Methods in Psychology. The scientific method and specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: General Psych. (3; F.) *Sharp*

80. Study Habits. A practical course, highly individualized and designed to aid student in improving the efficiency of their work and study habits. Individual appointments arranged for one-third of the time. (2; F, W or S.) *Stone*

102. Educational Psychology. A professional course for prospective high school teachers intended to increase understanding of personality and to develop greater insight into the conditions for effective learning. Applications to development in adolescence of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects are emphasized. Prerequisites: General Psych. (5; F, W or S.) *Frandsen*

105. Child Psychology. The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional development of children from birth to adolescence. Generalizations with respect to individual differences, emotions, motivation, how children learn, observe, and think are

applied to understanding and guiding children's behavior in home, school, and community. Opportunity for observation and applications of psychological methods of child study in the school is provided. Prerequisites: General Psych. (3; F or S.) *Frandsen*

108. Educational Psychology of the Elementary School Curriculum. A study, from the point of view of psychological theory and research, of the aims, selection, and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. The tool subjects are emphasized. Prerequisite: General Psych. (3; W.) *Frandsen*

112. Applications of Statistics to Education and Psychology. An elementary study of statistical procedures used in handling test scores in the schools and of the concepts needed to read current educational and psychological literature. May be taken by lower division students who have taken General Psych. (3; F or S.) *Frandsen, Stone or Sharp*

114-214. Independent Readings in Psychology. For students who cannot participate in the discussions in Psychology 115. Provides an opportunity for independent readings and conferences on topics elected by the student. (2) Any quarter. *Frandsen, Stone or Sharp*

115 or 215. Seminar. Readings and Discussions on Current and Special Topics in Psychology. Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or of periodical literature on some specialized topic, selected according to each student's interest. (May be taken 1, 2 or 3 quarters.) (2; F. 2; W. 2; S.) *Frandsen, Stone or Sharp*

116. Beginning Research in Psychology. To acquire some experience in research methods, students are supervised by a staff member in conducting minor experimental studies in psychology. Prerequisite: elementary statistics. (1-3; F, 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 should find useful applications in the study and work of students majoring in social and biological sciences—sociology, political science, economics, education, medicine, public health, and genetics as well as psychology. (3; W.) *Frandsen*

123 or 223. Psychology of Exceptional Children. The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment especially suited to their needs. The groups included are the mentally deficient, the gifted, children with special achievement disabilities, speech defectives, the crippled and physically handicapped, and children with serious personality and conduct problems. (3; W.) *Frandsen or Sharp*

127. Psychology of Learning. Descriptions of learning, factors related to efficiency, explanatory theories of learning, and of applications of the facts and explanatory principles to guiding learning in school and out-of-school situations. Prerequisite: General Psych. (3; W.) *Frandsen or Sharp*

140. Abnormal Psychology. A descriptive and explanatory study of the varieties of mental abnormality—psychoses, psychoneuroses, and minor maladjustment—their causes, the methods of treatment and the mental hygiene approach in preventing psychological maladjustments. Prerequisite: General Psych. (3; S.) *Sharp*

145. Mental Hygiene. The common personal and social adjustment problems of normal people. It shows how people, in striving to attain a balanced satisfaction of motives in their major life activities, learn different modes of adjustment: effective patterns of behavior, a variety of maladjustive mechanisms, and non-adjustive reactions. It should aid in cultivating personal efficiency and mental health and increase understanding of the human problems dealt with by parents, teachers, social workers, and personnel workers. Prerequisite: General Psych. (3; W.) *Sharp*

161. Social Psychology. The acquisition of personality or "self." The effect of society on the individual, and the individual's reciprocal effect on society is considered in terms of such topics as propaganda, institutional behavior,

"social" neuroses, morale, leadership, membership, etc. Sociological concepts here serve as valuable context for the basic psychological elements in the analysis of the individual's personality development as he encounters the world. Prerequisite: General Psych. (3; S.) *Stone*

175 or 275. Physiological Psychology. Physiological mechanisms underlying typical normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisite: General Psych. (3; S.) *Sharp*

181 or 281. Clinical Psychology: Psychometrics Applied to Guidance, Adjustment Problems, and Remedial Teaching. A course for school counselors, personnel workers, social workers, and clinical psychologists, which considers selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes interests, personality and quality of personal and social adjustment. Prerequisites: General Psych. and Elementary Statistics. (5; F.) *Frandsen*

182 or 282. Clinical Psychology: Directed Practice in the Administration of Individual Tests. The emphasis is on acquiring skill in diagnosing intelligence by the individual Binet procedure; but the writing of clinical reports and recommendations and the uses of other individual tests of aptitudes, personality, and adjustment are also studied. Prerequisite: Clinical Psych. 181 or equivalent. (4; W.) *Frandsen*

183 or 283. Clinical Psychology: Theory and Practice of Counseling and Psychotherapy. In educational and vocational guidance, in improving school achievement and worker efficiency, and in treating problems of personal and social maladjustments, the uses of the following procedures are studied: non-directive counseling; directed problem-solving interviewing; giving advice, assurance, persuasion, and information; and of controlled family, school, club or camp, community, and institutional environments. Prerequisite: General Psych. (3; S.) *Frandsen or Stone*

188 or 288. Practicum in Clinical Psychology. Student are assigned a testing schedule in the psychological clinic where they administer, score and evaluate tests, and participate in interpretive sessions. (F, W or S.) Time and credit arranged (not to exceed 5 credits). *Staff*

191. History and Systems of Psychology. The history of psychology and a critical comparison of the several systematic points of view on major problems in psychology. (3; F.) Alternate. *Stone*

202. Advanced Educational Psychology. Contributions of modern theory and research to the following fundamental problems of teaching and guidance will be studied: motivation; learning; improvement of study habits, uses of tests in guidance and in measurement of achievement; social psychology of childhood and adolescence; personality and conduct problems; and mental health. Problems for master's degree thesis are indicated. Prerequisite: Ed. Psych. (5; F.) *Frandsen or Stone*

212. Treatment of Psychometric Results. Statistical methods of representation, interpretation, and analysis of interrelationships of psychological test scores. (W) *Frandsen*

216. Research on Special Problems in Psychology. Credit and time arranged, with the approval of a member of the Department Staff. *Frandsen, Stone, Sharp*

217. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department Staff. *Frandsen, Stone, Sharp*

231. Advanced Psychology of Meaning. A seminar course for graduate students. Analysis of the physiological and socio-psychological bases of meaning, and the classification of "sign behavior." (W) Alternate. *Stone*

285. Projective Methods for the Study of Personality. The dynamics of human adjustment and of the common projection methods for revealing motives, attitudes, and adjustment mechanisms in individual personalities. (3; S.) *Frandsen*

SECONDARY EDUCATION

JOHN C. CARLISLE, *Chairman*

JOHN C. CARLISLE, L. R. HUMPHERYS, *Professors*; L. G. NOBLE, *Associate Professor*; HELEN CAWLEY, *Assistant Professor*; C. E. MCCLELLAN, *Professor Emeritus*.

For a major in Secondary Education the student must complete at least 40 credits of professional work in Education and Psychology. The major field of study must be distributed approximately as follows:

- (1) Nine credits in the field of understanding the pupil: Psychology 102; Education 113; Public Health 155; Psychology 105, 123, 140, 145, 175, 181, 182, 183, 202, 285 or Physical Education 84 or 192.
- (2) Six credits in the field of understanding the school: Education 114, 116, 201, 141.
- (3) Fifteen credits in student teaching, methods and curriculum: Education 111, 127, 129, 130, 107, 108, 115, 161, 194; Art 151; English 123; Speech 123; Secretarial Science 179 or 180; Music 121, 122 or 123; Physical Education 20, 130, 160, 63.

Note: Courses other than Education and Psychology may be elected only by students with teaching majors in these specific fields.

A teaching major of not less than 40 credits, of which 15 credits must be Upper Division, and a teaching minor of 18 credits in subjects taught in high schools are required of majors in secondary education. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not less than 60 credits in two or more related subjects with a minimum of 18 credits in any field included in the composite major. At least one-half of the work must be of Upper Division grade. Composite majors are offered in the following fields: Social Science, Language Arts, Physical Science and Mathematics, Biological Science, Commercial Education.

Selection of a program of study should be under the guidance of the major professor. Completion of a major in Secondary Education includes all requirements for a Utah General Secondary School Certificate.

111. Principles of Secondary Education. Problems and principles involved in the learning process; relationships between learner, subject matter, and method; objectives, motivation, direction, discipline, evaluation, and other fundamental considerations. Prerequisite: Ed. Psych. (3; F, W or S.) *Carlisle*

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 examined and evaluated. (3; S.) *McClellan*

123. The Teaching of English. A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study materials and methods in the three fundamental areas of English instruction: grammar, composition and literature. (3; F.) *Hayward*

123. Teaching of Speech. The methods and problems peculiar to the teaching of Speech. The organization of courses and lesson plans is included. Students may register only with permission of instructor. (2; F.) *Myers*

127. Secondary School Methods. This course, to be taken along with Education 129, considers such subjects as personality of the teacher, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, discipline, evaluation. (2; F, W or S.) *Carlisle, Noble*

129. Student Teaching in the Secondary School. Required for certification. Students may be enrolled only after completing Psych. 102 and Ed. 111 and at least 18 credits in the field in which they expect to do practice teaching. Ed. 127 must be taken during the same quarter. It is recommended that Ed. 130 be taken the same quarter, in which case at least two periods per day are required (one for each course). The student is assigned to a sponsor teacher in the secondary school. A brief period of observation is followed by gradually increasing responsibilities until upon completion of the two courses the student

has had guided experiences in all professional responsibilities of the typical faculty member in the junior or senior high school. (4; F, W or S.) *Carlisle*

130. Student Teaching in the Secondary School. A continuation of Education 129, which must precede it or be taken concurrently. (4; F, W or S.) *Carlisle*

161. Audio-Visual Aids in Education. Emphasizes the importance of audio-visual aids in the school program. Building a workable program in which are utilized the newest materials and techniques. (3; F.) *Noble*

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts. Arrangement of the shop, studio, selection of tools, and supplies. Required of all majors and minors in art on this level. Prerequisites: Art 1, 2. *Staff*

179. Methods of Teaching Typewriting. Recent development and practices in the teaching of typewriting. The analysis of objectives, laws of learning, organization of materials, texts, standards of achievement, methods of acquiring speed and accuracy are considered. For those preparing to teach typewriting and those engaged in teaching who wish to render their teaching more effective. (3; W.) *Neuberger*

180. The Teaching of Shorthand. Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. (Consult instructor before registering. (3; F.) *West*

237. Problems in Secondary Education. For graduate students in secondary education and those preparing for school administration or supervision at the junior-senior high school levels. Deals with a review of research in the field together with emphasis upon areas of particular concern to members in the class. (3; W.) *Carlisle*

Three credits earned in methods courses in any of the following fields may be counted toward certification by majors in these fields.

VOCATIONAL EDUCATION

L. R. HUMPHERYS, *Chairman*

Candidates for a teacher's certificate in the several fields of Vocational Education need to comply with the Utah Certification requirements. The following courses are suggested:

Agriculture Basic: Psychology 102; Education 112, 113, 114, 125, 126; Bacteriology 155; Elective 3 credits.

Home Economics Basic: Psychology 102; Education 114, 120, 121, 122; Bacteriology 155; Elective 7 credits.

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. (3; W.) *Humpherys*

113. Vocational Guidance. Individual and occupational differences; available tests, measurements, and other devices for determining individual difference; individual and group counseling; and organization of guidance service. Prerequisite: Psych. 102. (3; F, W or S.) *Humphreys, Carlisle*

120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; an appreciation of methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102. (3; F or S.) *Cawley*

121. Problems in Teaching Home Economics. Recent investigations in Home Economics and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122a and with one other three-hour Education course so that concentrated work may be participated on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4; W or S.) *Cawley*

122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave the campus the middle five or six week of Fall or Winter Quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122a, preferably at the beginning of her junior year, to make other arrangements for her student teaching. In the latter case, the student teacher teaches at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8; W.) *Cawley*

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 education majors interested in securing practical teaching experience. In Spring the student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4; S.) *Cawley*

Field Trip. For senior girls and graduate students enrolled in homemaking education. Trip planned cooperatively by students and homemaking education staff. Trip will probably take place during Spring Quarter, and the estimated cost will be given in advance.

124. Methods of Teaching Farm Mechanics. Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (5) *Humpherys*

125. Methods of Teaching Agriculture. For teachers of vocational agriculture. Fundamental principles and practices of teaching, selection, and organization of subject matter and supervision of agricultural activities on the farm. (5; W.) *Humpherys*

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

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. (1-2; S.) *Humpherys*

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

GRADUATE WORK

Graduate study in the Department of Education leads to the Master of Science degree in Education or to the Five Year Diploma. All courses listed in the department are applicable to either the degree or the diploma with the exception of the following: Ed. 103, 104, 105, 106, 114, 129, 130.

SCHOOL OF ENGINEERING AND TECHNOLOGY

J. E. CHRISTIANSEN, *Dean*; E. C. JEPPESEN, *Chairman, Division of Technology*

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General Information

The School of Engineering and Technology consists of the Division of Engineering and the Division of Technology.

The Civil and Agricultural Engineering curricula were established in 1888 when the College was founded. Automotive, Metals, and Woodwork and Building Construction were also established in 1888, but under the name of Mechanic Arts. Degree work in Radio was established in 1929. Degree work in Aeronautics was established in 1940, and in Air Conditioning and Refrigeration, and Welding in 1947. The four-year curricula lead to the degree of Bachelor of Science, with mention of the specific curriculum taken. The name of the School was changed from the School of Engineering, Industries and Trades to its present name in 1947.

Division of Engineering: The Division of Engineering offers both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. Both of these curricula include courses and majors in Irrigation and Drainage.

The Agricultural Engineering curricula include the common engineering courses of the Freshman, Sophomore, and Junior years. They differ from the Civil Engineering curricula with respect to certain courses in the Junior year, and permit of greater specialization in the Senior year. Students receive instruction in general engineering and agriculture, and may select as a major, Farm Machinery, Farm Structures, or Irrigation and Drainage. Graduates of these curricula are well trained in general engineering and can easily complete all requirements for a degree in Civil Engineering in one additional year.

The Civil Engineering curricula permit the student to choose a major from Highways, Irrigation and Drainage, Structural Design, or Sanitary Engineering. Students not wishing to specialize may, with permission of the Dean, select optional courses from two or more fields and major in General Engineering. Students taking advanced Military are not required to take the optional courses. The curricula in Civil Engineering are fully accredited by the Engineers' Council for Professional Development.

Division of Technology: The Division of Technology offers four-year curricula leading to the Bachelor of Science degree in Industrial Technology, Radio Technology and Industrial Education. Majors are offered in Aeronautics, Air Conditioning and Refrigeration, Automotive, Metals and Machine Practice, Radio, Welding, and Woodwork and Building Construction. Graduate work is offered in Industrial Education. These degree curricula are designed to train skilled technicians, supervisors, managers, plant operators, shop and garage foremen, and teachers of Industrial Arts, and Trades and Industries. They combine training in vocational skills, applied science, and general education.

Technical short courses are offered in Aircraft and Engine Mechanics, Air Conditioning and Refrigeration, Automotive Repair, Auto Body Reconditioning, Carpentry, Diesel Repair, Machine Shop Practice, Commercial Photography, and Welding. These short courses are designed to meet the needs of those who do not desire a degree, but who wish to learn a skilled trade, and at the same time have an opportunity to benefit from general college courses and to enjoy college life.

Admission: For general requirements see the Academic Regulations in the catalog introduction. For entrance in the Division of Engineering, students must have taken in high school, Algebra (b) and Solid Geometry, or the equivalent, or must complete without credit toward graduation Math. 33 and 34. These should be taken concurrently during the Fall Quarter of the Freshman year.

Scholarship: All students must maintain an average grade of C or better to 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 better. In the Division of Engineering, it is important that students make a C grade or better, in all Mathematics taken during the Freshman and Sophomore years. Students who fail to do this usually have difficulty with upper division engineering courses.

Graduation: Candidates for graduation must satisfy the general college requirements as listed in the Academic Regulations, with the exception of 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 future graduates of the School of Engineering and Technology will have ample opportunity for professional employment of an interesting and remunerative character.

Faculty Advisors: Personal contact with the student is provided through a system of advisors who assist the student when registering, and who are available for consultation at all times.

Personnel Service: The School of Engineering and Technology, through its faculty, establishes definite contacts with those industries, corporations, municipal, state, and federal agencies that employ technically trained men. Employment 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 both undergraduate and graduate work leading to the Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. The courses offered by the department of Irrigation and Drainage, constitute an important part of both curricula, and a major option for those wishing to specialize in this field. Many of the leaders in the field of irrigation and drainage are graduates of Utah State Agricultural College.

Objectives: The objectives of the four-year curricula in Engineering are to provide the student an opportunity to secure the thorough, fundamental, and technical education which is necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities which are essential to high professional attainment.

Upper Division Standing: A student must have completed a total of 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22, and Mathematics 99, or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

Engineering Societies: General professional association and advancement are promoted by the activities of the student branches of the national engineering societies, of which the following are represented, either by faculty membership or student chapters, or both: American Society of Civil Engineers, American Society of Agricultural Engineers, American Road Builders' Association, Highway Research Board, American Concrete Institute, American Society for Engineering Education, and American Geophysical Union.

Summer Surveying Camp: During the summer session following the Sophomore year, a surveying camp is held where plane, topographical, and route surveying are taught. Completion of Summer Surveying Camp is required of all engineering students.

Engineering Seminars: Engineering seminars are a feature of the advanced engineering work. Courses 198 and 199 are required of all engineering students during the Senior year.

Field Trips: Field trips to local construction projects, engineering works, and industries are arranged for engineering students. All seniors in engineering are required to take a supervised field trip covering the major engineering works in the western United States. This trip is usually scheduled during the Spring Quarter.

COMMON COURSES

All candidates for a degree in Engineering must complete satisfactorily the following courses common to all engineering curricula:

Course	Freshman			Course	Sophomore			Su
	F	W	S		F	W	S	
C.E. 1, 2, 3	0	0	1	C.E. 84, 82, 85, 87**	3	3	3	7
C.E. 61, 62, 63	2	2	3	Math. 98, 99, 122	5	5	5	3
Chem. 10, 11, (12)*	5	5	(5)*	Physics 20, 21, 22	5	5	5	5
I.D. 12†			4	Geology 3			5	
English 17, 18, 19	3	3	3	Economics 51		5		
Math.‡ 35, 46, 97	5	5	5	Speech 5	3			
Shop§	2	2	2	C.E. 65	1	or	(1)	
M.S. 1, 2, 3	1	1	1	M.S. 4, 5, 6	1	1	1	
	18	18	19(20)		18	19	17(18)	

Agricultural Engineering

J. E. CHRISTIANSEN, O. W. ISRAELSEN, C. H. MILLIGAN, *Professors*; JOSEPH COULAM, A. ALVIN BISHOP, *Associate Professors*; SPENCER H. DAINES, B. L. EMBRY, *Assistant Professors*; J. DONALD WADSWORTH, *Instructor*.

For nearly a century in America, those agricultural problems that have demanded the help of engineers have been solved by civil, mechanical, and electrical engineers. During the last quarter century, the need and value of engineering services in agriculture have grown so rapidly and widely as to demand the development of a major field of engineering designated as Agricultural Engineering.

The Department of Agricultural Engineering offers instruction in courses involving the application of engineering knowledge to the solution of farm problems. The most important of these problems are in the fields of farm machinery, farm motors, rural electrification, farm buildings, farm sanitary equipment, soil erosion control, irrigation, and drainage.

A four-year curriculum leading to a Bachelor of Science Degree in Agricultural Engineering is offered. This curriculum includes mathematics, arts and sciences, fundamental subjects in the different engineering departments, agricultural courses selected to familiarize the student with modern agriculture, and a thorough treatment of the Agricultural Engineering courses.

Graduates from this curriculum have opportunity to work in the following fields: (a) The manufacture and development of farm machinery and equipment; (b) irrigation, drainage, and soil conservation; (c) rural electrification; (d) design and construction of farm buildings; (e) teaching, research, and extension in colleges, experiment stations, and in the United States Department of Agriculture; (f) agricultural engineering for farm papers and technical magazines; (g) selling and maintenance of farm equipment; and (h) management of large farms.

Students majoring in Agricultural Engineering should be well versed in farm practices and have a real interest in the agricultural industry.

The Agricultural Engineering Department has available for its use approximately 6,500 square feet of laboratory space. The farm power and machinery laboratory is equipped to service, overhaul, and maintain farm machinery. The facilities of the irrigation and drainage laboratories are ample to conduct both research and class exercises in all their various divisions. These laboratories are housed in the Engineering and Agricultural Engineering Buildings.

A major in Agricultural Mechanics is available to students registering in the School of Agriculture.

*Chem. 12 required of Sanitary Engineering Majors.
 †I.D. 12 not required of Sanitary Engineering Majors.
 ‡Students deficient in high school Mathematics, Algebra (b) and Solid Geometry, must register for Math. 34 and Math. 33 during the Freshman year. Math. 33 and 34 do not count credit toward graduation in Engineering.
 §Shop includes Metalwork, Woodwork, and Welding. All three courses are offered each quarter.
 **C.E. 87 is to be taken following Sophomore year in Summer Session. Seven credits.

AGRICULTURAL ENGINEERING CURRICULA

Degree: Bachelor of Science in Agricultural Engineering
 Freshmen and Sophomore years—See Common Courses

Junior				Senior			
Course	F	W	S	Course	F	W	S
C. E. 101, 102, 103	4	4	4	C. E. 108, 109, 110	1	1	1
C. E. 141, 142	4	4	—	I. D. 149, 160, 145	3*	3	3
A. E. 110	—	—	2	C. E. 105	6	—	—
C. E. 197, 196, 144	4	4	4	Ag. Econ. 106	—	—	5
B. A. 100	3	—	—	A. E. 109, 108	—	4†	4
C. E. 192	—	3	—	A. E. 115	4	—	—
Agron. 56	—	—	4	A. E. 198, 199	—	2	2
Pol. Sci. 20a, 20b	3*	3*	—	English 111	4	—	—
A. H. 1	—	—	3*	Options*	—	6-9*	3-5*
	18	18	17		18	16-19	18-20

Senior Options				
Major	Course	F	W	S
Farm Machinery	A. E. 111	—	3*	—
Irrigation and Drainage	A. E. 116, 117	—	5	5*
Farm Structures	C. E. 106	—	6	—
	I. D. 146, 147	—	3*	3*
	C. E. 106, A. E. 106	—	6	5*

COURSES

4. Dairy Mechanics. A study of the basic equipment found in modern dairy plants; their accessories and upkeep. Three lectures, one lab. (4; F.) *Daines*

14. Farm Motors for Agricultural Students. The principles, operation, care, and maintenance of internal combustion engines and electric motors. Two lectures, one lab. (3; F or S.) *Daines*

15. Farm Machinery for Agricultural Students. Principles of mechanics and materials as applied to farm machinery. The operation, adjustment, and care of the various types of agricultural machines. Two lectures, one lab. (3; F or S.)

105. Farm Woodwork and Building for Agricultural Students. Location, planning and construction of farm buildings. Wood and metal preservations, fences, and fencing and the farm workshop. Three lectures, two labs. (5; F.) *Coulam*

106. Farm Structures, Economics of farm buildings; insulation as it involves heating and ventilating; mechanics of farm buildings; types of construction; building materials; location and planning of the farmstead; fundamental requirements and design of farm buildings common to western agriculture. Prerequisite: C.E. 105. Three lectures, two labs. (5; S.) *Coluam*

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 any 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. (4; S.) *Bishop*

109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply, and farm sanitation; and farm electrical appliances. Prerequisite: Math. 35. Three lectures, one lab. (4; W.) *Daines*

110. Pumps and Pumping. Selection and installation of pumping equipment, theory of pumps, power schedules and cost of pumping. Prerequisite: C.E. 142. Two lectures. (2; S.) *Miligan*

111. Mechanisms in Farm Machinery. A study of mechanical methods of transmitting motion of farm machines, including cams, gears, universal joints, etc. Prerequisite: C.E. 103. Two lectures, one lab. (3; F.) *Daines*

*Not required of students taking advanced Military.

†Not required of students taking Irrigation and Drainage Option.

113. Farm Machinery Repair. Applied problems in farm machinery repair and maintenance. Prerequisite: Forging 81a, and Welding 96, or equivalent. Three labs. (3; S.) *Wadsworth*

115. Farm Implements. Selections, operation, adjustment and care of the various types of agricultural machines. Prerequisite: A.E. 111. Three lectures, one lab. (4; W.) *Embry*

116. Farm Tractors. A study of design, operation, and performance of the farm tractor. Efficiencies and ratings as determined by the Nebraska Tractor Tests. Tractor troubles and overhauling. Three lectures, two labs. (5; W.) *Daines*

117. Farm Machinery Design. Fundamentals of farm machinery design including draft requirements of farm implements. Selection of metals, stress analysis, layout and construction of farm machines. Prerequisite: A.E. 111. Three lectures, two labs. (5; S.) *Daines*

198, 199. Engineering Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two credits each quarter. Two lectures. (2; W. 2; S.) *Christiansen*

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. *Staff*

Civil Engineering

J. E. CHRISTIANSEN, O. W. ISRAELSEN, H. R. KEPNER, C. H. MILLIGAN, *Professors*; DEAN F. PETERSON, JR., E. M. STOCK, A. ALVIN BISHOP, *Associate Professors*; SPENCER H. DAINES, B. L. EMBRY, WILLIS A. TINGEY, *Assistant Professors*; REYNOLD K. WATKINS, *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 curriculum in Civil Engineering has been carefully planned, and is accredited by the Engineers' Council for Professional Development. It is based upon a thorough training in English, mathematics, physics and chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to the many phases of Civil Engineering. Special emphasis is placed upon work in Irrigation and Drainage.

A Summer Surveying Camp is required, and academic work is supplemented by local field trips during the Junior year, and a major field trip of approximately one week duration, during the Senior year. These field trips provide opportunity for first hand study of projects under investigation, construction and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

An analysis of the status of the Civil Engineering graduates from Utah State Agricultural College shows that approximately 80 percent are in federal, state, city, or county positions, and about 20 percent in private practice, or working for private corporations. Finding employment for graduates has not been a problem at this institution.

The Engineering departments are housed in the Engineering Building, where well equipped laboratories and classrooms provide ample facilities for the work in engineering. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. A model hydraulic laboratory demonstration unit is available for instruction and laboratory use. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the en-

engineering properties of soil. The laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscope.

CIVIL ENGINEERING CURRICULA

Degree: Bachelor of Science in Civil Engineering.

Freshman and Sophomore courses—See Common Courses, page ...

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, 148	4	4	4	C.E. 108, 109, 110	1	1	1
C.E. 197, 196, 173	4	4	4	C.E. 150, 190, 182*	4	3	2*
C.E. 192, 120	—	3	3	I.D. 146*, 145*	—	3†	3*†
B.A. 100	3	—	—	C.E. 198, 199	—	2	2
Pol. Sci. 20a, 20b	3†	3†	—	English 111‡	4	or	(4)
Geol. 103 or C.E. 181	—	—	3†	Options†	3†	3†	3†
	18	18	18		18	18	16(18)

Senior Options§

Major	Course	F	W	S
Highways	C.E. 124, 125, 127	3	3	3
Irrigation and Drainage	I.D. 149, 160, 147	3	3	3
Structural Design	C.E. 180, 181, 182	3	3	3
Sanitary	Bact. 70, 140, P.H. 144	4	3	3
	C.E. 193, 194, 195	3	4	4

COURSES

1, 2, 3. Engineering Orientation. A preview of engineering; including what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. One lecture each week. Required of all Freshman Engineering students. One credit for completion of three quarter sequence. *Staff*

59. Blue Print Reading and Industrial Drawing. Primarily for majors in Business Administration. The reading and interpretation of blue prints, use of instruments, lettering, and elementary drawing, including construction of graphs, flow charts, etc. Three labs. (3; W.) *Daines*

60. Elementary Drawing. Primarily for Forestry students. The use of instruments, simple lettering, and drawing. One lab. (1; W.) *Staff*

61. Engineering Drawing. Use of instruments, lettering, applied geometry, orthographic projection, and technical sketching. Two labs. (2; F or W.) *Staff*

62. Advanced Engineering Drawing. Pictorial representation, conventional representation, dimensioning, working drawings, and lettering. Prerequisite: C.E. 61. Two labs. (2; W or S.) *Staff*

63. Descriptive Geometry. Principal and auxiliary views; points, lines, and planes; developments, intersections, and warped surfaces; mining problems. Prerequisites: C.E. 61, Mech. Draw. 91, or L.A. 20. One lecture, two labs. (3; F or S.) *Staff*

65. Engineering Problems. Practical engineering problems solved by the use of algebra and trigonometry. Methods of computations include the use of logarithms, slide-rule, and calculating machines. Special emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 46. One lab. (1; F or S.) *Tingey*

80. Office Practice (For Foresters). Practice in preparing office plans from surveys that are encountered by the forester in working up field notes. Prerequisite: C.E. 81 or equivalent. Two labs. (2; W.) *Tingey*

*Not required of students electing Sanitary Engineering Option.

†Not required of students taking Advanced Military.

‡Sanitary Majors should take English 111 in Spring Quarter.

§Students may select courses from more than one option, or may elect other subjects in the college curriculum under the general supervision of the Dean, and will be classed as majors in General Engineering.

- 81. Plane Surveying.** Primarily for Foresters. Use of tape, hand level, level, transit, compass, etc. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math 35 and 46. Two lectures, two lab. (4; F or S.) *Tingey*
- 82. Mapping and Office Practice.** Practice in mapping of the various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. Two lectures, one lab. (3; W.) *Stock*
- 84. Elements of Surveying.** For engineers. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35 and 46. Two lectures, one lab. (3; F.) *Stock*
- 85. Advanced Surveying.** For Engineers. Problems in chaining, leveling, curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Two lectures, one lab. (3; S.) *Stock*
- 87. Summer Surveying Camp.** Surveying office and field practice in camp. Topographic, land, route, and geodetic surveying. Actual field surveys are made. Students pay their own transportation and living expenses and the regular summer quarter registration fee. Prerequisite: C.E. 85 or equivalent. Daily, eight hours a day, for six weeks. (7; Su.) *Stock*
- 101, 102, 103. Engineering Mechanics.** Includes statics, dynamics, and strength of materials. The Fall Quarter and part of the Winter Quarter are devoted to the study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and the kinematics and kinetics of bodies in translation, rotation, and plane motion. The remainder of the year is devoted to the study of properties of engineering materials, stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads and special topics. Prerequisite: Math. 99. Three lectures, one lab. (4; F, W or S.) *Kepner*
- 105, 106, 107. Structural Theory and Design.** The Fall Quarter is devoted to the analysis and design of framed structural elements of steel and timber. This is followed in the Winter Quarter by a study of the analysis and design of portions of buildings and bridges involving the principles studied during the first two quarters. Prerequisites: Engineering Mechanics, C.E. 101, 102 and 103. Fall and Winter Quarters lecture daily, one lab. Spring Quarter, three lectures and two labs. (6; F. 6; W. 5; S.) *Kepner*
- 108, 109, 110. Materials Testing Laboratory.** Strength, composition, and physical properties of engineering materials, including wood, concrete, metal and bituminous. One lab. (1; F. 1; W. 1; S.) *Watkins*
- 120. Roads and Pavements.** Elements of highway engineering. Types of roads and pavements, methods of construction and maintenance, jurisprudence, and finance. Prerequisite: C.E. 85. Three lectures. (3; S.) *Stock*
- 124. Street and Highway Traffic Control.** Collection and analysis of traffic data; causes and remedies for traffic congestion and accidents; traffic control devices; illumination of streets and highways; economics and administration of traffic control. Prerequisite: C.E. 120. Three lectures, one lab. (3; F.) *Stock*
- 125. Highway Design.** Theory and practice in the design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisite: C.E. 120. Two lectures, one lab. (3; W.) *Stock*
- 127. City Planning.** Master plans, civic units, parks and playgrounds, utilities, housing, sub-divisions, zoning, civic centers and airports. Three lectures. (3; S.) *Stock*
- 130. Building Construction and Cost Estimating.** Construction methods used in fabrication and erection of buildings and practice in estimating costs. Three lectures. (3; F.) *Kepner*
- 131, 132. Structural Design Problems.** Advanced work in the analysis and design of statically determinate and indeterminate structures. For students desiring to specialize in the structural field. Prerequisite: C.E. 105. Three lectures. (3; W. 3; S.) *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, and measurement of fluid flow. Prerequisites: Physics 20, Math. 99. Two lectures, two labs. (4; F. 4; W.)

Milligan

148. **Hydraulic Machinery.** Hydraulic principles underlying the design and selection of tangential and reaction turbines and centrifugal pumps are studied in this course. Prerequisite: C.E. 142. Two lectures, two labs. (4; S.)

Milligan

150. **Soil Mechanics.** Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and seepage, shear, stress distribution, consolidation and stability as factors in the design of earth structures and foundations. Prerequisites: Math 122, C.E. 103, 142. Three lectures, one lab. (4; F.)

Peterson

171. **Hydrology.** (Primarily for Forestry Students.) Weather elements, factors influencing run-off, and influence of range and land-management practices on run-off and erosion. Three lectures. (3; F.)

Pearson

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 its use in water supply and flood control studies. Prerequisites: C.E. 142, or by special arrangement. Three lectures, one lab. (4; S.)

Milligan

181. **Photogrammetry.** The science or art of utilizing photographs of the earth's surface for making surveys, maps and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: C.E. 63, 81 or 85 or senior standing in Forest, Range, or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3; S.)

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. Two lectures. (2; S.)

Stock

190. **Contracts and Specifications.** Synopsis of the law of contracts. Typical specifications and contracts. Prerequisite: Senior standing in engineering. Three lectures. (3; W.)

Bishop

192. **Engineering Economy.** Financial and cost problems associated with engineering design, operation and construction. The determination of the economic alternative in engineering. Prerequisites: B.A. 100, Econ. 51. Three lectures. (3; W.)

Peterson

193. **Culinary Water Systems.** Elements of design, construction, and maintenance of waterworks systems. Prerequisite: C.E. 142. Three lectures. (3; F.)

Staff

194. **Sewerage.** Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical, and biological action and methods of final disposal. Prerequisites: C.E. 142 and Bact. 70. Three lectures, one lab. (4; W.)

Staff

195. **Sanitary Design.** Principles of design, construction, and maintenance of water purification plants and sewage treatment plants. Problems involving both functional as well as structural design features are included. Prerequisites: C.E. 193, 194. Three lectures, one lab. (4; S.)

Staff

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. (4; W.)

Milligan

197. **Electrical Machinery.** Theory and performance of electrical machinery. Power transmission and distribution. Applications of electrical machinery. Prerequisites: Physics 21 and Math. 99. Three lectures, one lab. (4; F.)

Embry

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. (2; W; 2; S.)

Christiansen

201, 202. **Advanced Structural Theory.** Advanced mechanics of materials, including photo-elastic analysis. Classical and modern theories of indeterminate structure analysis, including model analysis. Theory of limit design. Prerequisite: C.E. 132. Three lectures. (3; F or W.)

Peterson

203. Advanced Structural Design. Design of modern indeterminate structures. Student selects suitable structure for design and proceeds from preliminary planning stage to complete detailing. Prerequisite: C.E. 132. Any quarter. (3) *Peterson*

210. Earth and Rock-Fill Dams. Design of flexible type (earth or rock fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. (3; F.) *Peterson*

211. Masonry Dams. Design of rigid type dams. Stress analysis and design of gravity, gravity arch, single arch, multiple arch, and deck types of masonry dams. Timber, steel, and other miscellaneous types are also considered. Stress and seepage problems in the foundations and abutments and construction details are given special attention. For graduate students and specially prepared seniors. Time arranged. (3; W.) *Peterson*

212. Appurtenances to Dams, and Operation of Reservoirs. Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control, and irrigation use. For graduate students and specially prepared seniors. (3; S.) *Peterson*

215. Hydro-Electric Design. Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. For graduate students and specially prepared seniors. Prerequisite: C.E. 148. Time arranged. (3; S.) *Peterson*

220, 221, 222. Advanced Highway Engineering. Economics of location and design; selection, improvement, and maintenance; traffic control, administration, finance and jurisprudence as applied to highways. Prerequisite: C.E. 125. (3; F. 3; W. 3; S.) *Stock*

241, 242. Advanced Fluid Mechanics and Hydraulics. Dynamic lift and propulsion, flow of viscous fluids, resistance of immersed and floating bodies, compressible fluids, dynamic similarity, and non-uniform flow in open channels. Prerequisites: C.E. 142 and 196, or equivalents. (3; F. 3; W.) *Milligan*

243. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: I.D. 147, C.E. 148, and Math. 122. (3; W.) *Milligan*

250. Advanced Soil Mechanics. Theories of seepage and percolation, salinity, capillarity, stresses in earth masses, consolidation, and stability are developed and applied to the practical solution of engineering design of wells, drains, canals, embankments, foundations, and miscellaneous 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. (3; W.) *Peterson*

298. Graduate Thesis. Two to twelve credits. Each quarter, time arranged. *Staff*

Irrigation and Drainage

J. E. CHRISTIANSEN, C. H. MILLIGAN, O. W. ISRAELSEN, *Professors*; D. F. PETERSON, JR., A. ALVIN BISHOP, *Associate Professors*; GEORGE D. CLYDE, J. H. MAUGHAN, C. W. LAURITZEN, D. K. FUHRIMAN, WILLIS BARRETT, *Collaborators*, U. S. Department of Agriculture.

Both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering, with majors in Irrigation and Drainage, are offered by this department.

The Department also carries on a program of research in collaboration with the Soil Conservation Service and the Bureau of Plant Industry, Soils and Agricultural Engineering, of the U. S. Department of Agriculture, under the direction of the Agricultural Experiment Station. This provides opportunities for qualified students to act as part-time research assistants, and in so doing, to obtain experience and compensation for their services.

Utah State Agricultural College is located in the heart of the irrigated 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.

A joint major in Irrigation and Soils is available for students registering in the School of Agriculture.

IRRIGATION AND DRAINAGE COURSES

10. Irrigation for Agricultural Students. The principles and practices underlying efficient and economic use of water in irrigation, including land preparation, water measurement, irrigation methods, irrigation efficiencies, and simple structures, for the control and measurement of water. Three lectures, one lab. (4; F or S.) *Bishop*

12. Irrigation Practice. Sources and conveyance of irrigation water, from pumping plants, water measurements, preparation of land for irrigation, soil properties and plant characteristics in relation to irrigation, alkali, duty of water, and irrigation efficiencies. Three lectures, one lab. (4; F or S.) *Bishop*

112. Irrigation Principles. Especially for advanced students in Agriculture or Engineering, who have not taken I.D. 10 or 12. Principles of irrigation, including soil, water and plant relations, irrigation methods, irrigation efficiencies, salinity, etc. (3; W.) *Staff*

145. Design of Drainage Systems. Drainage design in relation to soil properties, location of drains, flow into tile, properties of tile, drainage construction. Prerequisites: I.D. 12 and C.E. 142. Two lectures, one lab. (3; S.) *Israelsen*

146. Design of Water Conveyance Irrigation Structures. Application of the principles of solid, fluid, and soil mechanics, to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 106, 142, and 150. Two lectures, one lab. (3; W.) *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. (3; S.) *Bishop*

149. Irrigation Institutions. Laws governing the acquirement, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; Federal legislation affecting water. Three lectures. (3; F.) *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. Three lectures. (3; W.) *Bishop*

212, 213. Problems in Irrigation Agriculture. Advanced work on the major problems in agriculture under irrigation, including management of irrigation projects, consolidation of irrigation companies, formation of soil conservation districts, irrigation efficiencies, erosion control, irrigation and the alkali problem. Instruction in residence or in absentia. Time arranged. Credit according to work done. Each quarter. *Staff*

241. Research in Irrigation and Drainage. The regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student research projects. A qualified student may elect a problem in any phase of irrigation or drainage in civil engineering for study at the College or elsewhere. Results in research may be used in part to meet the requirements of an advanced degree. Credit according to work done. Each quarter. Time arranged. *Staff*

249. Advanced Irrigation Institutions and Management. Problems in laws governing the acquirement and adjudication of water rights, and in the 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. Two to twelve credits. Each quarter. Time arranged. *Staff*

DIVISION OF TECHNOLOGY

ERNEST C. JEPSEN, *Chairman*

The Division of Technology is one of the two divisions in the School of Engineering and Technology. It is composed of seven departments, namely: Aeronautics, Air Conditioning and Refrigeration, Automotive, Industrial Education, Metalwork and Mechanical Drawing, Radio and Electronics, and Woodwork and Building Construction.

Beginning as a Department of Mechanic Arts in 1888, this work has expanded and developed into the present Division of Technology with seven separate Departments. This growth is a result of efforts of this Institution to provide for the "liberal and practical education of the industrial classes" as outlined in the original charter for Land-Grant Colleges and Universities.

This Division, in an attempt to better meet the needs of the students, offers three major programs:

I. Industrial Technology Program. Present day industry requires the services of engineers, technicians, and skilled craftsmen. The Industrial Technology Program is a four-year technical program leading to the degree of Bachelor of Science in Industrial Technology (or Radio Technology). The training provided combines technical knowledge and manual skills with a broad general college education. This program is designed to prepare technicians for technical, supervisory or managerial positions in several fields of modern industry and is an excellent foundation for entrance into industrial Civil Service positions, or for private business. The prescribed curricula under this program are described under the departments in which they are offered.

II. Industrial Education Program. This program, offered by the Department of Industrial Education, is for the professional training of teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and the Summer Session. Completion of the undergraduate curriculum leads to the degree of Bachelor of Science in Industrial Education with majors in Industrial Arts Education for Junior and Senior High School positions, and Trade and Industrial Education for Junior College and Vocational School positions

Graduate work leading to the degree of Master of Science in Industrial Education is also offered.

III. Vocational Technical Program. This program is designed to prepare skilled technicians for modern industry. Completion of the two-year curricula, listed under the departments in which they are offered, leads to a Certificate of Completion in the specific field. This program is briefer, and of a more specialized nature than the degree program.

This program is offered in close cooperation with the State Department of Public Instruction, and with industry. Problems of training and placing of students are considered jointly with advisory committees representing the trade. The instruction covers the practices of industry with emphasis on latest methods, modern equipment, and live productive work. The instructors are men with years of successful trade experience in their field. Each curriculum provides for technical instruction one hour daily, shop and laboratory practice three hours daily, and related courses and electives one or two hours daily.

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 pioneering in this field in its desire to provide the types of training specified in the Morrell Act of 1862, establishing the Land-Grant Colleges.

Aeronautics

H. A. BUNTINE, *Assistant Professor*; LOWELL P. SUMMERS,
LOUIS KLEIN, JR., *Instructors*.

This department offers instruction for the thorough training of skilled aircraft and aircraft engine mechanics and aeronautical technicians.

The Aeronautics Department is a fully certificated Air Agency complying with Civil Aeronautics Authority Regulations, and holds Certificate No. 1175 covering training of combined aircraft and aircraft engine mechanics. The curricula, equipment, and instructors have been properly certified in compliance with regulations for the training of aircraft and aircraft engine mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Aircraft and Aircraft Engine Mechanic Ratings. This training prepares graduates for both aircraft and aircraft engine maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in Aeronautics with a general college education. Training is based upon the objective of scientifically and systematically developing students to a point where they can assume responsible positions in the industry.

Facilities include a new building with complete laboratories and modern equipment for instruction in aircraft engines, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.

The department is equipped with the latest type aircraft, engines and related units necessary for training in these fields. Also included are electroplating, sandblast, magneto and carburetor testing equipment. Training in the aircraft laboratories is supplemented by courses in the Machine Shop, Sheet Metal, Welding and Woodwork offered by the separate departments.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Aeronautics

Freshman

Course	Credits		
	F	W	S
Aero 5, 6, 7	5	5	5
Aero 5a, 6a, 7a	5	5	5
Math. 34, 35, 44	3	5	3
Welding 92, 93	—	3	3
Radio 21	4	—	—
M.S. 1, 2, 3	1	1	1
Electives	—	—	—
	18	19	17

Sophomore

Course	Credits		
	F	W	S
Aero 8, 9, 10	5	5	5
Aero 8a, 9a, 10a	5	5	5
English 17, 18, 19	3	3	3
Metalwork 51b	—	3	—
Mech. Dwg. 91, 92, 93	2	2	2
M.S. 4, 5, 6	1	1	1
Electives	2	—	2
	18	19	18

Junior

Course	Credits		
	F	W	S
Aero 100, 104, 105	3	3	3
Physics 20, 22	5	—	5
Chemistry 10	—	5	—
Mech. Dwg. 95, 96	3	—	3
Metalwork 50	—	3	—
Electives	5	5	5
	16	16	16

Senior

Course	Credits		
	F	W	S
Aero 101, 126, 127	3	2	2
Aero 37, 131	3	—	2
Econ. 125	3	—	—
Bus. Admin. 151, 100, 156	3	3	5
English 111	—	—	4
Zoology 111	—	4	—
Electives	3	6	2
	15	15	15

Two-Year Vocational Technical Program
Certificate of Completion in Aircraft and Engine Mechanics
(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech. Aero 5, 6, 7	5	5	5	Tech. Aero 8, 9, 10	5	5	5
Shop, Aero 5a, 6a, 7a	5	5	5	Shop, Aero 8a, 9a, 10a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, Engl. 17, 18, 19	3	3	3
Radio 21	4	—	—	Metalwork 51b	—	3	—
Welding 92, 93	—	3	3	Mech. Dwg. 91, 92	2	2	—
Electives	—	2	2	Ind. Ed. 21	—	—	3
	—	—	—	Electives	3	—	2
	17	18	18		—	—	—
					18	18	18

DESCRIPTION OF COURSES

5, 5a. Composite Aircraft Structures. (Technical and Shop.) The design, construction, repair and maintenance of composite aircraft, including wood structures, steel structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. Basic related instruction includes airfoils, types of aircraft, aircraft structures, parts and fittings, design factors, methods of fabrication, materials and processes and stress analyses. (Tech. 5; Shop, 5; F.) *Klein*

6, 6a. All-Metal Aircraft Structures. (Technical and Shop.) The design, construction, repair and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. The adaptation of stressed skin aircraft construction; a study of strength, weight and use of aluminum alloys; design factors; methods of fabrication; fittings, forgings, and extrusions; monocoque, and semi-monocoque structures; stress analyses; materials and processes. (Tech. 5; Shop 5; W.) *Klein*

7, 7a. Aircraft Maintenance. (Technical and Shop.) The maintenance, repair and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, 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 included and a thorough study of the operation of an approved Civil Aeronautics Administration Aircraft Repair Station. (Tech. 5; Shop, 5; S.) *Klein*

8, 8a. Aircraft Powerplants. (Technical and Shop.) The repair, maintenance, and operation of modern air cooled and liquid cooled aircraft engines, including design, disassembly and reassembly procedures, special tools and their application, power sections, accessory sections, supercharged sections, cylinders and valve mechanisms, and pertinent Civil Air Regulations. Basic related material includes a study of specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, inspection methods, materials and processes, volumetric efficiency, and compression ratios. (Tech. 5; Shop 5; F.) *Summers*

9, 9a. Aircraft Powerplant Accesories. (Technical and Shop.) The operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel injection systems, lubricating systems, magnetos, generators and voltage control systems, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism, induction systems and superchargers, fuels and lubricants. (Tec. 5; Shop, 5; W.) *Summers*

10, 10a. Aircraft Powerplant Maintenance. (Technical and Shop.) Training in the repair and alteration, maintenance, and operation of modern aircraft powerplants, including periodic inspections, maintenance servicing, diagnosis of engine malfunctioning; engine installation, test and servicing; installation and maintenance of propellers, 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. Related instruction includes the study of the operation of an approved Civil Aeronautics Administration Engine Repair Station. (Tech. 5; Shop, 5; S.) *Summers*

100. Fundamentals of Turbo-Jet Propulsion. History, development and general principles of jet propulsion. Thrust and performance, combustion systems, metallurgy, American, British and foreign gas turbines; aerodynamic problems; application. Prerequisite: 10, 10a. Three lectures. (3; F.) *Buntine*

101. Advanced Engine Operation and Performance. Principles underlying the 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. Three lectures. (3; F.) *Summers*

104. Advanced Aircraft Design and Construction. Study of latest methods in current use for design and manufacturing of stressed skin aircraft. Correlation of design requirements and manufacture. Pertinent Civil Aeronautics Administration Regulations covering design. Three lectures. (3; W.) *Buntine*

105. Aircraft Woods and Plastics. Analysis of woods and plastics as applied to aircraft. Emphasis is placed on investigation and development of methods involving design criteria, applications of elastic theory, and effects upon structural analysis. Two lectures. (2; W.) *Klein*

126. Airline Maintenance and Fixed Base Operations. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Administration; interline agreements; promotion and publicity. Two lectures. (2; W.) *Buntine*

127. Aircraft Communication and Range Techniques. Standard airport control procedures; instrument flight regulations; control tower procedures and flight plans; orientation and beam bracketing; approach procedures and let down. Instruction correlated with link trainer operation. One lecture, 2 2-hour lab. (2; S.) *Buntine*

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2; S.) *Buntine*

131. Time and Motion Study. The techniques of time and motion study and their inter-relationships. Detailed discussion and practice with process charts, multiple-activity charts, micromotion study. Therblig check lists, motion economy and stop watch time study. Methods of application and personnel problems involved. Two lectures. (2; S.) *Klein*

AERONAUTICAL GROUND AND FLIGHT SCHOOL

The Aeronautics Department, in cooperation with the Veterans Administration, provides a co-ordinated Flight Instruction Program for Veterans. It consists of Ground School Courses in the Aeronautics Department at the College and Flight Courses at either of the local airports. This Flight Instruction Program is open to any Veteran approved for flight training in terms of his educational objective. For further information the Veteran should contact the Dean of his school.

Ground School Courses

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to the operation of aircraft, radio, and airway procedures. Two lectures. (2; F, 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. (2; F, W or S.) *Klein*

33. Meteorology. Study of weather, maps, atmosphere, air masses, clouds and weather reports. Required by C.A.A. for any pilot rating above private. Three lectures. (3; F, W or S.) *Buntine*

34. Navigation. The study of maps, charts and other navigational problems. Required by the C.A.A. for any pilot rating above private. Two lectures. (2; F, W or S.) *Buntine*

135. Aeronautical Ground School (Advanced). Intensive course in aircraft, aircraft engines, propellers, construction, inspection, and general maintenance. Prerequisite: Aero 32. Five lectures. (5; W.) *Buntine*

Flight Courses

37. Private Pilot Certificate. Flight School Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for satisfactory completion. Prerequisites: Aero 31 and 32. (3; F, 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. (10; F, 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. (2; F, W or S.) *Staff*

139. Instrument Rating. Flight School (advanced). Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for completion. Prerequisite: Aero 137. (2; F, W or S.) *Staff*

Air Conditioning and Refrigeration

J. C. SHARP, *Assistant Professor*; D. W. MANDER, ANGUS Q. WOODRUFF, *Instructors.*

This department prepares skilled technicians in air conditioning and refrigeration and allied fields, including: (1) winter heating of small commercial buildings and homes; (2) sheet metal work; and (3) domestic appliances.

The courses are arranged to meet the needs of the industry and the requirements of the various national societies interested in air conditioning and refrigeration. A chapter of the Refrigeration Service Engineers Society (an international organization) is established on the campus and majors in this department are afforded the opportunity to join this society.

The air conditioning and refrigeration laboratories contain excellent equipment for the thorough study of domestic and commercial refrigeration, air conditioning, and sheet metal work. They are equipped with the newer type test instruments and tools for the practical and complete testing of all equipment in these fields.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Air Conditioning and Refrigeration

Freshman			Sophomore				
Course	Credits			Course	Credits		
	F	W	S		F	W	S
AC & R 1, 2, 11	5	5	5	AC & R 12, 21, 22	5	5	5
AC & R 1a, 2a, 11a	5	5	5	AC & R 12a, 21a, 22a	5	5	5
Math. 34, 35, 44	3	5	3	English 17, 18, 19	3	3	3
Mech. Dwg. 91, 92	—	2	2	Metalwork 51b	—	—	3
Radio 21	4	—	—	Welding 91	3	—	—
M.S. 1, 2, 3	1	1	1	Sheet Metal 61	—	3	—
	—	—	—	M.S. 4, 5, 6	1	1	1
	18	18	16		—	—	—
					17	17	17

Junior

Course	Credits		
	F	W	S
AC & R 151, 152, 171	3	3	3
Physics 20, 22	5	—	5
Chemistry 10	—	5	—
Econ. 51	—	5	—
Bacteriology 1 & 2	5	—	—
Dairy 101	—	—	5
Electives	3	3	3
	16	16	16

Senior

Course	Credits		
	F	W	S
AC & R 111, 121, 162	3	3	3
Bus. Admin. 151, 100, 156	3	3	5
English 111	4	—	—
Electives	5	10	7
	15	16	15

Two-Year Vocational Technical Program

Certificate of Completion in Air Conditioning and Refrigeration
(Type A Unit Day Trade)

First Year:				Second Year:			
	F	W	S		F	W	S
Tech. AC & R 1, 2, 11	5	5	5	Tech. AC & R 12, 21, 22	5	5	5
Shop, AC & R 1a, 2a, 11a	5	5	5	Shop, AC & R 12a, 21a, 22a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
RA 21, MD 91, 92	4	2	2	AC & R 61	—	3	—
Electives	1	3	3	Ind. Ed. 21	—	—	3
	18	18	18	Electives	3	2	2
					16	18	18

Description of Courses

1, 1a. Basic Refrigeration. (Technical and Shop.) Construction and operation of refrigeration units. The units include compression cycles, compressors, automatic controls, refrigerants and accessories used in refrigeration systems. Fundamental for all students in refrigeration. (Tech. 5; Lab. 5; F.)

Mander and Woodruff

2, 2a. Domestic Refrigeration. (Technical and Shop.) Continuation of 1 and 1a. Component parts are assembled and operated in various domestic boxes. Includes electric motors, hermetic units, absorption cycles, servicing and repair of domestic refrigerators. Prerequisites: 1 and 1a. (Tech. 5; Lab. 5; W.)

Mander and Woodruff

6. Household Refrigeration. Principles and practices in construction, operation, and servicing of modern household refrigerators and home freezer equipment. Includes motors, compressors, freezing units, temperature controls, and cabinets. Open to all college students. One lecture, 2 lab. (3; F, W or S.) *Sharp*

11, 11a. Commercial Refrigeration, Single Systems. (Technical and Shop.) Construction, operation, servicing and repair of single system commercial refrigerators. Includes commercial boxes, commercial compressors, condensers, evaporators, pressure reducing devices, and controls. Emphasizes the calculation and selection of proper size units so that a complete commercial refrigeration system will operate correctly. Commercial refrigerators are studied and tested in actual operation in relation to capacity, efficiency, and operating characteristics. (Tec. 5; Lab. 5; S.)

Mander

12, 12a. Commercial Refrigeration, Multiple Unit. (Technical and Shop.) Construction, operation, servicing and repair of multiple type commercial refrigerators. Includes commercial low side floats, two-temperature valves, electric solenoids, two position and modulating shut-off valves, Temprite valves, pressure controls, and carbonators. Heat pumps are assembled and tested. Multiple units are assembled, run, and tested for the various service problems encountered in commercial servicing of high, medium, and low temperature work. (Tech. 5; Lab. 5; F.)

Mander and Woodruff

21, 21a. Air Conditioning, Domestic Types. (Technical and Shop.) Design, construction, operation, servicing, and repair of domestic air conditioning instruments and equipment. Includes sling psychrometers, psychrometric charts, humidistats, thermostats, evaporative coolers, unit air-conditioners, filters, gauges, hygrometers and anamometers. (Tech. 5; Lab. 5; W.)

Sharp and Woodruff

22, 22a. Air Conditioning, Commercial Types. (Technical and Shop.) Design, construction, operation, servicing, and repair of commercial air conditioning equipment. Includes air conditioning compressors, evaporators, duct work, air conditioning controls, pilot tubes, decibel meters, psychological aids, and comfort charts. A typical commercial air conditioning unit is assembled and used for analyses and correction of operational difficulties encountered in this type of equipment. Prerequisites: AC&R 21 and 61. (Tech. 5; Lab. 5; S.)

Sharp and Woodruff

61. Sheet Metal Work. Principles and practices in the use of the sheet metal tools, equipment, and materials; forming, fabrication, and layout techniques as related to the air conditioning industry and the building trades. Prerequisite: Mech. Dwg. 92. 2 lab. (2; W.)

Staff

111. Low Temperature Refrigeration. Advanced training in the principles, construction, operation and repair of low temperature refrigeration equipment. Prerequisites: AC&R 12 and 12a. 1 lecture, 2 lab. (3; W.)

Sharp

121. Industrial Air Conditioning. Advanced technical training in the principles, construction, operation and repair of industrial air conditioning equipment. Prerequisites: AC&R 22 and 22a. 1 lecture, 2 lab. (3; S.)

Staff

151. Electric Motors. Advanced technical training in the principles, construction, operation and repair of the motors used in air conditioning and refrigeration equipment. Prerequisite: Radio 21. 1 lecture, 2 lab. (3; F.)

Sharp

152. Air Conditioning Electric Circuits. Advanced technical training in the principles, construction, operation and repair of the electric circuits used in air conditioning and refrigeration. Prerequisite: Radio 21. 1 lecture, 2 lab. (3; W.)

Sharp

162. Instrument Technology. Technical training in the principles, operation and repair of pressure and temperature instruments. 1 lecture, 2 lab. (3; S.)

Sharp

171. Application of Thermodynamics. For Air Conditioning and Automotive majors. The applications of the laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigerators is studied. Prerequisites: Math. 35, 44; Physics 22. 3 lecture. (3; S.)

Sharp

191, 192, 193. Advanced Laboratory Work. Advanced laboratory work in the construction, testing, and repair of specialized air conditioning and refrigeration equipment. For junior and senior students majoring in Air Conditioning and Refrigeration. 1 lecture, 2 lab. (3; F, W or S.)

Sharp

Automotive

EDWARD L. FRANCE, *Assistant Professor*; CLYDE HURST, OWEN SLAUGH,
LYNN WILLEY, *Instructors*.

This department offers instruction in Automotive and Diesel Technology; Automotive and Diesel Mechanics; and Auto Body and Paint Reconditioning. It also provides general service courses designed to meet the needs of those who desire a fundamental knowledge of the various phases of the automotive field. These courses, namely: Auto 51, 52, 53, 61, and 162, are open to any college student.

The latest and most modern servicing equipment has been acquired for training purposes. A new Technology building designed especially to train automotive and aeronautics students is under construction and is expected to be available for instruction soon.

The degree of Bachelor of Science in Industrial Technology is offered with majors in Automotive or Diesel Technology. A major in these fields prepares students as automotive or diesel technicians. This major also prepares shop foremen, shop superintendents, and with special preparation, school instructors. These curricula provide an excellent foundation for entrance into Civil Service, private business and managerial positions with large companies or corporations.

Students wishing to better prepare themselves for graduate study at other institutions in Automotive, Diesel or closely allied fields of engineering, may do so by substituting certain engineering courses during their junior and senior years.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Automotive Technology

Freshman

Course	Credits		
	F	W	S
Auto 1, 2, 3	5	5	5
Auto 1a, 2a, 3a	5	5	5
Math. 34, 35, 44	3	5	3
Mech. Dwg. 91, 92	—	2	2
Metalwork 51b	3	—	—
M.S. 1, 2, 3	1	1	1
Electives	—	—	2
	17	18	18

Sophomore

Course	Credits		
	F	W	S
Auto 4, 5, 6	5	5	5
Auto 4a, 5a, 6a	5	5	5
English 17, 18, 19	3	3	3
Radio 21	4	—	—
Econ. 51	—	5	—
Welding 91	—	—	3
M.S. 4, 5, 6	1	1	1
	18	19	17

Junior

Course	Credits		
	F	W	S
Welding 190	3	—	—
Auto 162	—	3	—
AC & R 170	—	—	3
Physics 20, 21, 22	5	5	5
Chemistry 1	5	—	—
Bus. Admin. 100	—	3	—
Metalwork 50	—	3	—
English 111	—	—	4
Electives	3	3	4
	16	17	16

Senior

Course	Credits		
	F	W	S
Auto 151, 152, 153	3	3	3
Zoology 111	—	4	—
Economics 125	3	—	—
Bus. Admin. 151, 152, 156	3	3	5
Ind. Ed. 113	—	—	3
Electives	6	5	4
	15	15	15

For a Major in Diesel Technology, substitute Auto 21 to 23 and 21a to 23a for Auto 1 to 3 and 1a to 3a.

Two-Year Vocational Training Program

Certificate of Completion in Auto Body and Paint Reconditioning

(Type A Unit Day Trade)

First Year:	Credits			Second Year:	Credits		
	F	W	S		F	W	S
Tech. Auto 12, 13, 16	5	5	5	Tech. Auto 11, 15, 14	5	5	5
Shop, Auto 12a, 13a, 16a	5	5	5	Shop, Auto 11a, 15a, 14a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
Welding 91, 94	3	3	—	Mech. Dwg. 91, 92	2	2	—
Forge Prac. 81b	—	—	3	Ind. Ed. 21	—	—	3
Electives	2	2	2	Electives	3	3	2
	18	18	18		18	18	18

Certificate of Completion in Automotive Repair

(Type A Unit Day Trade)

First Year:	Credits			Second Year:	Credits		
	F	W	S		F	W	S
Tech. Auto 1, 2, 3	5	5	5	Tech. Auto 4, 5, 6	5	5	5
Shop, Auto 1a, 2a, 3a	5	5	5	Shop, Auto 4a, 5a, 6a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
Metalwork 51b	3	—	—	Mech. Dwg. 91, 92	2	2	—
Welding 91; Radio 21	—	3	4	Ind. Ed. 21	—	—	3
Electives	2	2	1	Electives	3	3	2
	18	18	18		18	18	18

Certificate of Completion in Diesel and Heavy Duty Mechanics

(Type A Unit Day Trade)

First Year:	F	W	S	Second Year:	F	W	S
Tech. Auto 21, 22, 23	5	5	5	Tech. Auto 4, 5, 6	5	5	5
Shop, Auto 21a, 22a, 23a	5	5	5	Shop, Auto 4a, 5a, 6a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related, English 17, 18, 19	3	3	3
Metalwork 51b	3	—	—	Mech. Dwg. 91, 92	2	2	—
Welding 91; Radio 21	—	3	4	In. Ed. 21	—	—	3
Electives	2	2	1	Electives	3	3	2
	18	18	18		18	18	18

1, 1a. Steering Correction. (Technical and Shop.) The construction, operation, and repair of the parts of the automobile chassis. The units covered are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, wheel balancing, frame straightening, and brakes. Modern methods of repair. (Tech. 5; Shop 5; F.) *Slaugh*

2, 2a. Automotive Engines. (Technical and Shop.) The construction, operation, and repair of the modern automobile engine, including cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. (Tech. 5; Shop, 5; W.) *Slaugh*

3, 3a. Driving Mechanisms. (Technical and Shop.) The construction, operation, and repair of clutches, transmissions, overdrives, universals, drive shafts, differentials, and rear axles. Modern methods of repair. (Tech. 5; Shop, 5; S.) *Slaugh*

4, 4a. Fuel Systems. (Technical and Shop.) The construction, operation and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls, and special devices such as superchargers, governors, and auto diesel engine fuel systems. Modern methods of repair. (Tech. 5; Shop, 5; F.) *France*

5, 5a. Auto Electrics. (Technical and Shop.) The construction, operation and repair of the electric systems used on modern automotive equipment, including the battery, lighting systems, ignition systems, starting and generating systems. Modern methods of repair. (Tech. 5; Shop, 5; W.) *France*

6, 6a. Motor Tune-Up. (Technical and Shop.) Correlates the work covered on engines, carburetion and electrics. Tests for troubles are made with modern tune-up equipment and these troubles remedied by trade-accepted methods. (Tech. 5; Shop, 5; S.) *France*

11, 11a. Chassis Alignment. (Technical and Shop.) The repair and alignment of chassis frames, front and rear axles, wheels, and steering mechanisms. Latest methods are stressed in the checking and correcting of damaged automobile chassis units. (Tech. 5; Shop, 5; F.) *Slaugh*

12, 12a. Fender Reconditioning. (Technical and Shop.) Roughing out, shrinking, leading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfaces. (Tech. 5; Shop, 5; F.) *Willey*

13, 13a. Body Reconditioning. (Technical and Shop.) The construction and repair of automobile bodies. Units include the checking and alignment of automobile bodies and the repair and replacement of damaged body panels, such as the dash, cowl, trunk, rocker, floor, side, top and door panels. (Tech. 5; Shop, 5; W.) *Willey*

14, 14a. Body Mechanisms. (Technical and Shop.) The repair and replacement of modern automobile body mechanisms, including mechanical, electrical, and hydraulic regulating devices, windshield wipers, body wiring, and lights. (Tech. 5; Shop, 5; S.) *Hurst*

15, 15a. Auto Trimming and Upholstering. (Technical and shop.) The repair, cleaning, dyeing and replacement of all auto body upholstery. Units covered are floor coverings, headlinings, door and quarter trim pads, wind

lace and trim mouldings, seat cushions, and sewing machine operation. (Tech. 5; Shop, 5; W.) *Willey*

16, 16a. Automotive Refinishing. (Technical and Shop.) The preparation of body metal and the application of lacquer and synthetic enamels, including metal preparation, priming, surfacing and the application of color. Practice in spotting, striping, and graining. (Tech. 5; Shop, 5; S.) *Willey*

21, 21a. Heavy Duty Chassis. (Technical and Shop.) The construction, operation and repair of automotive diesel and heavy duty chassis. The units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (Tech. 5; Shop, 5; F.) *Hurst*

22, 22a. Automotive Diesel Engines. (Technical and Shop.) The construction, operation and repair of automotive diesel engines, including two-stroke cycle and four-stroke cycle automotive, truck and tractor engines together with their accessories. (Tech. 5; Shop, 5; W.) *Hurst*

23, 23a. Heavy Duty Drives. (Technical and Shop.) The construction, operation and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (Tech. 5; Shop, 5; S.) *Hurst*

51. Automobile Chassis. Principles and practice in the construction, operation, and servicing of the modern automobile chassis. The units of the course include axles, wheel suspension, steering gears, frames, springs, universals, drive shafts and brakes. Open to any college student. 2 lecture, 2 2-hr. lab. (3; F.) *Hurst*

52. Automobile Power Plants. Principles and practice in the construction, operation and servicing of the modern automobile power plant. The units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmissions, overdrives; fuel, cooling and lubrication systems. Open to any college student. 2 lecture, 2 2-hr. lab. (3; F, W or S.) *Slaugh*

53. Automobile Electricity. Principles and practice in the construction, operation, and servicing of the electrical systems used on the modern automobile. The units to be covered include starting, generating, lighting, ignition, and special accessory systems. 2 lecture, 2 2-hr. lab. (3; S.) *France*

61. Body and Fender Repair. Principles and practice in the fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. 2 lecture, 2 2-hr. lab. (3; F.) *Willey*

62. Upholstering. Principles and practice in the repair of modern upholstery. Rebuilding and recovering of automobile upholstery and home furniture. A practical course in upholstery repair. Open to any college student. 2 lecture, 2 2-hr. lab. (3; W.) *Willey*

151. Carburetion. Advanced technical training in fuels and carburetion as applied to the modern automobile, including fuel pumps, carburetors, manifolds and controls. Also principles of combustion, compression and exhaust gas analysis. Prerequisite: Auto 52 or equivalent. 2 lecture, 2 2-hr. lab. (3; F.) *France*

152. Motors and Generators. Advanced technical training in the construction, operation and repair of the automobile starting motor, generator, and their controlling devices. Prerequisite: Auto 53 or equivalent. 2 lecture, 2 2-hr. lab. (3; W.) *France*

153. Magnetos. Advanced technical training in the construction, operation and repair of low and high tension magnetos and their accessories. Prerequisite: Auto 53 or equivalent. 2 lecture, 2 2-hr. Lab. (3; S.) *France*

162. Metal Refinishing. Principles and practice in preparing of metal for refinishing. Fundamental procedures in priming, surfacing, and applying of lacquer and enamel. 2 lecture, 2 2-hr. lab. (3; S.) *Willey*

Industrial Education

ERNEST C. JEPPESEN, *Professor*; WILLIAM E. MORTIMER, *Associate Professor*;
C. D. McBRIDE, EDWARD L. FRANCE, *Assistant Professors*;
BERT V. ALLEN, *Instructor*.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. Students completing their undergraduate work receive a Bachelor of Science degree in Industrial Education, with a major in Industrial Arts Education or Trade and Industrial Education.

The Master of Science degree is offered in Industrial Education with majors in Industrial Arts Education or Trade and Industrial Education. The following courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments: I.E. 102, 104, 107, 109, 110, 111, 120, 121, 123, 124. Courses in the 200 series are intended for graduate work. Registration in these courses requires the approval of the major professor and the instructor concerned.

Industrial Arts Curriculum

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Class A Industrial Arts certificates and is composed of courses in Arts and Sciences, Education, Industrial Arts Technical and Professional, and basic shop skills. The catalog description of each course in the curriculum will be found in the description of courses for each department offering the various courses.

Degree: Bachelor of Science in Industrial Education

Major: Industrial Arts Education

Freshman				Sophomore			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
Math. 35	—	5	—	Physics 3	—	5	—
Botany 1	5	—	—	English 10	5	—	—
Econ. 51	—	—	5	Psychology 3	—	—	5
Mech. Dwg. 91, 92, 93	2	2	2	Ind. Ed. 42, 40	2	—	2
Art 1, 2	—	3	3	Forge Prac. 81a, 84	—	2	2
Woodwork 61, 62	5	5	—	Physiology 4	—	5	—
Metalwork 51	—	—	5	Chemistry 1	5	—	—
M.S. 1, 2, 3	1	1	1	Speech 5	3	—	—
Electives	3	—	—	M.S. 4, 5, 6	1	1	1
	—	—	—	Electives	—	3	6
	16	16	16		16	16	16
Junior				Senior			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
Ind. Ed. 107, 141	3	—	2	Ind. Ed. 123, 110	3	6	3
Ind. Ed. 109	5	—	—	Ind. Ed. 121	—	3	—
Psychology 102	—	—	5	Public Health 155	3	—	—
Art 113, 114	2	3	—	Ind. Ed. 112	—	—	8
English 110	—	4	—	Education 114, 113	3	3	—
Radio 21	4	—	—	Electives	10	4	5
Woodwork 170	—	2	—		16	16	16
Auto 162	—	—	3				
Sociology 70	—	5	—				
Electives	2	2	6				
	16	16	16				

Industrial Arts Courses

40. Sheet Metal. Fundamental operations and tool processes of sheet metal work. Articles are made from black iron, galvanized iron, and bright tin that give practice in pattern developing, cutting, soldering, seaming, riveting, wiring, etc. 2 3-hr. lab. (2; S.) *Mortimer*

42. Plastics. Acquaints students with the new and important group of plastics materials now being produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. 2 3-hr. lab. (2; F.) *Mortimer*

43. Recreational Crafts. Especially for students majoring in recreational leadership. Consists of two parts: (1) planning and organizing craft work as a part of community recreational programs, and (2) laboratory work in various craft fields, such as wood, leather, plastics, archery, metals, etc. 1 lecture, 1 3-hr. lab. (2; F.) *Mortimer*

112. Observation and Directed Teaching. Students observe and teach in Industrial Arts shops near the College. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the State in both junior and senior high schools. (8; W or S.) *Mortimer*

113. Driver Education and Traffic Safety. To acquaint prospective teachers and others with available instructional materials in the field of driver education and the latest methods of presenting such materials in the classroom and on the road. Supervised practice will be arranged for each student. (3; S.) *France*

123. Curriculum Problems in Industrial Arts. To teach prospective junior high school industrial arts instructors the application of skills and knowledge acquired in basic shop courses. Each prospective instructor constructs projects that are suited to the work recommended by the State Department of Education. They also prepare lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisites: Course of Study Building and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. 3 lecture, 5 2-hr. lab. (6; W.) *Mortimer*

141. Art Metalwork. Laboratory work in embossing, sinking, engraving, etching and metal spinning operations. Work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Work 51b. 2 3-hr. lab. (2; S.) *Mortimer*

Trade and Industrial Education Curriculum

Designed primarily for instructors and supervisors in Vocational Technical Education and/or in Vocational Industrial Education Programs. A candidate for this degree must show evidence of successful trade and teaching experience, together with the general education requirements necessary for State Certification in his field. Observation and Directed Teaching in the major and minor fields may be substituted for the teaching experience. The trade and teaching experience must be approved by a committee consisting of the Chairman of the Division of Technology and the Department Heads concerned.

Degree: Bachelor of Science in Industrial Education

Major: Trade and Industrial Education

- A. 48 credits Trade training or equivalent
- B. 49 credits General group and English composition requirements
- C. 33 credits Education and psychology (upper division)
- D. 20 credits Technician training (upper division)
- E. 36 credits Recommended electives (including English 111)
- F. 6 credits MS or PE

192 Total credit hours

Industrial Education Courses

21. Trade Problems. Trade orientation, labor problems, and human relations affecting vocational students and apprentices. Designed especially for students graduating from the Vocational Technical Program. 3 lecture. (3; S.) *Jeppsen*

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, stereoptican projection, recording, sound systems, and other aids suitable for classroom and auditorium use. 3 lecture. (3; arranged.) *Jeppsen*

104, 204. Occupational Analysis. Principles and practice in analyzing occupations for the purpose of determining teaching content. Students complete an analysis of one unit for a trade or occupation. 3 lectures. (3; Arranged.) *Staff*

107. Principles and Objectives of Industrial Education. Acquaints students with the general philosophy and purposes of Industrial Education, and enables them to understand and appreciate its place in the modern educational program. Students study and compare the general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. 3 lectures. (3; F.) *Jeppsen and Mortimer*

109. Course of Study Building in Industrial Education. To teach students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, references, tests, and instructional schedule. Each student completes this work for one unit of instruction. 5 lecture. (5; F.) *Jeppsen*

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. 3 lecture. (3; S.) *Mortimer*

111. The General Shop. Consists of a comprehensive study of the "General Shop" type of organization; its advantages and limitations; the content and organization of subject matter applicable to this type of organization, together with suitable methods for presenting subject matter. Class control and the trends of the program are given consideration. Prerequisite: I.E. 107. 3 lecture. (3; Arranged.) *Staff*

120. Personnel Relations. Training for leadership in industry. Problems in training, organizing, directing, supervising and managing working personnel in work situations. Three lectures. (3; F, W or S.) *McBride*

121. Methods in Industrial Education. The latest methods and techniques of teaching as applied to individual and group instruction in the fields of Industrial Education. Each student has the opportunity of using these different methods in presenting lessons before the class. 3 lecture. (3; W.) *Jeppsen*

124. History of Industrial Education. Deals with the historical developments of manual and industrial education from the early leaders to the present time. Emphasis is given to the influence that various leaders and movements, both in Europe and America, have had upon present day objectives of industrial arts and vocational industrial education. 3 lecture. (3; Arranged.) *Staff*

251. Administration of Industrial Education. The laws, regulations and policies affecting Industrial Education Programs; organization and management necessary for the successful operation of these programs; and pertinent problems and their solutions. Students prepare a plan of administration suitable for their school or district. (3 lecture. (3; Arranged.) *Staff*

252. Supervision of Industrial Education. Latest methods in supervision of Industrial Arts Education and Trade and Industrial Education. For administrators, supervisors, and teachers in service who are responsible for the improvement of industrial arts and vocational education through supervision, or for students who wish to prepare for supervisory work. Students prepare a plan of supervision suitable for their situation. 3 lecture. (3; Arranged.) *Staff*

253. Coordination in Industrial Education. Functions of coordinators in their relationship to the administration and supervision of industrial education programs; responsibilities and duties of coordinators; emphasis on procedures most successful in performance of these duties. 3 lecture. (3; Arranged.) *Staff*

254. Measurements in Industrial Education. Construction and use of the various types of tests and rating scales used in industrial education. Emphasis

is placed upon measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods necessary for an intelligent use of the tests are covered. Prerequisites: Psy. 102. 3 lecture. (3; Arranged.) *Mortimer*

255. Techniques in Writing Instruction Sheets. Principles underlying the development of instruction sheets for use in industrial arts and trade and industrial education programs. 3 lecture. (3; Arranged.) *Staff*

259. Planning and Equipping Industrial Education Buildings. Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. For administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students study the basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to the solution of their own particular problems. 2 lecture, 1 3-hr. lab. (3; Arranged.) *Staff*

260. Diversified Occupations. Content, methods, and special devices to be used in the teaching of Diversified Occupations. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of instruction in Diversified Occupations. 3 lecture. (3; Arranged.) *Staff*

261. Part Time Education. Content, methods, and special devices to be used in Part Time Education programs. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for a course in Part Time Education. 3 lecture. (3; Arranged.) *Staff*

262. Supervisory Personnel Development Institute. An institute for the training of conference leaders, supervisors, and administrative personnel in the methods and techniques of presenting conferences, and personnel training. 3 lecture. (3; Arranged.) *Staff*

263. Evening School Programs. Development, organization and improvement of evening school programs in Industrial Education. Students prepare a syllabus covering the essential materials needed for such a program. 3 lecture. (3; Arranged.) *Staff*

264. Conference Leading. Principles and practice in conference leading as it applies to the methods used in industry. Emphasis given to the preparation, use, and evaluation of this method as it affects Industrial Education Programs. 3 lecture. (3; Arranged.) *Staff*

265. Apprenticeship. Development, organization, and improvement of apprentice training programs for industry. Students prepare a syllabus covering the essential materials needed for a such a program. 3 lecture. (3; Arranged.) *Staff*

266. Related Instruction. Content, methods, and special devices used in teaching related subjects in Vocational programs. Emphasis on pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of Related Instruction. 3 lecture. (3; Arranged.) *Staff*

267. Reading and Conference. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with the approval of the department head, investigation being carried on under the direction of the major professor. (Arranged.) *Staff*

271. Research and Thesis Writing. Provides for individual work in thesis writing in Industrial Education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arranged.) *Staff*

Note: In an effort to be of maximum service to the Industrial Education teachers and supervisors in this Intermountain Region in keeping them current with the national picture in Industrial Education, the Industrial Education Department has organized special courses primarily for these teachers in service as they attend Summer Session to do graduate work. The notation "Arranged—Staff" is made for the specific purpose of bringing in as visiting staff, noted leaders for these courses as the situation demands.

Commercial Photography

BERT V. ALLEN, *Instructor*

Commercial Photography is part of the Industrial Education Department. General service courses are available to college students desiring instruction in the fundamentals of Photography. A special two-year program is available for students wishing to prepare themselves as commercial photographers. Students working toward a Bachelor of Science Degree in Agriculture, Engineering, Forestry, Technology and other specialized fields will find these courses helpful in supplementing their major.

Aerial photography will be offered any quarter as it applies to the course being taught.

Description of Courses

51. General Photography. Principles and practice in the fundamentals of general photography, and the selection and use of cameras, lenses, meters, films, filters, light, developers, and accessories. 2 lecture, 3 1-hr. lab. (3; F, W or S.) *Allen*

61, 61a. Introductory Photography. Taking of still pictures; selection of materials; exposing and developing films; contact printing; enlarging; trimming and mounting. This is the first of a series of six units in commercial photography. (Tech. 4; lab. 4; F or W.) *Allen*

62, 62a. Industrial Photography. News, architectural, and machine photography, including photoflash, interior lighting, action and news, still life, table top, fashion, building, machine, and aerial photography applied to this field. (Tech. 4; lab. 4; W or S.) *Allen*

63, 63a. Agricultural Photography. All types of agricultural, stock, poultry, farm, landscape, garden, flower and plant photography. (Tech. 4; lab. 4; S.) *Allen*

64, 64a. Motion Picture Photography. The care and use of 8mm and 16mm motion picture equipment and materials, films, and filters, composition, exposure, lighting, editing and projection. (Tech. 4; lab. 4; F.) *Allen*

65, 65a. Portrait Photography. Portrait and group photography, including model directing, lighting, posing, head and shoulder, three quarter, full length, and group photography. Considerable emphasis will be placed upon child and home portraiture. (Tech. 4; lab. 4; W.) *Allen*

66, 66a. Color Photography. The use of color cameras, films, filters, and printing processes. Units include introduction, outline and glossary, kodachrome, ektachrome, Ansco color and printing. (Tech. 4; lab. 4; S.) *Allen*

151. Photographic Problems. Special problems in advanced photography designed to meet the needs of individual students in solving advanced photographic problems. (3; Arranged.) *Allen*

Metalwork and Mechanical Drawing

The Department of Metalwork and Mechanical Drawing is composed of four units: Machine Tool Technology, Mechanical Drawing, Welding and Forging. While these units have separate laboratories and are complete within themselves, yet they function together as a coordinated program in Metalwork.

The department, through each of its four units, offers general service courses for students desiring basic instruction in Metalwork. It also offers two-year courses for students preparing to enter the skilled occupations.

The curricula lead to the degree of Bachelor of Science in Industrial Technology, with majors in Machine Tool Technology or Welding. The courses are listed under the separate units of this department.

MACHINE TOOL TECHNOLOGY

AARON NEWAY, *Professor Emeritus*; FREDERICK PREATOR, *Associate Professor*; G. MERRILL SHAW, *Assistant Professor*; W. KARL SOMERS, *Instructor*.

This unit offers a four-year degree program leading to the degree of Bachelor of Science in Industrial Technology. To young men with special

aptitudes in mechanical work, mathematics, and drafting, an excellent opportunity is provided to train for precision tool work, jig and fixture design, tool and gauge making, and tool design. Work taken in this department lays a foundation for work in closely allied fields such as: mechanical inspection, production control, tool planning, tool engineering, or designers in the several branches of engineering.

The machine tool laboratory courses also give excellent training for students who are preparing for a career where mechanical work is needed. Students in engineering, electrical work, auto mechanics, diesel work or work with farm machinery will find these courses suited to their needs.

The machine tool laboratories have a floor space of 5,000 square feet with an additional heat-treating and inspection laboratory. They are equipped with: 25 engine lathes, 3 milling machines, 1 planer, 3 shapers, 4 precision tool grinders, 5 drill presses, 5 tool grinders, 1 Doall machine, 2 punch presses and 1 power hack saw. The laboratory is well supplied with all the necessary hand tools such as vises, bench tools, drills, reamers, gages, taps, dies and micro-meters.

The heat-treating laboratory has 5 electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. The inspection laboratory has precision gage blocks, sine bars, electric comparators, polishing heads, and microscopes for mechanical inspection work.

The degree course places emphasis on training students who will be well prepared to work with experimental problems, mechanical developments, and research. There is an increasing need for well-trained men in these fields.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Machine Tool Technology

Freshman

Course	Credits		
	F	W	S
English 17, 18, 19	3	3	3
Metalwork 51, 52, 53	5	5	5
Math. 34, 35, 44	3	5	3
Mech. Dwg. 91, 92, 93	2	2	2
Speech 5	—	—	3
M.S. 1, 2, 3	1	1	1
Electives	3	2	—
	17	18	17

Sophomore

Course	Credits		
	F	W	S
Math. 97, 98, 99	5	5	5
Chemistry 10, 11	5	5	—
Mech. Dwg. 95;			
Civ. Eng. 63	3	3	—
Metalwork 54b, 57, 151b	3	2	3
Metalwork 58, 50	—	2	3
Econ. 51	—	—	5
M.S. 4, 5, 6	1	1	1
	17	18	17

Junior

Course	Credits		
	F	W	S
Physics 20, 21, 22	5	5	5
Metalwork 151c, 152b, 152c	3	3	3
Physiology 4	5	—	—
Pol. Sci. 12, 13	—	3	3
Woodwork 61b	—	3	—
Welding 91, 94	3	—	3
Bacteriology 155	3	—	—
Electives	—	3	3
	19	17	17

Senior

Course	Credits		
	F	W	S
Metalwork 153, 181, 182	5	5	5
Metalwork 183b	—	—	3
Civ. Eng. 197	—	4	—
Civ. Eng. 101, 102, 103	4	4	4
English 111	—	—	4
Woodwork 160a, 160b	2	3	—
Bus. Admin. 100	3	—	—
Electives	3	—	—
	17	16	16

Two-Year Vocational Training Program
Technical Certificate in Machine Tool Practice

First Year:	F	W	S	Second Year:	F	W	S
English 17, 18, 19	3	3	3	Pol. Sci. 10	5	—	—
Math. 34, 35, 44	3	5	3	Physiology 4	—	5	—
Mech. Dwg. 91, 92, 93	2	2	2	Econ. 51	—	—	5
Speech 5	—	—	3	Metalwork 54, 151, 152	5	5	5
Metalwork 51, 52, 53	5	5	5	Metalwork 57, 50	—	2	3
M.S. 1, 2, 3	1	1	1	Mech. Dwg. 95; Metalwork 58	3	2	—
Electives	3	2	—	Woodwork 61a; Forge Prac. 81a	—	2	—
	—	—	—	Welding 91b	—	—	3
	17	18	17	M.S. 4, 5, 6	1	1	1
					—	—	—
					16	17	17

Description of Courses

Any five credit course in Machine work may be completed by taking part of the course during one quarter and the other part a later quarter. The letters A, B, C, D attached to any five credit course number indicates, respectively, two credits, three credits, three credits and two credits. A and B indicate the first part of the course and C and D the latter part. For example: 51a, two credits; 51b, three credits; 51c, three credits; 51d, two credits.

50. Metals and Heat Treatment. A study of the physical properties, composition, constituents, and heat treatment of metals used in industry. The metals and heat treatment studied include cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. Prerequisite: Chem. 10. (3; S.) *Preator*

51, 52. Machine Tool Practice. Training in the use of hand tools, bench work and tool sharpening, together with training on drill press and engine lathe. Tools and machine parts are made that give practice in operations essential to machine tool work. Included are reading assignments and application of mathematics to machine tool work. (5; F, 5; W.) *Somers*

53, 54. Machine Tool Practice. (Shaper and Milling Machines.) An introduction to work on the shaper, planer, and milling machines. A program is outlined to develop the student's ability on these machines so as to give him a broader training for advanced work. (5; F, W 5; S.) *Preator*

Note: Two and three credit courses in Machine Tool Practice are scheduled each quarter. See Time Schedule Bulletin.

56. Machine Practice for Engineers. To acquaint engineering students with basic machine shop operations, which include the use of hand tools, bench work, tool sharpening, and engine lathe and drill press operation. (2; F, W or S.) *Newey*

57. Precision Inspection. The theory and practice of precision measurement is given in lecture and demonstration. Students learn to use gage blocks, precision measurement equipment, to check calculations, to read material specifications, and to make a complete inspection. Prerequisite: Math. 44. (2; W.) *Preator*

58. Manufacturing Processes. A course to acquaint the student with the fundamentals of important manufacturing processes such as: foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; to know the possibilities and limitations of the processes and their application to the fabrication of industrial products. (2; W.) *Somers*

151, 152. General Machine Work. Advanced lathe, planer and milling machine work, grinding milling cutters, making shop tools, and special shop equipment. Prerequisites: M.W. 51, 52, 53. (5; F, 5; W. or S.) *Somers and Preator*

153. Tool Work. An introduction to tool and die making. The student makes for his own use the specialized and valuable tools and equipment which are necessary for making and assembling the projects in the tool and die courses. Required of all major students. (5; F, W or S.) *Somers*

181, 182, 183. **Tool and Die Making.** Three courses in tool work. Problems in gage making; jig and fixture work, and die work, with design problems. Prerequisites: Mech. Dwg. 95; M.W. 50, 153; Math. 44. (5; F. 5; W. 5; S.)
Preator

MECHANICAL DRAWING

FREDERICK PREATOR, *Associate Professor*;

G. MERRILL SHAW, *Assistant Professor.*

The Mechanical Drawing unit is in the Metalwork Department and offers its service courses in drafting to all departments of the college.

The drafting unit consists of two well-lighted laboratories with a total floor space of 2700 square feet, and is equipped to handle 60 students at individual drafting tables. Modern equipment such as drafting machines, and the different printing machines and printing processes are made available to the students.

The mechanical drawing classes 91, 92 and 93 are basic courses and are offered as a service to all departments. Special emphasis is placed on the fundamentals of good drafting room practices, and on the types of drawings used in industry.

91, 92, 93. Mechanical Drawing. The use of instruments applied to template drawings, graphic solutions, and lettering; standard elements and symbols which make up working drawings used in industry. The theory of shape and its representation in orthographic projections, sections, auxiliary views, revolutions, and size descriptions. Isometric drawings and the translation of orthographic views into pictorial drawings. (2; F. 2; W. 2; S.) *Preator and Shaw*

94. Working Drawings and Specifications. An introduction to architectural drawings and specifications as applied to building and construction problems. Scale drawings including plans, elevations, sections, and construction details are completed with tracings and prints. Prerequisite: 93. (3; F.) *Shaw*

95. Machine Drawing. Problems pertaining to machinery drives and fastenings, mechanisms of power and motion and the design of machine parts incorporating standardized methods consistent with industry. Prerequisite: 93. (3; F or W.) *Preator*

96. Aircraft Drawing. Problems common to aircraft work are used. Special aircraft techniques, numbering systems, change methods, and technical specifications are stressed. Prerequisite: 95. (3; S.) *Preator*

WELDING

A. B. KEMP, *Instructor*

The Welding Unit of the Department of Metalwork and Mechanical Drawing offers progressive instruction in Oxy-Acetylene and Electric-Arc Welding. General service courses are provided for those students wishing a fundamental knowledge of this modern field of industry. Completion of the four-year curriculum leads to the degree of Bachelor of Science in Industrial Technology. This program combines a technical program with a broad general education and prepares students to enter industry as skilled technicians, sales engineers, or to enter the welding business for themselves. A two-year Vocational Technical program is available for students preparing to enter the industry as skilled workers.

Modern industry is teeming with opportunities to apply welding to design, processes, materials, machinery and devices. Welding will play a large part in providing food, clothing, shelter, power, and transportation for future civilization. The extent of this development will depend upon the training and preparation of today's youth for tomorrow's industry.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Welding Technology

Freshman				Sophomore			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
Welding 41, 42, 43	5	5	5	Welding 44, 45, 46	5	5	5
Welding 41a, 42a, 43a	5	5	5	Welding 44a, 45a, 46a	5	5	5
Math. 34, 35, 44	3	5	3	English 17, 18, 19	3	3	3
Forge Prac. 81a	2	—	—	Metalwork 51a, 50	—	2	3
Mech. Dwg. 91, 92, 93	2	2	2	M.S. 4, 5, 6	1	1	1
M.S. 1, 2, 3	1	1	1	Electives	3	2	1
Electives	—	—	1		—	—	—
	18	18	17		17	18	18

Junior				Senior			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
Physics 20, 21, 22	5	5	5	Welding 190, 191, 193	3	3	3
Chemistry 10	5	—	—	C.E. 101, 102, 103	4	4	4
Math. 97, 98, 99	5	5	5	C.E. 197	4	—	—
Zoology 111	—	—	4	English 111	—	—	4
Psychology 3	—	5	—	Bus. Admin. 100	—	3	—
Econ. 125	3	—	—	Electives	5	5	5
Electives	—	2	3		—	—	—
	18	17	17		16	15	16

Two-Year Vocational Technical Program
Technical Certificate in Welding
 (Type A Unit Day Trade)

First Year:				Second Year:			
	F	W	S		F	W	S
Tech. Welding 41, 42, 43	5	5	5	Tech. Welding 44, 45, 46	5	5	5
Shop, Welding 41a, 42a, 43a	5	5	5	Shop, Welding 44a, 45a, 46a	5	5	5
Related, W.W. 6, 7, 8	3	3	3	Related,			
Forge Prac. 81a	2	—	—	English 17, 18, 19	3	3	3
Mech. Dwg. 91, 92	2	2	—	M.W. 51a, 50	—	2	3
Electives	1	3	5	Ind. Ed. 21	—	—	3
	18	18	18	Electives	5	3	—
					18	18	19

Description of Courses

In all of the following courses, various techniques and welding positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

41, 41a. Acetylene Steel Welding. (Technical and Shop.) Training in fusion welding and cutting of mild steel by means of oxy-acetylene welding equipment. (Tech. 5; Shop 5; F.) *Kemp*

42, 42a. Acetylene Cast-Iron Welding. (Technical and Shop.) Training in fusion welding and brazing of cast iron and bronze welding of malleable casting with oxy-acetylene flame. Special problems in the pre-heating of castings are introduced. (Tech. 5; Shop 5; W.) *Kemp*

43, 43a. Acetylene Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, stainless steel, miscellaneous alloys, and non-ferrous metals with the oxy-acetylene and Heli-arc welding equipment. Attention is given to pipe welding, hard surfacing and flame hardening. (Tech. 5; Shop 5; W.) *Kemp*

44, 44a. **Electric Steel Welding.** (Technical and Shop.) Training in fusion welding of mild steel by means of electric-arc welding equipment. (Tech. 5; Shop 5; F.) *Kemp*

45, 45a. **Electric Cast-Iron Welding.** (Technical and Shop.) Training in fusion welding of bronze, cast-iron and malleable castings with the electric-arc. (Tech. 5; Shop 5; W.) *Kemp*

46, 46a. **Electric Aluminum Welding.** (Technical and Shop.) Training in the welding of aluminum, stainless steel, and non-ferrous metals with the electric-arc. Attention is also given pipe welding and hard surfacing. (Tech. 5; Shop 5; S.) *Kemp*

91. **Acetylene Welding.** Principles and practice in the fundamentals of oxy-acetylene welding and cutting. A general course open to all college students. 2 lecture, 2 2-hr. lab. (3; F, W or S.) *Staff*

92. **Aero Welding.** Principles and practice in welding steel and alloy steel tubing as practiced in aircraft construction and repair. Attention will be given to resistance welding. 2 lecture, 2 2-hr. lab. (3; F.) *Staff*

93. **Advanced Aero Welding.** This course is open only to advanced students in aircraft welding and provides instruction pertinent to qualifying for CAA Aircraft Mechanic License. Prerequisite: 92. 2 lecture, 2 2-hr. lab. (3; W.) *Kemp*

94. **Electric Welding.** Principles and practice in the use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc-welding of steels. 2 lecture, 2 2-hr. lab. (3; F, W or S.) *Staff*

96. **Engineers Welding Laboratory.** Exploration in modern welding. Students receive basic instruction and practice in the use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. 2 3-hr. lab. (2; F, W or S.) *Staff*

190. **Advanced Acetylene Welding.** Principles and practice in welding metallurgy pertaining to acetylene welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hard-surfacing and flame hardening. Laboratory welding in vertical and overhead positions, and testing welds by means of the tensile hardness, etching, and microscope. 2 lecture, 2 2-hr. lab. (3; F.) *Kemp*

191. **Advanced Electric Welding.** Principles and practice in welding metallurgy pertaining to electric welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hardsurfacing, and flame hardening. Laboratory welding in vertical and overhead position and testing welds by means of the tensile hardness, etching, and microscope. 2 lecture, 2 2-hr. lab. (3; W.) *Kemp*

193. **Welding Seminar.** Current topics in production methods, cost, design, and manufacture of welded products as used in modern industry. (2; S.) *Kemp*

FORGE PRACTICE

J. DONALD WADSWORTH, *Instructor*

The Forge Practice Unit of the Department of Metalwork and Mechanical Drawing provides general service courses for the various departments on the campus. These courses are in forging, bench metalwork, and ornamental iron work. They are open to all college students.

The Forging Laboratory is equipped with hand tools, shop equipment, and necessary materials for complete work in this field.

Forging is basic to the metal working trades and industries. Its fundamental operations are practiced in fabrication and construction work, maintenance and repair work, and in many forms of manufacturing. Students in Engineering, Technology, Agriculture, and many related fields will profit by basic training in forge practice.

Description of Courses

11. **Forging and Bench Metal Work.** (For Engineering and Agricultural students.) Fundamental operations of forging, such as shaping, bending, forge welding, hardening, and tempering. Use of tools and the fundamental bench operations. 2 lab. (2; F, W or S.) *Wadsworth*

Description of Courses

21. Fundamentals of Electricity. Especially for students majoring in Industrial Arts, Automotive, Refrigeration, Welding, etc., covering basic principles of practical and applied electricity. Principles of Electricity; D. C. and A. C. circuits; power; wire and wiring; motor, generator and transformer principles; batteries; electrical measurements. (4; F.) *Staff*

23. Radio Electricity. Introduction to the fundamentals of electricity; direct current circuits and circuit components; magnets and magnetism. Laboratory work covers soldering, wiring, use of diagrams and radio mechanics. 2 lectures, 1 lab. (3; F.) *Jones*

24. Radio Circuits. A continuation of Radio 23. Fundamentals of alternating currents. A. C. circuits and components. Introduction to vacuum tube principles and applications in radio equipment. Laboratory work includes wiring, diagrams and construction of superheterodyne receivers, power supplies, and amplifiers. 2 lectures, 1 lab. (3; W.) *Jones*

25. Receivers and Transmitters. An introduction to the general principles of radio communication systems, receivers, transmitters and antennas. Laboratory work covers the construction, operation and adjustment of the fundamental units. 2 lectures, 1 lab. (3; S.) *Jones*

31, 32, 33. Code Practice. These courses will train the beginner to send and receive correctly 15 to 20 words per minute. The actual speed attained will depend on individual ability. Required of all students majoring in Radio. (1; F. 1; W. 1; S.) *Staff*

80. Direct Current Circuits. Applications of Ohm's Law, Kirchhoff's laws and network theorems to the solution of simple and complex resistive circuits; L-R and C-R circuit analysis; resistive matching networks. (5; F.) *Jones*

81. Alternating Current Circuits. Fundamentals of alternating currents; application of vector algebra to the solution of AC circuits; application of network theorems to AC circuit problems; resonant circuits; introduction to reactive matching networks; graphical analysis of complex waves. Prerequisite: RA 80. (5; W.) *Jones*

82. Electron Tubes. Fundamentals of thermionic emission and operation of vacuum and gas filled tubes; basic principles of electron tube circuits and methods of analysis; applications of electron tubes in radio equipment; measurements and testing in electronic circuits; power supplies. Prerequisite: RA 80. 3 lectures, 2 labs. (5; S.) *Jones*

88. Forest Service Radio and Telephone. A service course for forestry students. Proper methods of operating procedure; installation and elements of maintenance of telephone and radio equipment. Laboratory work is done in the field using standard forest service telephone and radio equipment. (2; S.) *Staff*

110. Communication Circuits. Principles and characteristics of transmission lines, networks, matching sections and filters used in communication systems. Prerequisite: RA 80. 4 lectures, 1 lab. (5; S.) *Cole*

120. Antennas. Fundamentals of radio antennas, radiation and wave propagation; adjustment and construction of all types of antennas; directional arrays; feeder lines and matching networks; antenna and field strength measurements. Prerequisite: RA 110. 3 lectures, 2 labs. (5; F.) *Clark*

125. Audio Frequency Amplification. Principles, characteristics, and construction of resistance, impedance, and transformer coupled audio amplifiers; audio circuit constants and measurements; Class A, AB and B power amplifiers. Prerequisite: RA 82. 3 lectures, 2 labs. (5; F.) *Cole*

126. Radio Frequency Amplification. Principles, characteristics, and construction of R. F. voltage and power amplifiers; neutralization and adjustments; modulation; R. F. circuit constants; oscillators and detectors. Prerequisite: RA 82. 3 lectures, 2 labs. (5; W.) *Clark*

129. Electroacoustics. Elements of acoustics; acoustic problems of studios and auditoriums. Principles and characteristics of loud speakers, microphones and pickups. Principles and operation of disc, wire and tape recorders. Studio consoles; mixers, equalizers and amplifier compensation; measurements and testing of audio and sound equipment. Prerequisite: RA 125. 3 lectures, 2 labs. (5; W.) *Cole*

140. UHF Circuits. Complex wave analysis; wide band amplifiers; square
 141. UHF Techniques. UHF generators; cavity resonators; wave guides; parabolic and horn radiators; applications of UHF to radar and other complete systems. Laboratory facilities include a new and complete mark 16 navy radar in the 10 cm region. Prerequisite: RA 140. 3 lectures, 2 labs. (5; S.)
Clark

150, 151, 152, 153, 154. Advanced Laboratory Work. Advanced radio laboratory work in construction of equipment and communication units; measurements and laboratory techniques. Prerequisite: RA 125, 126. (2; F. 2; W. 2; S.)
Cole, Clark

160. Industrial Electronics. The application of electronic methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms; R. F. heating. Prerequisites: RA 125, 126. 2 lectures, 1 lab. (3; S.)
Clark

175, 176, 177. Radio Seminar. A weekly meeting of staff and senior Radio majors. Reports and discussions on recent developments in the fields of communications and electronics. (1; F. 1; W. 1; S.)
Staff

Woodwork and Building Construction

D. A. SWENSON, *Professor Emeritus*; JOSEPH COULAM, WILLIAM E. MORTIMER, *Associate Professors*; CHARLES N. MERKLEY, *Assistant Professor*; ROSS A. NYMAN, *Instructor*;

This department offers work in joinery and millwork, building construction, estimating and contracting, pattern making, wood turning, wood finishing home mechanics, and cabinet work. It offers a curriculum leading to the degree of Bachelor of Science in Industrial Technology with a major in Building Construction; a two-year terminal course in Carpentry and Building Construction; and general service courses that may be used toward satisfying the curriculum in Industrial Arts.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
 Major: Building Construction

Freshman				Sophomore			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
English 17, 18, 19	3	3	3	Drawing 94	3	—	—
Mech. Dwg. 91, 92, 93	2	2	2	Civ. Eng. 84, Econ. 51	3	—	5
Math. 34, 35, 44	3	5	3	Art 22	—	3	—
Woodwork 61, 62, 63	5	5	5	Woodwork 60	—	2	—
Radio 21	4	—	—	Woodwork 64a, 65a, 66a	3	3	3
Woodwork 68	—	3	—	Woodwork 64, 65, 66	5	5	5
Woodwork 70	—	—	2	Woodwork 72, 73	2	—	3
M.S. 1, 2, 3	1	1	1	Air Cond. & Refrig. 61	—	2	—
Electives	—	—	2	M.S. 4, 5, 6	1	1	1
	—	—	—	Electives	—	2	—
	18	19	18		17	18	17

Junior				Senior			
Course	Credits			Course	Credits		
	F	W	S		F	W	S
Physics 20, 22	5	—	5	Woodwork 171, 172	5	5	—
Chemistry 10	—	5	—	Forestry 130	—	—	4
Forestry 126	3	—	—	Econ. 125	3	—	—
Woodwork 161, 162, 163	5	5	5	History 135	—	—	5
Bus. Admin. 100	—	3	—	English 111	4	—	—
Electives	5	5	8	Zoology 111	—	4	—
	—	—	—	Electives	6	9	9
	18	18	18		18	18	18

Two-Year Vocational Technical Program
 Technical Certificate in Carpentry
 Type A General Industry

First Year:	F	W	S	Second Year:	F	W	S
Tech, R.A. 21, W.W. 68, 73	4	3	3	Tech. W.W. 64a, 65a, 66a	3	3	3
W.W. 70, A.C.&R. 62	2	2	—	W.W. 72, 60, 171a	2	2	2
Forge Prac. 81a	—	—	2	Shop, W.W. 64, 65, 66	5	5	5
Shop, W.W. 61, 62, 63	5	5	5	Related, English 17, 18 19	3	3	3
Related, W.W. 6, 7, 8	3	3	3	M.D. 94, Art 22	3	3	—
M.D. 91, 92, 93	2	2	2	Ind. Ed. 21	—	—	2
Electives	2	3	3	Electives	2	2	2
	18	18	18		18	18	18

Description of Courses

Courses W.W. 61, 62, 63, 74, 160, 171, 172, 173 may be completed by taking part of the course during one quarter and the other part during a later quarter. The letters A, B, C, D are used to designate the subdivision of these courses. Thus, A represents the first two credits of the course; B represents the first three credits; C, the last three credits, and D, the last two credits. The three-hour courses are offered 9-12 M. W. F. each quarter, and the two-hour courses are offered 9-12 T. Th. each quarter.

6, 7, 8. Shop Problems. Shop mathematics, with emphasis upon the use of fractions, decimals, the metric system, percentage, and ratio and proportion, showing their application in the solution of shop problems. Applied geometry problems, areas, volumes, speed relations, cutting speeds, thread and gear calculations, flooring, roofing, board measure, the use of the steel square, estimating the cost of materials. 3 lecture. (3; F, W or S.) *Coulam, Mortimer, and Nyman*

60. Elements of Plumbing. Includes plumbing specifications, codes, lay-outs, installations, inspections, cutting and fitting pipe, and repairs. 1 lecture, 1 lab. (2; W.) *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 a study of the proper use, care and sharpening of hand tools, machine processes, safety measures, machine operation, care and repair of machines, and sharpening of machine cutters. Assigned reading and application of mathematics to woodwork problems. Projects in bench work and wood turning to give practice in the fundamentals of wood construction. 5 lab. (2, 3 or 5; F. 2, 3 or 5; W. 2, 3 or 5; S.) *Swenson and Nyman*

64, 64a; 65, 65a; 66, 66a. Building Construction. (Technical and Lab.) Laying out and construction of homes, farm buildings, garages, etc., 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. 3 lectures, 5 labs. (3 and 5; F. 3 and 5; W. 3 and 5; S.) *Merkley*

67. Woodwork for Engineers. Fundamental operations of woodworking. Includes the use, care and sharpening of hand tools and power woodworking equipment, shop safety, lumber grading and its use, reading and use of the steel square. Also wood construction engineering, 2 or 3 labs. (2; F, W or S.) *Nyman*

68. House Wiring. For students in building construction courses. Covers the national electrical code and the local codes in Utah communities. Includes the choice of materials, design of circuits and inspection for electrical heat, light, and power installation in homes and small public buildings. 2 lectures, 1 lab. (3; W.) *Staff*

72. Concrete and Clay Products. Composition of concrete for various purposes, the use and placement of reinforcing agents; waterproofing, coloring, and stone imitation, etc. Composition of bricks, tile, etc., and their strength and thermal conductivity are also studied. Projects are built in the laboratory during the course. 1 lecture, 1 lab. (2; W.) *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 the building trades. 3 lectures. (3; S.) *Coulam and 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 will receive attention. Minor repairs to heating, ventilating and refrigeration equipment will also be considered. Open to men and women students. Prerequisite: High school physics or equivalent. 5 lab. (2-5; F, W or S.) *Swenson*

160. Pattern Making. Essentials of pattern making. Simple patterns illustrating construction and choice of materials, principles of shrinkage, etc. Prerequisite: W.W. 61. 5 lab. (5; F, 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. Prerequisite: W.W. 66, Mech. Dwg. 94. 3 lectures, 2 lab. (5*; F. 5; W. 5; S.) *Coulam*

70 or 170. Wood Finishing and House Decorating. Fine wood finishing such as natural finishes, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, stucco paints, etc. Students are required to do practice work in each type of finishing. 1 lecture, 1 lab. (2; F, W or S.) *Swenson, Mortimer, Nyman*

171, 172, 173. Cabinet Work. The design and construction of furniture and cabinets, including a study of the woods suitable for furniture and cabinet making, wood turning, inlaying, and types of wood finishing. Projects are built which include inlaying and overlaying. Prerequisite: W.W. 63. All lab. (5; F. 5; W. 5; S.) *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. 2 3-hr. lab. (3; F.) *Mortimer*

*Where requirements for the lab are met under another course, 3 credits for lecture only.

SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT

LEWIS M. TURNER, *Dean.*

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General Information

THE favorable geographical location of this School of Forest, Range, and Wildlife Management, the opportunity for self help for qualified men and great need for better management of the forest, range and game, provide an excellent combination of circumstances and opportunities for proper training in the management of wild lands and their resources.

Naturally-vegetated lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range and soil conservation problems; all offer study projects and opportunities for demonstration. Herds of elk and deer come within a short distance of the campus during the winter.

The Wildlife Management department is greatly enhanced through the establishment of a research agency of the U. S. Fish and Wildlife Service on the campus, which is housed in the forestry building. One of the ten Federal Wildlife Research Units, a cooperative project with the college, the Utah Fish and Game Department, the U. S. Fish and Wildlife Service, and the American Wildlife Institute is located here under the leadership of Dr. J. B. Low. Representatives of this agency assist in class and laboratory instruction, and aid in directing the research of graduate students. Graduate fellowships in Wildlife Management have been made available through the Wildlife Research Unit.

The comparative newness of the fields of forestry, range, wildlife, soil conservation, watershed management and forest recreation, and the unquestioned need for their correlation in permanent wild land management, present excellent opportunities for those desiring to participate in these fields of public service. The purpose stressed is the handling of wild lands so that they may be of continuing benefit for the present and future generations of citizens.

RECOMMENDED ENTRANCE QUALIFICATIONS

Students entering the School of Forest, Range, and Wildlife Management will make more satisfactory progress if they have had high school algebra, chemistry, physics, typing, botany, zoology, and geometry. If the student, for example, has not had high school algebra, he will be required to make up that deficiency in college. It is, therefore, recommended that these basic mathematics and science courses be taken in high school.

COURSES OF STUDY

The curriculum of this school is designed to train men for private, federal government or state work in (1) Forest Management, (2) Range Management, and (3) Wildlife Management. Forest management majors may choose between two options; one designed to train for general forestry work in the West, and one for strict timber management. The range majors may choose, in the senior year, to specialize either in range management or soil conservation. Wildlife management majors may select a course to train for general administrative work with big game and related problems, or a course in general wildlife management with considerable emphasis on small game, fish and other aquatic life.

FIVE-YEAR COURSE RECOMMENDED

The efficient management of wild land resources in all its phases requires a broad fundamental knowledge of many of the sciences and arts. For this reason, many of the forest schools throughout the nation have recognized that the usual four-year program of study is inadequate to give the student sufficient training in both the basic sciences and in the technical subjects of the chosen field. It is therefore recommended that a five-year course of study be pursued.

The first two years of the regular four-year course of study are practically the same in all departments, with specialization in a major field beginning in the third or junior year. This program gives the student only a minimum of

basic training and cultural foundation. The five-year program would provide for an additional year devoted principally to general training in supporting arts and sciences. This would furnish a better foundation for the technical studies of the last two years and a superior cultural background which is so necessary for advancement in public service fields.

SUMMER CAMP

The School of Forest, Range, and Wildlife Management has purchased and leased 3,000 acres of forest and range land approximately 22 miles from the campus within the Cache National Forest, where summer camp facilities have been established. Field instruction is required for graduation in addition to the regular 12 quarters of classroom work. Also, at least one summer season of field experience with a recognized conservation agency is expected of all students.

Attendance at the camp is required between the sophomore and junior years. The summer camp opens on the second Monday, following the close of the spring quarter and continues for a period of 11 weeks. Fifteen credits are allowed for the complete course. In addition to the regular summer school fees, a \$5.00 fee is charged for each of the five courses, and board is provided on a cost basis. All junior college students planning on entering this school at the beginning of their junior year, should make arrangements to attend the camp during the summer following their graduation from the junior college. To be eligible to attend camp however, the requirements of the freshman and sophomore year as outlined on page 204 essentially must be fulfilled. Successful completion of the summer camp courses will be prerequisite to all of the professional work of the junior year.

FIELD TRIPS

A schedule of field trips is planned each year as a part of the regular class instruction. Courses with field trips are so designated under course descriptions. The total expense on this account varies between \$1 and \$5 during any one quarter.

In addition to the trips scheduled for the individual courses, each department conducts an extensive field problems trip in the spring quarter, covering all available branches of the major field. This trip is required of all seniors prior to graduation. The trip for wildlife majors is usually scheduled over the first week of May, and range majors over the second week. The trip for forestry majors is more extensive and covers a period of ten days or two weeks just prior to the end of the spring quarter. Each student pays his share of the cost of the trip. A fee of about \$35.00 is charged each student to defray the general expenses of the trip.

SCHOLARSHIP

A high standard of scholarship must be maintained by the student interested in forestry or the associated fields because of the technical nature of the work and the high professional standards and the character of the Civil Service examinations that are required for federal service. A student is required to maintain a C or better average to remain in the school.

GENERAL REQUIREMENTS

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management.

A. At least 207 credits (quarter hours) exclusive of basic Military Science and Physical Education.

B. Fifteen of the 207 credits must be earned at Summer Camp.

C. All courses prescribed under the study program of the chosen major.

D. All of the following general requirements:

1. English and Speech, 16 credits, of which at least 3 must be Speech.
2. Social Science—8 credits.
3. Military Science or Physical Education—6 quarters.¹

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
¹ Military Science 1, 2, 3, . . .	1	1	1	¹ 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 . . .	4	2	—
² Mathematics 34, 35, 44 . . .	3	5	3	Physics 6	5	—	—
Speech 5	—	—	3	Agronomy 58	—	—	5
Forestry 1	3	—	—	Economics 51	—	5	—
³ Animal Husbandry 1	—	3	—	⁵ Geology 3	—	5	—
⁴ Animal Husbandry 5	—	—	1	⁶ Botany 120	—	—	5
				⁷ Zoology 3, 4	5	5	—
				⁸ Animal Husbandry 10	—	—	5

SUMMER CAMP

Required courses at summer camp follow:

Forestry 90	Forest Improvements	3
Forestry 96	Forest Surveying	3
Forestry 97	Forest Practice	3
Range Management 98	Range Practice	3
Wildlife Management 99	Wildlife Practice	3

Forest Management

LEWIS M. TURNER, *Professor and Head of Department*; J. W. FLOYD,
T. W. DANIEL, *Professors*; C. M. BOWEN, *Associate Professor*;
R. R. MOORE, *Assistant Professor*.

Upon completion of the curriculum prescribed below, students are granted the degree of Bachelor of Science in Forest Management. This course is designed to give the student comprehensive training in all branches of forestry, including growing, protecting, harvesting and utilization of timber crops. Two courses are offered by this department. It is desirable that the student know by the end of his sophomore year which course he will follow. The first option is in general forestry. This provides adequate training in forest management, and in addition some training is provided in range management, wildlife management, and recreation and watershed management. This type of curriculum is considered adapted to the needs of the personnel of the public land managing agencies in the Intermountain region and, in fact, throughout most of the western states. The second option is timber management. This course provides major emphasis on the growing, harvesting, and utilizing of timber crops.

It is highly desirable that every student engage in field work related to forestry in the summer following the freshman and junior years. Students are urged to secure employment with such agencies as the Forest Service, Park Service, or comparable state agency, or in private forest industries. The school maintains an employment service to aid students in securing such summer work.

Electives: Electives necessary to fill out the program of the Junior College years should be chosen with the object of improving the students' cultural as well as professional background. In the junior and senior years electives should be chosen with the object of broadening a specific field of study. Courses selected must meet the approval of the major professor.

¹Not required of ex-military service personnel.

²Students presenting 1½ units of high school algebra or otherwise qualified to take Math. 35 are not required to take Math. 34.

³Required only of students taking the general forestry option.

⁴Required of range majors and students taking the general forestry option.

⁵Required of forest and range management majors only.

⁶Required in the sophomore year of forestry majors only.

⁷Required of wildlife majors only.

⁸Required of range majors excepting soil conservation students.

The degree of Master of Science in Forest Management will be given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. One to two years may be required depending on the ability of the student, the adequacy of his background, and his thesis problem. At present, students will be accepted for candidacy for the M.S. degree in forest management only if they already have the Bachelor of Science degree in forestry.

Several teaching assistantships are available to graduate students in Forest management.

FOREST MANAGEMENT

Freshman and Sophomore Years — See Basic Courses

A. General Forestry

Junior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Measurements I, II	Forestry		106	107		4	4
Dendrology I, II	Forestry	112	113		3	2	
Silverculture I, II	Forestry		114	115		3	3
Forest Protection I	Forestry	118			3		
*Forest Protection II	Forestry			119			3
Public Land Administration	Forestry		132			3	
Plant Ecology	Range	126			5		
Range Management	Range	162			5		
General Wildlife Management	Wildlife			150			5

Senior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Forest Management	Forestry	121			4		
Forest Finance	Forestry		122			4	
Wood Technology	Forestry	126			3		
Forest Policy and Economics	Forestry	133			3		
Improvements and Recreation	Forestry			137			3
Forest Seminar	Forestry		142			2	
*Range Forage	Range		176			4	
*Watershed Management	Range	180			4		
Technical Writing ¹	English			111			4
Senior Field Problems	Forestry			146			1

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 major are Forestry 130, and for the timber management option, Forestry 117, Accounting 133, and Engineering 67.

¹English 110 can be substituted for English 111.

Description of Courses

- 1. General Forestry.** A general survey of the profession 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. (3; F.) *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. Not open to School of Forestry majors. (2; W.) *Floyd*
- 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. (3; W.) *Kelker*
- 90. Forest Improvements.** Practical field problems in trail and telephone construction, the use of field radios, methods of fire prevention, detection and suppression. Care and use of woods, tools and horses in forest, range, and wildlife work. Problems in construction, planning recreational areas and water development. Interpretation of forest and range soils. Lab. fee \$5.00. Summer Camp. (3) *Floyd and Turner*
- 96. Forest Surveying.** Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Type mapping Lab. fee \$5.00. Summer Camp. (3) *Floyd and Daniel*
- 97. Forest Practice.** Study of timber types and successional stages. Timber cruising, log scaling, inventories and growth of immature stands; stem analysis, taper measurements, sample plots, milling and utilization studies. Lab. fee \$5.00. Summer Camp. (3) *Bowen or Daniel*
- 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. (3; F.) *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. (3; W.) *Bowen*
- 106. Forest Measurements I.** Measurements of timber in the log, the tree, and the stand. Log logs and volume tables. Timber cruising practices. Prerequisite, summer camp. (4; W.) *Bowen*
- 107. Forest Measurements II.** Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all-aged, and seedling cut over stands. Prerequisite: For. 106. (4; S.) *Bowen*
- 112. Dendrology I.** Hardwoods. Identification, distribution, and silvics of the more important forest trees in the U. S. (3; F.) *Daniel*
- 113. Dendrology II.** Conifers. Identification, distribution and silvics of the more important forest trees in the U. S. (2; W.) *Daniel*
- 114. Silviculture I.** Characteristics of the tree species which influence the silviculture practice in the United States. Prerequisites: Range 126 and Botany 120. (3; W.) *Daniel*
- 115. Silviculture II.** Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: For. 114. (3; S.) *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. (2; S.) *Daniel*
- 117. Advanced Silvics and Silviculture.** Growth, transpiration. Intensive study of a few major forest types. Prerequisite for 115. (3; S.) *Daniel*
- 118. Forest Protection I.** Prevention, presuppression and suppression of forest and range fires. Economics and physical effects. (3; F.) *Floyd*
- 119. Forest Protection II.** Problems of administration and economics in protecting forests from biological enemies. (3; S.) *Staff*

121. **Forest Management.** Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. Prerequisites: For. 106, 107, 115. (4; F.) *Moore*
122. **Forest Finance.** Financial aspects of forest management, such as land, growing stock and stumpage valuation, forest taxation and damage appraisal. Prerequisite: For. 121. (4; W.) *Moore*
125. **Logging.** Methods of handling timber from tree to mill in the various forest regions. (3; F.) *Moore*
126. **Wood Technology.** Structure and identification of the economic woods of the United States. (3; F.) *Bowen*
129. **Mechanical Properties.** A study of the factors affecting the strength of wood. (2; W.) *Bowen*
130. **Milling and Products.** Manufacturing, grading, seasoning, and preserving lumber, including a study of the wood using industries and their products. (4; S.) *Bowen*
132. **Public Land Administration.** History, organization and functions of conservation agencies affecting range, forest and wildlife administration. (3; W.) *Floyd*
133. **Forest Policy and Economics.** Development of Federal, State and private forest policy. Economic problems in the production, distribution and consumption of forest products. (3; W.) *Floyd*
137. **Improvements and Recreation.** Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and development of areas suitable for this purpose. (3; S.) *Floyd*
138. **Recreational Planning.** Mapping and designing plans for the various forms of forest recreational use. (3; S.) *Floyd*
142. **Forestry Seminar.** Review and discussion of current forestry problems and practices. (2; W.) *Turner*
145. **Forest Problems.** Individual study and research upon a selected forestry problem approved by the instructor. (1-3; F, W or S.) *Staff*
146. **Senior Field Problems.** Study of forest operations. (1; S.) *Senior Staff*
- 201, 202, 203. **Advanced Forestry Seminar.** Review and discussion of more advanced current literature. For students in the graduate school. (1; F. W. S.) *Turner*
204. **Forest Ecology.** Study of the historical and present distribution of forest species and forest types and the physical-biological basis of distribution. (3; W.) *Turner*
205. **Silviculture.** Advanced treatment of silvics and silviculture with emphasis on the physiological aspects of the subject. (3; W.) *Daniel*
206. **Forest Management.** Application of forest management principles; forest organization and development; forest regulation and sustained yield; management principles and control of operations. (2; F.) *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. (2; W.) *Moore*
208. **Forest Measurements.** Application of statistical measurements to forest problems. (3; F.) *Bowen*
209. **Forest Economics.** Study of economics of a private forest enterprise, including the economics of production, manufacture and marketing. (3; F.) *Floyd*
210. **Forest Problems.** Individual advanced study upon a selected forestry problem. (2-10 credits.) *Staff*
211. **Thesis.** Original research on a problem in forest management to be concluded by preparation of a thesis. (10-15 credits.) *Staff*

Range Management

L. A. STODDART, *Professor and Head of Department*; ARTHUR D. SMITH, *Associate Professor*; C. WAYNE COOK, WALLACE R. HANSON, *Assistant Professors*.

The course in range management acquaints the student with methods of maintaining the production of native lands and methods of managing range livestock. An opportunity is given to take special instruction in soil conservation and watershed management.

The degree of Master of Science in Range Management will be granted upon completion of an arranged course of study. Students desiring this advanced work should obtain permission from the major professor at least twelve months before the degree is to be granted, at which time a program of research and study will be outlined. Adequate facilities are available to allow emphasis upon soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in range management or a related subject is prerequisite.

Several assistantships are available annually for students doing graduate work in range management. For information concerning these, prospective students should consult the department head.

COURSE OF STUDY

Freshman and Sophomore

Students majoring in range management will take the freshman and sophomore study as outlined for the School of Forestry (page 200).

Junior		F	W	S
*Botany 108	Agrostology	—	4	—
Range 126	Plant Ecology	—	—	5
Range 162	Range Management	—	—	4
Wildlife 150	General Wildlife Management	5	—	—
*Range 177	Forbs and Browse	2	—	—
*Range 179	Poisonous Plants	—	—	2
Forestry 132	Public Land Adm.	—	3	—
*A. H. 110, 125	Beef Production, Sheep Production	3	3	—
Botany 120	Plant Physiology	—	5	—
Senior		F	W	S
Range 164	Advanced Range Management	—	3	—
*Range 181	Range Economics	—	3	—
Range 192, 193, 194	Range Seminar	1	1	1
English 111	Technical Writing	—	—	4
*Forestry 101, 102	Forest Survey	3	3	—
Range 180	Watershed Management	4	—	—
Range 196	Senior Field Problems	—	—	1
Suggested Electives		F	W	S
A. H. 15	Fundamentals of Animal Breeding	3	—	—
Agron. 115a, 115b	Biometry	3	3	—
Agron. 114	Soil Survey and Land Classification	—	—	3
W. L. 155	Economic Wildlife	—	3	—
For. 118	Forest Protection	3	—	—
Agron. 103	Forage Crops	—	—	4
Ag. Econ. 106	Land Economics and Utilization	—	—	5
Vet. Sci. 10	Animal Hygiene	—	4	or 4
Agron. 155	Soil and Plant Relations	—	3	—
Bot. 121	Water Relations of Native Plants	—	3	—
Geol. 115	Adv. Physical Geology	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 A.H. 10 in the Sophomore year.

	F	W	S
Agronomy 103	—	—	4
Agronomy 125	—	—	3
Ag. Eng. 108	—	4	—
Geology 115	5	—	—
C. Eng. 171	3	—	—
Range 176	—	4	—
Botany 121	—	3	—
Agronomy 114	—	—	3
Physics 114	—	3	—

MINOR—RANGE MANAGEMENT

The following courses are suggested for students wishing to minor in Range Management. The requirements are subject to change upon approval of the department head.

Range 126	Plant Ecology	5 credits
Range 160	Principles of Managing Range Lands	5 "
Range 176	Range Forage Plants	4 "
Range 181	Range Economics	3 "
Range 192, 193, 194	Range Seminar	3 "

Description of Courses

98. Range Practice. Field work in range management involving training in making range reconnaissance, estimating utilization, conducting technical range research, range improvement and management planning. Lab. fee \$5.00. Summer camp. (3) *Smith*

126. Plant Ecology. An analysis of habitat factors as they influence plant growth and distribution. Attention will be given to plant succession and competition and to detailed methods of studying and mapping vegetation. Prerequisites: Botany 30; Agronomy 56 or 58. (5; F and 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. Prerequisite: Botany 25 or Botany 12. 4 lectures, 1 lab. (5; S.) *Cook*

162. Range Management. A technical course dealing with problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisites: Botany 30 and Range 98. (5; F.) *Cook*

164. Advanced Range. Technical problems in range management. Prerequisites: Range 126 and 162. (3; W.) *Stoddart*

176. Range Forage Plants. Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Prerequisite: Botany 30. (4; W.) *Cook*

177. Forbs and Browse. A study of forbs and browse including identification, region of growth, habitat, and forage value. Prerequisite: Botany 30. (2; F.) *Cook*

179. Poisonous Plants. A study of important poisonous plants, including general methods of livestock handling and range management practices, identification, region of growth, habitat, poisoning symptoms, remedies and control measures. Prerequisite: Botany 30. One lecture, one lab. (2; S.) *Cook*

180. Watershed Management. The study of floods, soil erosion and runoff on range and forest lands, the effects of vegetation in equalizing runoff and preventing erosion and methods of rehabilitating damaged watersheds. Prerequisite: Range 126. (4; F.) *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. (3; W.) *Smith*

192, 193, 194. Range Seminar. A systematic review of the field of range management and related fields. Prerequisite: Range 162. (1; F W and S) *Staff*

195. **Range Problems.** Individual study and research upon a selected range problem. (1-3; F, W, and S.) *Staff*
196. **Senior Field Problems.** Study of range management operations. (1; S.)
200. **Thesis.** Original research and study on a problem in range management. This course is open only to graduate students. (1-15; F, W, and S.) *Staff*
205. **Graduate Seminar.** Current scientific papers in range management, and an analysis of range problems in foreign countries. Not open to undergraduate students. (1; F, and W.) *Smith*
206. **Research Methods.** A study of research methods in range management and related subjects. (2; W.) *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. (2; S.) *Smith*
282. **Vegetation Influences.** Advanced study of the influences of vegetation upon the hydrological cycle, influence of vegetation on percolation of ground waters, runoff and the regimen of streams. Prerequisite: Range 180. (2; W.) *Smith*

Wildlife Management

G. H. KELKER, *Associate Professor and Head of Department*; J. B. LOW, *Associate Professor and Biologist, U. S. Fish and Wildlife Service*;
W. F. SIGLER, *Assistant Professor.*

Upon completion of the basic courses and the upper division requirements as outlined in the study program, students are granted the degree of Bachelor of Science major in Wildlife Management. The basic courses of the freshman and sophomore years are tabulated on page 204. Prospective wildlife management majors should elect Zoology 3 and 4 in the sophomore year.

Two courses are offered in wildlife management. The general wildlife management course is designed to train students for administrative and investigative work with federal and state land managing agencies and some private agencies. The emphasis of this instructional program is on the management of big game, with particular reference to western conditions. The other course, the aquatic option, is designed to provide training in the management of fish, birds, and animals of ponds, lakes, and streams, and upland birds and small game. It is designed to equip workers who wish to engage in the management of the above-named animals, either in the West or elsewhere in the United States.

Upon completion of a prescribed course and fulfillment of the requirements as listed in the Graduate School section of this catalog a Master of Science degree in Wildlife Management is given. A period of one to two years, depending upon the thesis problem and the amount of time which the student can devote to his studies, is necessary to complete all requirements for the degree. Subjects for thesis work are largely confined to problems dealing with economic status of those species closely related to the management of forests, ranges, or farmlands. Prerequisite to graduate work is a bachelor's degree in Wildlife Management or a related field.

Through the cooperation of the Fish and Wildlife Service of the U. S. Department of Interior, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the cooperatively sponsored Wildlife Research Units was established at Utah State Agricultural College in 1935.

Wildlife Research Unit funds are available for four or more graduate research fellowships for students working toward a master's degree in this field. Candidates for fellowships will be chosen from applicants who have a bachelor's degree in Biology, Forestry, or Agriculture from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before May 1.

COURSE OF STUDY

Freshman and Sophomore Years—See Basic Courses.

Forest, Range, and Wildlife Management, page 204.

A. General Wildlife Management

Junior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Principles of Wildlife Management	Wildlife	145			3		
Animal Ecology	Wildlife	160			3		
Problem Orientation	Wildlife		172			2	
General Entomology	Zoology			13			5
Mammalogy, Ornithology	Zoology		122	121		4	4
Ichthyology	Zoology		155			4	
Plant Ecology	Range			126			5
*General Range Management	Range	162			5		
*Range Forage Plants	Range		146			4	

Senior Year

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Management of Game Birds	Wildlife			154			5
*Management of Big Game	Wildlife		153			5	
Seminar	Wildlife	157	158	159	1	1	1
Field Problems	Wildlife			171			1
*Forestry Survey	Forestry	101	102		3	3	
Statistics	Mathematics	111			5		
Technical Writing	English		111			4	

B. Aquatic Wildlife Management

Students who choose the aquatic wildlife management option will substitute the following courses for those marked (*) above:

Course:	Dept.	Number			Credit		
		F	W	S	F	W	S
Limnology	Wildlife	161			3		
Aquatic and Marsh Plants	Botany	112			5		
Fisheries Management	Wildlife			165			3
Field and Laboratory Techniques	Wildlife		169			3	
Elementary Bacteriology	Bacteriology			1			4

Additional courses taken under this option must be approved by the student's major professor.

Description of Courses

99. Wildlife Practice. Lake and stream surveys and mapping for improvement purposes and for restocking; the use of census methods for big game, game birds, and rodents; cover mapping; preparation of animal skins, and study of deer and elk ranges. Summer camp. (3) *Kelker*

145. Principles of Wildlife Management. A study of the properties of animal populations, including food cycles, niches, pyramid of numbers, fluctuation, tolerance, movements, and succession. (3; F.) *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. (5; F, S.) *Kelker*

153, 253. Management of Big Game. Life histories, distribution, numerical variation, enemies, and plans for management of native big game animals. Prerequisite: Wildlife 145. A term paper required of those doing graduate work. (5; W.) *Kelker*

154, 254. **Management of Game Birds.** Life histories, distribution, environmental needs, enemies and plans for management of native and introduced game birds. Prerequisite: Wildlife 145. Additional work required of graduate students. (5; S.) *Sigler*

155. **Economic Wildlife.** General importance of the wildlife resource; natural history, economic values and control methods for rodents and predators; the course is particularly adapted for students in forestry, range, and agriculture. (3; W.) *Kelker*

157, 158, 159. **Wildlife Seminar.** Discussion of current developments in Wildlife management. One quarter is given to comprehensive testing of subject matter. (1; F. 1; W. 1; S.) *Staff*

160, 260. **Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. (3; S.) *Kelker*

161. **Limnology.** Physical, chemical and biological factors affecting occurrence and productivity of fishes and other aquatic in fresh waters. Prerequisite: Botany 30 and Zoology 13. (3; F.) *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. Prerequisite: Wildlife 154. (3; S.) *Staff*

165, 265. **Fishery Management.** Principles of lake, pond, and stream improvements; food and spawning habits of game fishes, propagation methods, and common fish diseases. Prerequisite: Zoology 155. (3; S.) *Sigler*

169. **Techniques in Wildlife Management.** The mechanics of collecting and analyzing life history material of fishes, birds, and mammals. (3; W.) *Sigler*

170. **Wildlife Problems.** Individual study and research upon a selected wildlife problem approved by the instructor. (1-3; F, W, S.) *Staff*

171. **Field Problems.** Study of wildlife management operations by various agencies of the Intermountain country. (1; S.) *Kelker*

270. **Wildlife Thesis.** Research assigned to qualified students in problems of Wildlife Management. Analysis, interpretation, and presentation of research data in a thesis. (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 of work including the following: English three units; algebra, one unit; social science, one unit; natural science (requiring laboratory work), one unit; elected (from the above groups and modern languages), three units.

The function of homemaking takes in all areas in Home Economics. For this reason courses are planned to prepare young women to carry the knowledge and skills of expert homemaking into various institutions of complex modern society. Accordingly, students may elect majors leading to a Bachelor Degree in the following divisions of Home Economics:

**CHILD DEVELOPMENT AND PARENT EDUCATION
CLOTHING, TEXTILES AND RELATED ARTS
FOODS AND NUTRITION
HOUSEHOLD ADMINISTRATION
HOME ECONOMICS EDUCATION**

The chief professional opportunities open to majors in the School of Home Economics are (1) Child Development and Parent Education: Elementary Education; Nursery Education; Education for Parenthood. (2) Foods and Nutrition: Dietetics; Research; Institutional Management; Teaching. (3) Clothing, Textiles and Related Arts; Merchandising; Management; Teaching; Costume Design; Textile Research. (4) Household Administration: Homemaking. (5) Home Economics Education: Teaching; Homemaking.

A two-year terminal course in Home Economics subjects is offered for persons who are unable to complete a four-year course but who would profit from the pursuit of practical homemaking study.

In the first two years, students of Home Economics register for courses that will satisfy college requirements for graduation.

For the convenience of students these requirements are here summarized:

Lower Division Requirements

1. Biological Science	8-12 credits
2. Physical Science	8-12 "
3. Language and Arts	8-12 "
4. Social Science	8-12 "
Total	32-48 credits

5. Six quarters of Physical Education.

6. Sophomore Composition (English 10 or 11).

All freshmen registering in the School of Home Economics and students transferring from junior colleges who do not have credit for a similar course are required to register for Home Economics Survey 10. This course deals with the orientation of the student into Home Economics and her guidance in the choice of a vocation related to this field. Open to all College women. One credit. Fall, Th. 11.

Staff

TWO-YEAR TERMINAL COURSE IN HOME ECONOMICS

A two-year terminal course in home economics is offered for students who, for any reason, do not expect to complete any of the four-year majors in the homemaking group. The course is so planned, however, that students may without undue delay, complete later the work required for a four-year course.

While the course offers a broad foundation in homemaking, it also makes possible a concentration of effort on phases of home economics that will prepare the student for employment in specific fields.

REQUIREMENTS FOR TWO-YEAR TERMINAL COURSE

1. Complete a major of 30 credits in one or more closely related departments of the School of Home Economics.
2. Complete a minor of 15 credits related to or basic to the major field—not necessarily in the School of Home Economics.

3. Twenty-four credits in basic groups:
- | | | |
|-----------------------------|---|---------|
| a. Language | 9 | credits |
| b. Exact Science | 5 | " |
| c. Biological Science | 5 | " |
| d. Social Science | 5 | " |
4. Electives—21 credits.
5. Physical Education—6 credits.

Curricula in Home Economics

CHILD DEVELOPMENT AND PARENT EDUCATION

Freshman Year

	Credit	Quarter		
		F	W	S
Home Economics				
C. T. & R. A. 9 (1)	3	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
F. & N. 9 (1)	3	F	W	S
C. D. 70	3	F	W	S
Group Requirements (2) (3) (p. 47)	20	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Other Requirements on C. D. Major p. 240				
English 24	4	F	W	S
Electives (4)	8 or 9	F	W	S
	<hr style="width: 100%;"/>			
	48 or 49			

Sophomore Year

	Credit	Quarter		
		F	W	S
Home Economics				
C. D. 60	5	F	W	S
H. Ad. 65 (1)	3	—	W	S
C. T. & R. A. 55	3	—	—	S
F. & N. 35	3	—	—	S
Sociology 60	4	F	W	S
Group Requirements (2) (3) (p. 47)	20	F	W	S
Other College Requirements (p. 47-48)				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (4)	5	F	W	S
	<hr style="width: 100%;"/>			
	51			

- (1) Suggested for the required 15 credits of General Home Economics.
- (2) Prerequisites: Art 1, 2; Music 4, 5; Psychology 3.
- (3) Group requirement recommendation: Physiology 4; Bacteriology 1; Physics 1; Sociology 10 or 70; Geology 1.
- (4) Elective recommendations: Speech 18; Child Development 176; Woodwork 74.

Junior Year

	Credit	Quarter		
		F	W	S
Other College Requirements (p. 47-48)				
English 110	4	F	W	S
Other Requirements, C. D. Major (p. 240)				
Psych. 110	3	F	—	S
Zool. 111	4	F	W	—
Certification Requirements (p. 51)				
Bact. 155	3	—	W	S
Psych. 112 (5)	3	—	W	—
Ed. 103	4	F	W	S
Ed. 104	3	F	W	S
Ed. 114	3	F	W	—
Home Economics				
C. T. & R. A. 24 (1)	3	F	W	S
Electives (4)	18	F	W	S
	<hr style="width: 100%;"/>			
	48			

		Senior Year		
	Credit	Quarter		
		F	W	S
Home Economics				
C. D. 175 A. & B.	5-7	F	W	S
C. D. 138	5	—	—	SS*
C. D. 190	1	—	—	S
Certification Requirements				
Ed. 105	3	F	W	S
Ed. 106	12	F	W	S
Education Electives	2-3	F	W	S
Electives (4)	18	F	W	S
	48			

- (1) Suggested for 15 credits of general Home Economics.
 (4) Elective Recommendations: Speech 18; Child Development 176; Woodwork 74; Sociology 160; C. T. & R. A. 33, C. T. & R. A. 115.
 (5) Recommended to fill required 45 credits for Certification.

*Alternate years given next in 1949.

CLOTHING, TEXTILES AND RELATED ARTS

		Freshman Year		
	Credit	Quarter		
		F	W	S
Home Economics				
C. T. & R. A. 9	3	F	W	S
C. T. & R. A. 24	3	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
C. D. 70 (1)	3	F	W	S
Group Requirements (2) (p. 47)	16	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Art Requirements				
Art 1	3	F	W	S
Art 2	3	F	W	S
Art 3	3	F	W	S
Electives (3)	10	F	W	S
	51			

		Sophomore Year		
	Credit	Quarter		
		F	W	S
Home Economics				
C. T. & R. A. 25	3	F	W	S
F. & N. 9 (1)	3	F	W	S
C. D. 60 (1)	5	F	W	S
Group Requirements	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Art Requirements				
Art 33	3	—	—	S
Art 114	3	F	W	S
Electives (3)	5	F	W	S
	48			

- (1) Suggested for the required 15 credits of Home Economics in addition to the major.
 (2) Group requirement recommendations: Physiology 4; Bacteriology 1, 2; Psychology 3; Economics 51; Chemistry 10, 11, 12; Sociology 60, 70; Speech 1; History 4; World Literature 40.
 (3) Elective recommendations: Clothing, Textiles and Related Art 33; Consumer Education 50; Household Administration 65; Landscape Architecture 3; Radio Speech 81; Music 80, 81; French.

Junior Year

	Credit	Quarter		
Home Economics				
C. T. & R. A. 105	3	F	—	—
C. T. & R. A. 115	3	F	W	—
C. T. & R. A. 125	3	—	W	—
C. T. & R. A. 140	3	—	W	—
C. T. & R. A. 170	3	—	W	—
Other College Requirements				
English 110	4	F	W	S
Art Requirements				
Art 123	5	F	—	S
Electives (3)	27	F	W	S
	<hr/> 51			

Senior Year

	Credit	Quarter		
Home Economics				
C. T. & R. A. 165	3	F	—	S
C. T. & R. A. 185	5	F	—	S
C. T. & R. A. 191	1	F	—	—
C. T. & R. A. 175	3	—	—	S
Electives (3)	36	F	W	S
	<hr/> 48			

- (3) Elective recommendations: C. T. & R. A. 200; H. Ad. 149, 150; F. & N. 106; Physics 1; Political Science 101, 102, 110; Journalism; Literature; Art 104C.

FOODS AND NUTRITION

Freshman Year

	Credit	Quarter		
Home Economics				
H. E. 10 (required)	1	F	—	—
C. T. & R. A. 9 (1)	3	F	W	S
C. D. & P. E. 70 (1)	3	F	W	S
H. A. 50	3	F	W	S
Group Requirements (Page 47-48) (2)	28	F	W	S
Other College Requirements				
Physical Education	3	F	W	S
Electives (3)	7	F	W	S
	<hr/> 48			

Sophomore Year

	Credit	Quarter		
Home Economics				
C. T. & R. A. 24 (1)	3	F	W	S
F. & N. 20	4	F	W	—
F. & N. 21	4	—	W	S
C. D. 60	5	F	W	S
Group Requirements				
Chemistry 10, 11, 12	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (3)	9	F	W	S
	<hr/> 48			

- (1) Recommended for the Home Economics requirement of 15 hours in the various departments within the School.
- (2) Recommended for group requirements: Physiology 4 and 5; Bacteriology and Public Health 1 and 2; Economics 5; Sociology 70; Speech 1; English 2. Note: (The first four courses listed are required of majors in Institutional Management.)
- (3) Recommended for Electives: Psychology 3; Mathematics 34 or 35; Clothing, Textiles and Related Arts 25 and/or 27; Agricultural Economics and Marketing 62; Household Administration 65; Art 1 and 2; Speech 81; Physics 1; Typewriting; Physiology 11; Vegetable Crops 1; Sociology 60.

Junior Year

	Credit	Quarter		
Home Economics		F	—	S
F. & N. 106	3	—	—	S
F. & N. 107	3	—	—	S
F. & N. 180	5	—	—	S
Chemistry		F	—	—
Biochemistry	5	—	—	—
Other College Requirements		F	W	S
English	4	—	—	—
Requirements for majors in Inst. Mgt.		F	—	S
Psychology 102a and b	5	F	—	S
Education 120	3	—	—	S
Business Administration 100	3	—	W	—
Electives (3)	15	F	W	S
	<u>48</u>			

Senior Year

	Credit	Quarter		
Home Economics		F	W	—
F. & N. 141a and b	6	—	W	—
F. & N. 145	4	F	—	—
F. & N. 146	3	F	—	—
F. & N. 190	3	F	—	S
F. & N. 191	3	F	W	S
Requirements for Majors in Inst. Mgt.		—	W	—
F. & N. 182	3	—	W	—
F. & N. 183	3	F	W	—
Electives (3)	19	F	W	S
	<u>44</u>			

(3) Elective Recommendations: Journalism 112, 113, 114; Education 121, 121b; Bacteriology and Public Health 120; Foods and Nutrition 144; Household Administration 149; Business Administration 55; Economics 28.

HOUSEHOLD ADMINISTRATION

Freshman Year

	Credit	Quarter		
Home Economics		F	—	—
H. E. 10	1	F	W	S
F. & N. 5	3	F	W	S
F. & N. 9	3	F	W	S
C. T. & R. A. 9	3	F	W	S
Group Requirements (1) (Page 47)	15	F	W	S
Physics 1	5	F	W	S
Other College Requirements (p. 47-48)		F	W	S
Physical Education	3	—	—	—
Art Requirements		F	W	S
Art 3	3	F	W	S
Electives (2)	12	F	W	S
	<u>48</u>			

Sophomore Year

	Credit	Quarter		
Home Economics		—	W	S
H. Ad. 65	3	F	W	S
C. T. & R. A. 24	4	F	W	S
C. T. & R. A. 33	5	F	W	S
C. D. 60	5	F	W	S
Group Requirements (1) (Page 47)	15	F	W	S
Econ. 51	5	F	W	S
Other College Requirements		F	W	S
Eng. 10	5	—	—	—
Physical Education	3	F	W	S
Electives (2)	5	F	W	S
	<u>48</u>			

- (1) Group requirement recommendations: Physiology 4; Psychology 3; Sociology 70; Speech 1; History 4; Political Science 1; Art 1, 2; Misc. 1, 80, 81.
- (2) Elective recommendations: Landscape Architecture 3; Sociology 60; Foods and Nutrition 35; English 24; Music 38; Journalism 15; Household Administration 50.

Junior Year

Home Economics	Credit	Quarter		
		F	W	S
F. & N. 106	3	F	—	S
H. Ad. 149	3	F	W	—
C. T. & R. A. 55	3	—	—	S*
C. D. 70	3	F	W	S
Electives (2)	36	F	W	S
	48			

Senior Year

Home Economics	Credit	Quarter		
		F	W	S
H. Ad. 150	3	F	W	S
Art Requirements				
Art 123	5	F	—	S
Other College Requirements				
Eng. 110	4	F	W	S
Electives (2)	36	F	W	S
	48			

- (2) Elective recommendations: Zoology 111; Art 114.

HOME ECONOMICS EDUCATION CURRICULA

The following professional program prepares graduates for teaching in the field of home and family living. It certifies graduates to teach any and all phases of home economics in the schools of Utah, including high schools having George-Barden (vocational homemaking).

It is important that students register with the instructor for Education 121 and 122A two quarters before they plan to do their student teaching. This provides the time necessary to obtain cooperation of schools to provide enough teaching assignments for those registering in these courses.

Freshman Year

Home Economics	Credit	Quarter		
		F	W	S
C. D. 70	3	F	W	S
C. T. and R. A. 9	3	F	W	S
H. H. Management 50	3	F	W	S
H. E. 10	1	F		
Group Requirements (1) (2) (Page 48)	31	F	W	S
Other College Requirements (Pages 47-48)				
Physical Education	3	F	W	S
Electives (3)	4			
	48			

- (1) Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 3.
- (2) Group requirement recommendations: Bacteriology 1 and 2; Econocis 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
- (3) Elective recommendations: Students are advised to consider:
- Developing a field of interest into a teaching minor i. e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.
 - Developing understanding of cultural, social, and economic problems through Art; Economics; Music; History; Political Science; Sociology.

Sophomore Year

Home Economics	Credit	Quarter		
C. D. 60	5	F	W	S
C. T. and R. A. 24	3	F	W	S
C. T. and R. A. 25	3	F	W	S
F. and N. 20	4	F	W	
F. and N. 21	4		W	S
C. T. and R. A. 33	3	F	W	S
H. Ad. 65	3		W	S
Group Requirements (1) (2)	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
	<hr/> 48			

Junior Year

Home Economics	Credit	Quarter		
C. T. and R. A. 115	3	F	W	
F. and N. 106 or	3	F		S
F. and N. 100				S
H. Ad. 149	3	F	W	
Soc. 60	4	F	W	S
Other College Requirements				
English 110	4	F	W	S
Education				
Ed. 114	3	F	W	
Ed. 120	3	F		S
Bacteriology 155	3	F	W	S
Psy. 102a	5	F		S
Electives (3)	18			
	<hr/> 48			

- (1) Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 3.
- (2) Group requirement recommendations: Bacteriology 1 and 2; Economics 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
- (3) Elective recommendations: Students are advised to consider:
- Developing a field of interest into a teaching minor, i. e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.
 - Developing understanding of cultural, social, and economic problems through Art, Economics, Music, History, Political Science, Sociology.

Senior Year

Home Economics	Credit	Quarter		
C. T. and R. A. 185	3	F		S
F. and N. 142	4	F		
H. Ad. 150	3	F		S
Electives	4			
Education				
Ed. 121	4		W	S
Ed. 122a	8		W	
Courses to complete requirements for professional education may be elected. (Check with major professor in order to be sure requirements for certification are being met.)				
Electives (3)	14			
	<hr/> 48			

- (3) Elective recommendations: Students are advised to consider:
- Developing a field of interest into a teaching minor, i. e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.

Child Development and Parent Education

HELEN L. PORTER, *Assistant Professor*; ORAL PUGMIRE, *Instructors*;
LAWRENCE S. BEE, *Professor*.

Students majoring in Child Development and Parent Education must complete 36 credit hours including the following required courses: Child Development 60, 70, 175A and B; Foods 106; Clothing, Textiles and Related Arts 55; Speech 18 or English 24; Psychology 110; Zoology 111. The remaining hours may be selected by the student from the approved courses listed below, in conference with the major advisor: Child Development 138, 190; Household Administration 50, 149 and 150; Woodwork 74; Foods 149; Sociology 60; Psychology 130 and 145.

All students graduating from any department of the School of Home Economics are required to have 15 hours of Home Economics in addition to those required in the major. These should be selected as representative subjects in Foods and Nutrition, Clothing, Textiles and Related Arts and Household Administration.

A minor in Child Development should include Child Development 60, 70, 175 A and B and Foods 106.

Students expecting to teach in nursery school, kindergarten or the elementary grades must meet the state requirements for certification. It is recommended that they adopt a composite Child Development—Elementary Education major. Such a major relieves the student of all requirements for a minor. Heads of both the Education and Child Development Departments should be consulted if this plan is followed.

9. Child Care and Training. Open to all college girls and men desiring a course in the growth, development, care and training of the young child. Designed to meet in part the increased demand for a course in Child Guidance. The subject matter content is similar to that of C. D. 60. No nursery school observation can be offered to students enrolled, due to limited laboratory facilities. Child Development majors and others required to take C. D. 60 are not permitted to use this course as a substitute. (3; F or W.) *Staff*

60. Child Development and Guidance. To acquaint teachers, homemakers, social workers, and any others interested in working with children with some of the fundamentals of child growth and development, and to help them to develop a philosophy of guidance. Each of the following hours: 9, 10, 11, 12, 1, 2, 3, should be free once during the week to allow for scheduling three laboratory hours for observation in the nursery school. Students who can free all but one of these hours should consult the instructor before registering. Open to students of sophomore standing or above. Prerequisite: C.D. 70. Fall and Winter each year, also alternate Spring quarters. (5; F, W or S.) *Porter*

60A. Child Guidance. Required of all home economics transfer students who have had only two or three credits in child study. One credit is earned by three hours of observation weekly in the nursery school. (See Child Development 60.) (2; F or W.) *Porter*

70. The Health of the Family. The anatomy and physiology of the reproductive system, preparation for motherhood, and the physical care of mother and child from the prenatal period to the end of the first year of the child's life. (3; F, W or S.)

138. Survey in Child Development. The history of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration. Open to Child Development majors only. Alternate years only to the combined group of juniors and seniors. (5; S.) *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*

175A. Nursery School Methods. This must parallel 175B. 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. (2; F, W or S.) *Porter and Pugmire*

175B. Practice Teaching in the Nursery School. An opportunity to apply the principles of child guidance in the nursery school. Open only to Child Development majors and minors. Prerequisites: C.D. 60 and 70. (5) *Staff*

176. Advanced Practice Teaching in the Nursery School. A continuation of Child Development 175; an additional opportunity to work with young children. One conference weekly with instructor. Open only to Child Development majors. Prerequisite: C. D. 175. (4-6; F, W or S.) *Staff*

190. Seminar in Child Development. Discussions and reports of research in Child Development. Open only to Child Development majors. (1; S.) *Staff*

Sociology 60. Courtship, Marriage and the Family. Designed to help unmarried students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. (4; F, W or S.) *Bee*

Clothing, Textiles, and Related Arts

EFFIE BARROWS, Professor Emeritus; BERTHA F. JOHNSON, Professor; FLORENCE GILMORE, Assistant Professor; RHEA HURST, Assistant Professor, Extension Home Furnishings Specialist; LOIS PEEL SMITH, Assistant Professor; Extension Clothing Specialist; MIGNOR PERRY, Instructor.

Students who elect Clothing, Textiles and Related Arts as their major are required to complete the following courses: Clothing 9, 24, 25, 27, 105, 115, 125, 140, 165, 170, 175, 185, 191; Art 1, 2, 3, 33, 114, 123. Clothing, Textiles and Related Arts majors may elect to minor in Art, Education, Merchandising, Business, Foods and Nutrition, Child Development, Social Science, Physical Education, English, etc.

Clothing, Textiles, and Related Arts majors to be graduated from the School of Home Economics must have 15 hours of Home Economics besides the major, which should include representative subjects in Foods and Nutrition, Child Development and Household Administration.

The following courses are required for a minor in Clothing, Textiles, and Related Arts: 9, 24, 25, and 115. Other courses may be elected to complete the minimum of 18 credits required for a minor.

A two-day field trip to be taken in the Spring quarter is required of juniors and elective for seniors majoring in Clothing, Textiles, and Related Arts. Approximate cost, \$10. 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 interior decoration.

A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing, Textiles, and Related Arts. Clothing 25 is a prerequisite. The project is turned into the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

5. Dress and Personality. Open to all college girls desiring assistance in planning and selecting campus clothes to suit personality and income. No construction. Girls who expect to major in Home Economics should take 9 instead of this course. (2; F, W or S.) *Perry*

6. Construction Problems. Open to non-Home Economics students having had clothing 5 who wishes to develop skill in construction techniques. (3; F, W or S.) *Staff*

9. Clothing for the College Girl. Designed to assist the college girl in selecting and adapting her clothes in terms of campus activities and personal expressiveness. Construction of one new garment. Open to all college girls. (3; F, W or S.) *Staff*

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. (3; W.) *Gilmore*

24. Textiles. Fibers, yarns, fabrics and finishes in relation to problems of the consumer. Prerequisite: Chemistry recommended. (3; F, W or S.) *Gilmore*

25. Clothing, Selection and Construction. Consideration is given alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, good procedures and finishes. Prerequisites: Clothing, Textiles and Related Arts 9, 24, and prerequisite or parallel Art 2. (3; F, W or S.) *Staff*

27. Household Textiles. Consideration is given fabrics for household and personal use, stressing selection, utilization, care and cost. Prerequisite: Textiles 24. Consumer Education 50 recommended. (3; S.) *Gilmore*

33. Home Furnishings. Planned to develop skill in selecting and techniques in making, remodeling, and caring for home furnishings. The laboratory includes instruction on making of draperies, curtains, lamp shades, use of sewing machine attachments, refinishing and upholstering furniture. Open to all college girls. Outside work required. (3; F, W or S.) *Gilmore*

55. Fundamentals of Family Clothing. Family clothing problems with special study and construction of children's garments from the standpoint of the aesthetic, physiological, and psychological development of children of different age levels. Prerequisite: Clothing Textiles, and Related Arts 9 and 25. (3; S.) *Johnson*

105. History of Costume. Development of costume from ancient to modern times. Shows social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. Prerequisite: History 4 recommended. Recommended for students in Home Economics, Costume Art, Physical Education, History, Speech and Dramatics. (3; F.) *Perry*

115. Costume Design. Comprehensive study of art elements and principles of design as related to dress for the individual. Application and ability to achieve beauty and art, quality in dress, in the home, and daily life are aims. Prerequisites for Home Economics Education and Clothing, Textiles, and Related Arts majors: Art 1 and 2; Clothing, Textiles and Related Arts 9, 24, and 25. Art and Clothing to satisfy the instructor for others. Outside work required. (3; F or W.) *Johnson*

125. Applied Costume Design. Creative experience in dress designing by draping on the dress form. Emphasis is placed on fitting and understanding the effect of pattern, grain, and texture on design in dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles and Related Arts 9, 25 and 115. Outside work required. (3; W.) *Johnson*

140. Decorative Textiles. Historic textiles, including printed and hand woven textiles, tapestries, damasks, oriental rugs, and laces. Laboratory work consists of weaving, needlecraft, and various means of developing decoration for garments, accessories, and household furnishings. Prerequisites: Art 1, 2, 3. Clothing, Textiles and Related Arts 105 and 115 prerequisite or parrell. (3; W.) *Perry*

165. Tailoring. Application of techniques used in tailoring suits and coats. Prerequisites: Clothing, Textiles and Related Arts 9, 24, 25, 115. Outside work required. (3; F, W or S.) *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 9, 25, 115 and 125. Outside work required. (3; S.) *Staff*

175. Textile Testing. Physical and chemical properties of textile 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 and 27. Chem. 10, 11 and 12 recommended. Outside work required. (3; S.) *Gilmore*

185. Family Clothing Problems. Family clothing problems with emphasis on economic, sociological and psychological aspects. Practical problems may in-

clude: clothing budgets, selection of children's clothing, and care and renovation of clothing. (3; F and S.) *Johnson*

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. *Johnson and Staff*

191. Readings. Reports and discussion on current literature in clothing, textiles and related arts. (2; S.) *Johnson*

200. Commercial Clothing. Experience in constructing garments for adult figures on a commercial basis with emphasis upon speed, efficiency, and fitting. Field trips to commercial custom tailoring and dress-making shop and alteration departments to study shop management. Prerequisites: Clothing, Textiles and Related Arts 125, 165 and 170. (3; W.) *Johnson*

210. Research for Master's Thesis. Credit arranged. (F, W or S.) *Johnson*

Foods and Nutrition

ETHELYN O. GREAVES, UNA VERMILLION, *Professors*; ETHELWYN WILCOX, *Associate Professor*; EDNA PAGE, PRISCILLA ROWLAND, ELNA MILLER, *Extension Nutritionist, Assistant Professors*; *Instructor.*

(For Curriculum see pages 237-238)

Students majoring in Foods and Nutrition are required to complete the following courses: Foods and Nutrition 20, 21, 106, 107, 141a and 141b, 145, 146, 180, 191; Chemistry 10, 11, 12; Biochemistry 111 and 112. Minors may be elected within any department of any other school in the College.

Those who expect to be graduate from the School of Home Economics must have 15 credits of Home Economics besides the major. These subjects should include representative courses in other departments within the school, i. e., Clothing, Textiles and Related Arts, Child Development, and Household Administration.

In addition there are definite course requirements for the specialized fields within the Foods and Nutrition Department.

Institutional Management. The majors in this field will find all the requirements for this specialized subject listed in the 4 year outline in Foods and Nutrition on pages 237 and 238.

Research: Foods and Nutrition 144.

Journalism: Journalism 12, 112.

Certification for Teaching: (see page 51).

A Master of Science degree is offered in Foods and Nutrition.

5. Principles of Nutrition. The relation of food to the health of the individual; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. (3; F, W or S.) *Rowland*

9. Meal Preparation and Serving. Principles of food selection, preparation, meal planning and serving. Open to all women students not majoring in Foods and Nutrition. (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; F or W.) *Staff*

20. Food Selection and Preparation. Food composition, scientific methods of food preparation, and food buying problems. Two lectures, two lab. periods with outside preparation. Prerequisite or parallel: Chem. 10. (4; F or W.) *Staff*

21. Food Selection and Preparation. Continuation of Foods 20 with emphasis on meat cookery. Prerequisite or parallel: Chem. 11. (4; W or S.) *Staff*

100. Quantity Food Preparation for School Lunch and Special Occasions. Designed to meet the needs of teachers of Home Economics in High School. Emphasis on planning balanced school lunches. Instruction given in the organization, preparation and service of foods for special occasions, involving large

groups. Prerequisites for vocational majors: Foods 20 and 21. Others consult instructor. (3; S.) *Vermillion*

106. Meals for the Family. Planning, preparation, and serving of meals for the family with consideration to the nutritional adequacy of meals at different levels of income. One lecture, two laboratory periods with outside preparation. Prerequisites: Foods 20 and 21, or Foods 9. (3; F, W or S.) *Staff*

107. Experimental Cookery. Development of experimental methods; their application to investigation in cookery and food preservation; acquaintance with the literature in the field; preparation of the student for independent investigations in foods. Prerequisites: Chem. 5 or 11; Foods 20 and 21. (3; S.) *Wilcox*

141a and b. Advanced Nutrition. Application of fundamentals of biochemistry to nutrition of man with practice in calculation of dietaries in health. Consideration to nutrition of the child at all ages. Prerequisites: Biochem. 111, 112 or equivalent. (3; F or W.) *Wilcox*

142. Nutrition and Dietetics. A review of fundamentals of chemistry and biology as applied to human nutrition with practice in calculation of dietaries. Required of all Home Economics Education students. Prerequisite: Organic Chem. (4; F or S.) *Greaves*

144. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations. Prerequisites: Bact. and Biochem. 111 or permission of instructor. (2; W.) *Wilcox*

145. Diet Therapy. Application of dietetic principles to problems of diet in disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. (4; W.) *Greaves*

146. Food Technology. A study of manufacture and preservation of food products and the influence of these processes on the physical, chemical, and nutritive values of foods. Prerequisites: Bact. 1 and Foods 21. (3; F.) *Greaves*

160. Special Problems. Open to qualified students majoring in Foods and Nutrition upon consultation with the instructor. Any quarter. Time and credit arranged. *Wilcox*

180. Quantity Food Preparation. Principles of cooking applied to large quantity preparation and service; standardization of foods with reference to quality and production cost; use and operation of equipment. Food and service units used as laboratories where students assist in preparation and service of foods in large quantities. Open only to senior food majors in institutional economics. Prerequisites: Foods and Nutrition 5; Foods 20 and 21. Open to Juniors majoring in Institutional management. (5; F or S.) *Vermillion*

182. Institutional Organization and Management. Principles of scientific management applied to institutions; emphasis on forms of business organization, employer-employee relations, keeping of accounts and inventories and general administrative problems. For majors planning to enter institutional economics. (3; W.) *Vermillion*

183. Food Selection and Purchase for the Institution. Consideration of sources, grading, standardization, basis of selection, methods of purchases and storage of various classes of food. A two-day trip to Ogden or Salt Lake markets and institutions. Approximate cost \$12. Prerequisites for majors: Foods and Nutrition 180 and 181. Others consult instructor. (3; W.) *Vermillion*

191. Seminar in Foods and Nutrition. Reports, discussions, and review of recent scientific literature in Nutrition. Prerequisite: Foods and Nutrition 141 or 142. (3; S.) *Greaves*

201. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral and vitamin determination. Prerequisite: Chem. 190 or 191 or equivalent. (3) *Wilcox*

202. Biological Assay of Foods. Problems in the biological assay of vitamins in foods. (3) *Wilcox*

103 or 203. Nutrition Laboratory. Micro-chemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chem. 190 or 191 or equivalent. (3) *Wilcox*

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

291. Seminar. (2) *Wilcox*

Household Administration

ETHELYN O. GREAVES, *Professor*; ORETTA M. CARLSON, *Instructor*.

For Curriculum see page ...)

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying effects of social and economic forces on the home and its management.

10. Home Economics Survey. Introduction to Home Economics. Required of all home economics majors. (1; F.) *Staff*

50. Consumer Education. Consumer's problems as they relate to food, clothing and household management. Emphasis on money management in the home. (3; F, W or S.) *Staff*

65. Housing Problems. Consideration of present housing needs and practices affecting housing construction and home ownership. (3; W or S.) *Carlson*

149. Home Management. Principles of household management and efficiency. Laboratory—selection, care and operation of modern equipment for the home. (3; F or W.) *Staff*

150. Residence in Home Management House. Required of home economics education and of household administration majors. For these students H. Ad. 149 is prerequisite. Elective for other upper division students upon consultation with the dean of Home Economics and the director of the Home Management House. Residence students are directed in practical management of home problems. (3) Time arranged. *Carlson*

Home Economics Education

HELEN L. CAWLEY, *Assistant Professor*; LELA B. GUSTAFSON, *Instructor*.

A Master of Science degree may be earned in Home Economics Education.

Education 120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; development of a method which will lead the teacher to understand better the nature of learning. Prerequisite or parallel: Psych. 102a. (3; F or S.) *Cawley or Gustafson*

Education 121. Problems in Teaching Home Economics. Study of recent investigation in Home Economics and General Education and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122a and with one other three-hour Education* course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4; W or S.) *Cawley and Gustafson*

Education 122a. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave campus the middle five or six weeks of Fall or Winter quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Ed. 121 and 122a, preferable 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. (8; W.) *Cawley*

Education 122b. 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

*It is necessary to make arrangements for specific Education course with major professor at time when plans are made for Ed. 121 and 122a.

local school. Prerequisite: Ed. 120 with Ed. 121 taken the same quarter as Ed. 122b. (4; S.) (This course does not fulfill requirements for Vocational Homemaking Certificate.) *Cawley and Gustafson*

Field Trip. For senior girls and graduate students enrolled in homemaking education. Planned cooperatively by students and Homemaking Education staff. Trip will probably take place during Spring Quarter, and estimated cost to participants will be given in advance.

Home Economics 199. Special Problems in Home Economics Education. Developed around individual needs of students not otherwise provided for in curriculum. (1-2; F, W or S.) *Cawley and Gustafson*

Home Economics 120. Research for Masters Thesis. Credit arranged. *Cawley*

Seminar. Home Economics Education 237. Gives opportunity for investigation and reporting on individual problems. *Cawley*

Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools

Follow the Home Economics Education Curricula. For transfer students, credits are evaluated by staff members and equivalent course work is accepted. Requirements for certification follow:

Group I Nine credits in courses which will assist in the understanding of young people of school age.

	Credit
*Psychology 102a	5
*Bacteriology 155	3
Psychology 102b	2
Education 113	3
Child Development 60	5

Group II Six credits in understanding the school.

*Education 114	3
Education 111 or 112	3
(Educ. 112 is usually blocked with Educ. 121.)	
Education 116	3

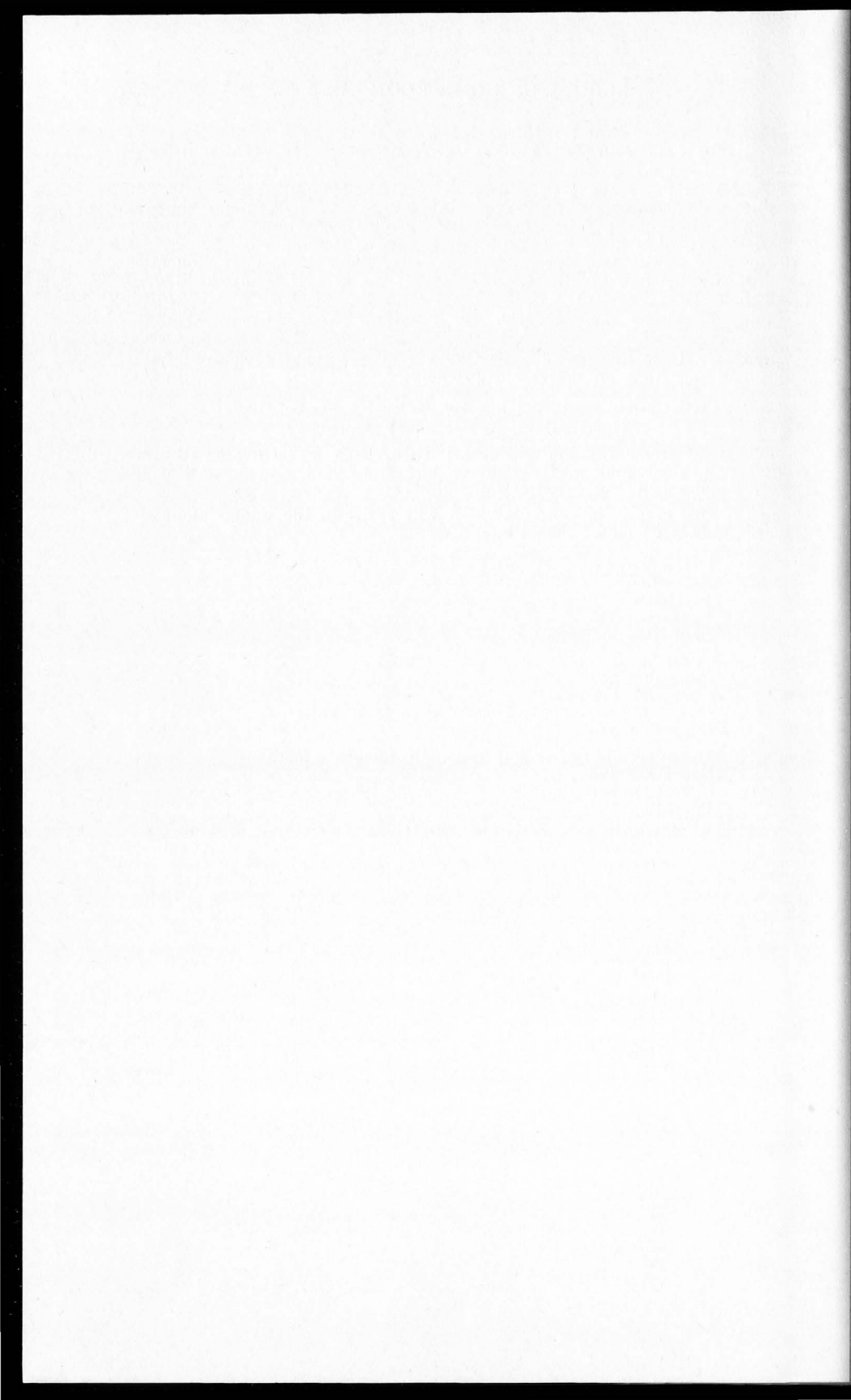
Group III Fifteen credits in Student Teaching, including methods.

*Education 120	3
*Education 121	4
*Education 122a	8

A total of thirty-three credits in professional education, including Bacteriology 155, must be presented to meet the requirements. The special courses recommended for certification in Vocational Homemaking Education are listed above. These professional courses plus the prescribed subject matter courses in Home Economics are necessary for certification in Vocational Homemaking Education in Secondary Schools.

Types of service available to teachers:

1. Special guidance and help are given teachers who wish to return to school to meet the requirements for renewing certificates.
2. Opportunity to meet certification requirements is offered teachers or other persons.
3. Advanced study leading to Master of Science in Home Economics Education is offered.



DEPARTMENT OF MILITARY SCIENCE AND TACTICS

Ground and Air

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T.*

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General Information

COLONEL E. W. TIMBERLAKE, *CAC, Commandant, PMS and T*; LT. COL. JAMES C. BRADFORD, *QMC*; LT. COL. HAROLD E. COTTER, *AC*; MAJOR ALFRED B. BANKS, *FA*; MAJOR HAROLD D. HIGGINS, *CAC*; MAJOR JOSEPH R. MEACHAM, *CAC*; MAJOR FLOYD E. ROTH, *AC*; CAPTAIN RALPH L. GIDDINGS, JR., *FA*; CAPTAIN JOSEPH W. LYONS, *QMC*; CAPTAIN ALLEN G. McCLURE, *AC*; CAPTAIN WILBUR J. SCHINDLER, *AC, Assistant Professors*; M/SGT. FRANCIS ALIX, *DEML*; M/SGT. CHARLES D. HENDRICKS, *DEML*; M/SGT. JOHN L. HOLLAND, *DEML*; M/SGT. FREDERICK V. MCWOLD, *DEML*; 1ST. SGT. MARVIN L. BRIMMER, *DEML*; 1ST. SGT. WALTER B. SPEED, *DEML*; T/SGT. JOSEPH C. HUGHES, *DEML*; T/SGT. VAL M. JOHNER, *DEML*; T/SGT. CHARLES J. LEPLEY, *DEML*; T/SGT. I'LONE L. NORMAN, *DEML*; T/SGT. PAUL H. WESSMAN, *DEML*; S/SGT. JACK E. HOWARD, *DEML, Instructors*; PROFESSOR N. W. CHRISTIANSEN, *Band*.

UTAH State Agricultural College, having accepted the provisions of the Act Congress approved July 2, 1862, is classified as a Land-Grant College and is therefore obliged to offer a course in Military Science and Tactics as a part of the College curricula. The obligations to provide military instruction on Land-Grant institutions by the Act of July 2, 1862, are not altered by the National Defense Act of 1920 as amended.

Recognizing that preparation for national defense is an important duty of citizenship, and that qualities of patriotism, loyalty, discipline, leadership, and respect for constituted authority inculcated by proper military training are valuable in the formation of character, it has been the consistent policy of the College to cooperate with the Federal Government in making the Department of Military Science and Tactics as effective as practicable.

At the request of the College authorities a senior unit of the Reserve Officers' Training Corps was authorized at this Institution by the President of the United States under the provisions of Section 33 of the Army reorganization Act of June 4, 1920. Accordingly, the Board of Trustees has agreed to maintain a two-year basic course in Military Science and Tactics as a required subject for all qualified male students.

The primary object of establishing units of the Reserved Officers' Training Corps is to qualify students for appointment in the Officers' Reserve Corps of the United States Army, and also for commissions in the Regular Army as "Distinguished Military Graduates." This training will also be as valuable to the student in his industrial or professional career as it would be should the nation call upon him to act as a leader in its defensive forces.

Enrollment in the Reserve Officers' Training Corps is not in any sense "conscription," nor does it convey liability to service in any component or branch of the United States Army. As its name implies, the R. O. T. C. is an instrument of training and instruction only.

Military Science Regulations

The student, by registration at the Institution, obligates himself to conform to such requirements as are or may be prescribed by the College under regulations of the Reserve Officers' Training Corps. These requirements follow: Two years of military training (six credits) are required of all qualified male students. By regulations of the College, the basic course is normally required during the first and second years at the Institution.

To receive instruction at the College or to graduate from the College, the student must attend military classes and do satisfactory work in them. It is the duty of every student of whom military training is required, to see that he is properly registered for the course and to report for instruction. Students who are required to take military training but fail to register or to report for classes will, with the approval of the President, be excluded from all classes in the College. The responsibility of complying with the regulations regarding Military Science rests entirely with the student.

The 11 a. m. hour on Thursdays is reserved exclusively for Military Drills. No other classes will be allowed to conflict with this hour.

A student claiming exemption from Military Science must present a petition for such excuse at the time of registration. Pending the action of the petition, the student will register for the course prescribed and will enter upon the work of such course.

Any student who may be excused from attendance in Military Science for any valid reason must make up the deficiency in other departments of study.

Every student registered for Military Science is required to make a uniform deposit of \$5.00. A laboratory fee of \$2 is deducted from this deposit. The balance, less the cost of any property lost or damaged, is refunded upon the completion of the year or upon withdrawal from the course.

Reserve Officers' Training Corps

The four years' course in the Reserve Officers' Training Corps is divided into the Basic Course and the Advanced Course.

The Basic Course consists of the first two years in Military Science and normally corresponds to the freshman and sophomore years. When entered upon by any student it shall be a prerequisite for his graduation unless he is relieved from this obligation by proper authority. Students transferring from institutions not having R.O.T.C. Units must enroll.

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

Student electing Military Science as a major subject should do so at the beginning of the freshman year in order that sufficient time may be available to complete the Advanced Course. The School of Arts and Sciences offer a major* in Military Science.

Uniforms and Equipment

An officer type uniform and overcoat of standard army pattern is furnished by the War Department to each student taking military training. Shoes are not furnished. Each student should provide himself with a pair of brown shoes before entering the College, as they will be required immediately upon his admission.

The uniform and equipment issued for the use of a student, remains the property of the United States. At the end of each year, or at such other times as students may terminate their military training, all clothing and other supplies will be returned in a serviceable condition, not later than one week following the termination of such training. Articles which have been lost, damaged, or destroyed are charged against the student concerned.

Any student not returning the previously mentioned uniforms and equipment or not paying for articles lost shall have suspended all college credit earned at this institution until the debt to the college is liquidated.

BASIC COURSE

Students in the Basic Course are required to pursue their courses diligently until satisfactorily completed, and to meet such requirements for care of equipment as may be prescribed. In case of failure in any quarter, the student is required to repeat the work.

General conditions for enrollment in the ROTC. All students formally enrolled in the Basic and Advanced Course of the Senior Division ROTC must be—

1. Citizens of the United States.
2. Physically qualified, under standards prescribed by the War Department (see AR 40-105 and 40-110). Due allowance will be made for those defects which are correctible before the student, who is otherwise qualified, becomes eligible for appointment as a commissioned officer.
3. Accepted by the institution as a regularly enrolled student.

*A Department Major in the School of Arts and Sciences is offered in Military Science and Tactics. Prescribed requirements are: M.S. and T. 36 credits. Mathematics 34, 35, 46, 97, min. 18 credits; French, German, Portuguese or Spanish, two years; Surveying 81, 82 and 83, 8 credits; Chemistry 3, 4 and 5 or 10, 11 and 12, 15 credits; Physics 20, 21 and 22, 15 credits; Political Science 10 and 102, 8 credits. History 17 and 21, 10 credits.

In addition to the general conditions for enrollment in the ROTC enumerated above all students formally enrolled in the Basic Course must comply with the specific conditions listed below:

1. Be not less than 14 years of age and must not have reached 23 years of age at the time of *initial* enrollment in the *Basic Course*.
2. Successfully complete such general survey of screening tests as may be prescribed.

ADVANCED COURSE

In addition to the general conditions for enrollment in the ROTC enumerated in the Basic Course above, all students formally enrolled in the Advanced Course ROTC must comply with these conditions:

1. Not have reached 27 years of age at the time of initial enrollment in the Advanced Course. Formally enrolled members of the Advanced Course are exempt from registration, induction, training, or service under section 5a of the Selective Training and Service Act of 1940 as amended.
2. Successfully complete such survey and general screening tests as prescribed.
3. Be selected by the PMS and T and the head of the institution.
4. Execute a written agreement with the Government.
5. Have completed the Basic Course or equivalent thereof.
6. Be enrolled in an academic field prescribed by the chief of a technical service if admission to the Advanced Course in a unit of a technical service is desired.

Credit for Previous High School, Junior Division, ROTC Training

7. One quarter's credit is allowed for each year's work completed in the Junior Division ROTC. This does not obriate the college requirements of six quarters of Military Science or Physical Education, so it may be used in lieu of three quarters thereof.

Credit for active military or naval service in lieu of the Elementary Course, R.O.T.C. Veterans who have been honorably discharged, or transferred to the Enlisted Reserve Corps and relieved from active duty, are given credit under the provisions of Public Law 81—79th Congress, in lieu of completion of all or part of the basic course, R.O.T.C., on the following basis:

- a. For not less than six months' active service in the Army, Navy, Marine Corps, or Coast Guard, credit in lieu of first year Basic Course.
- b. For not less than one year of such active service, credit in lieu of the entire Basic Course.

Contracts. Separate contracts are executed between the Government and students enrolled in the Advanced Course. Such a contract requires a student to complete the Advanced Course of training and to attend the Advanced Camp at the time specified unless he is soon discharged for the convience of the Government. The contract does not specify that the Advanced Course must be pursued without interruption. However, the contract is canceled if the Advanced Course is interrupted for two calendar years. During their period of participation in the Advanced Course, duly enrolled students are paid monthly a monetary allowance in lieu of subsistence at a daily rate equal to the value of the commuted ration. Upon obtaining the necessary legislation, such students are paid an additional allowance in lieu of quarters and uniform at the rate of \$1.00 per day.

Summer Camp. Students attending ROTC summer camp are messed and quartered, and are paid at the rate prescribed for soldiers of the 7th grade. The War Department will seek legislation authorizing the payment to students attending the ROTC summer camp at the rate prescribed for soldiers of the 6th

grade. A travel allowance from the institution to camp and return to the institution at the rate of 5 cents a mile is authorized students eligible to attend the advanced summer ROTC camp.

R. O. T. C. Band

A military band is an element of the Reserve Officers' Training Corps, under the direction of the Band Instructor, and is governed by the rules of the Department of Military Science and Tactics. Uniforms and instruments are furnished by the War Department.

Members of the band will be selected from among those students who are registered in Military Science and who have demonstrated their ability for such selection. Tryouts for the band will be conducted under the supervision of the Band Instructor and will be held preferably during the first two weeks of each quarter. Members of the band receiving credit in Military Science will be limited to not more than sixty students.

Students selected for the band are required to take all theoretical work in Military Science and sufficient practical drill to insure making a creditable appearance in ranks. They play with the band only at regular drill formations.

Basic

Students satisfactorily completing the Basic Course receive one credit per quarter, which may be included in the 186 credits required for graduation.

Students satisfactorily completing the Advanced Course receive three credits per quarter, which count toward the 186 credits required for graduation. In addition, students enrolled in the Advanced Course will receive six credits for satisfactory completion of the six weeks' course at the Advanced Camp, conducted annually and normally attended after completion of the first year of Advanced Course. If the length of the summer camp is increased the credits allowed for summer camp will be increased accordingly, on the basis of one credit for each additional week, up to a total of nine weeks.

For students desiring a major in Military Science, at least 6 credits of Military Science Seminar are required. Other members of the Advanced Course may take seminar with the approval of the PMS&T. Research work to be done in military history, tactics, strategy, logistics, development of weapons, evolution of warfare, and related fields. Practical work to be done in motors, supply, administration, etc. with the members of the staff.

Students majoring in the Schools of Arts and Sciences, and Engineering may submit Advanced Military Science as a minor for graduation.

Members of the band who successfully complete the work in the various quarters receive credits as follows: First and second years, one credit per quarter in Military Science.

Courses of Instruction

Classes in Military Science will not be held at times other than as scheduled, but any student desiring extra instruction may make the necessary arrangements with the Professor of Military Science and Tactics.

BASIC COURSES

- | | |
|---|--------------|
| 1, 2, 3. Military Science. First year. (1; F. 1; W. 1; S.) | <i>Staff</i> |
| 4, 5, 6. Military Science. Second year. (1; F. 1; W. 1; S.) | <i>Staff</i> |

These courses follow the Program of Instruction for First and Second Year Basic Course ROTC, laid down in War Department Memorandum 145-46, dated 19 June 1946. They cover the following subjects:

- Military Organization
- Hygiene and First Aid
- Leadership Drill and Exercise of Command
- Physical Development Methods

Individual Weapons and Marksmanship
 Maps and Aerial Photographs
 National Defense Act and ROTC
 Military Administration
 Evolution of Warfare
 Military Law and Boards

These new courses contain the latest developments and trends in tactics and technique and the latest materiel is available to supplement the instruction.

R.O.T.C. BAND COURSES

1B, 2B, 3B. R.O.T.C. Band. First year. (1; F. 1; W. 1; S.) *Christiansen*
 4B, 5B, 6B. R.O.T.C. Band. Second year. (1; F. 1; W. 1; S.) *Christiansen*

ADVANCED COURSES

101, 102, 103. **Military Science, Artillery.** The newly instituted Post-War ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for first year advanced (Artillery) ROTC students. In staff and administrative subjects emphasis is on psychology of leadership and military problems of the United States. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of artillery units of all echelons. The latest material and training aids available are used to supplement instruction. The ultimate goal of the course is a commission as a Second Lieutenant in the Officers Reserve Corps, or a commission in Regular Army for "Distinguished Military Graduates." (3; F. 3; W. 3; S.) *Staff*

104, 105, 106. **Military Science, Artillery.** The newly instituted Post-War ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Artillery) ROTC students. In staff and administrative subjects time is devoted to study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of artillery units of all echelons. The latest materiel and training aids available are used to supplement the instruction. Completion of this course satisfies military academic requirement for a commission as Second Lieutenant in Officers Reserve Corps or a commission in Regular Army for "Distinguished Military Graduates." (3; F. 3; W. 3; S.) *Staff*

111, 112, 113. **Military Science, Quartermaster.** The newly instituted post-war ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for first year advanced (Quartermaster Corps) ROTC students. In staff and administrative subjects emphasis is on psychology of leadership and military problems of the United States. The branch material subjects are concerned with latest developments and trends in Tactics and Technique of Quartermaster Corps units of all echelons. The latest materiel and training aids available are used to supplement instruction. The ultimate goal of the course is a commission as Second Lieutenant in Officers Reserve Corps or commission in Regular Army for "Distinguished Military Graduates." (3; F. 3; W. 3; S.) *Staff*

114, 115, 116. **Military Science, Quartermaster.** The newly instituted post-war ROTC program of instruction. Training is provided in branch material and staff and administrative subjects for second year advanced (Quartermaster Corps) ROTC students. In staff and administrative subjects time is devoted to study of psychological warfare, command and staff duties, geographical foundation of national power and military teaching methods. The branch material subjects are concerned with the latest developments and trends in Tactics and Technique of Quartermaster Corps units of all echelons. The latest materiel and training aids available are used to supplement instruction. The completion of this course satisfies military academic requirement for a commission as Second Lieutenant in Officers Reserve Corps or a commission in Regular Army for "Distinguished Military Graduates." (3; F. 3; W. 3; S.) *Staff*

121, 122, 123. **Military Science, Air.** Composed of the subjects offered for the first time during 1946-47. They are in line with the newly instituted post-war ROTC program of instruction. Training is provided in branch material and in staff and administrative subjects for first year advanced (Air Corps) students. In branch material subjects, students become familiar with duties of Air Corps in general and gain a background from which they will be basically qualified to perform duties as they are assigned to the usual offices. These subjects are concerned with the latest developments and trends in Tactics and Techniques of Air Corps units of all echelons. The latest materiel and training aids available, including new text books, are used to supplement the instruction. (3; F. 3; W. 3; S.)

Staff

124A, 125A, 126A. **Administration.**

124, 125, 126. **Armament, Military Science, Air.** Offered for first time during 1947-48. The student is given one specific subject, under the branch material subjects, which will qualify him for a particular job in relation to the Air Force. The choice of courses will be as follows: Armament; Personnel Administration. It is contemplated that the additional course of Communication will be added for the year 1948-49. The latest materiel and training aids available are used to supplement the military academic requirement for a commission as a Second Lieutenant in the Officers Reserve Corps which is the final goal of the ROTC training or a Regular Air Force commission for "Distinguished Military Graduates." The staff and administrative subjects will include such studies as those of Psychological Warfare, Command and Staff Duties, Geographical Foundation of National Power and Military Teaching Methods. (3; F. 3; W. 3; S.)

Staff

These courses are designed to produce future officers of the Air Corps who are thoroughly skilled in the duties they are to perform so they may accomplish their assignment as efficiently and economically as possible. In addition to this training each student will be given approximately ten hours of flying time as an orientation course so that he may better understand the place of importance that his particular job occupies. If a student so desires he may indicate his desire to become a pilot and after receiving his commission as Second Lieutenant he will be sent to the regular pilot training school which will take approximately one year. Any such student will have a priority for training next to that of graduate of the U. S. Military Academy. This additional training will not be required of any student and can be obtained only by individual application. Completion of this course satisfies the military requirements for a commission as Second Lieutenant in the Officers Reserve Corps or a Regular Army Commission as a "Distinguished Military Graduate."

SPONSOR DRILL COURSES

51, 52, 53. **Military Science, Sponsor Drill.** Freshman year. A drill course for girls elected to Corps of Sponsors. (1; F. 1; W. 1; S.)

Staff

54, 55, 56. **Military Science, Sponsor Drill.** Sophomore year. (1; F. 1; W. 1; S.)

Staff

57, 58, 59. **Military Science, Sponsor Drill.** Junior Year. (1; F. 1; W. 1; S.)

Staff

60, 61, 62. **Military Science, Sponsor Drill.** Senior Year. (1; F. 1; W. 1; S.)

Staff

GIRLS' RIFLE COURSES

71. **Military Science, Girls' Rifle Course.** A basic course in marksmanship. (F, W or S.)

Staff

72. **Military Science, Girls' Rifle Course.** An advanced course in marksmanship. (F, W or S.)

Staff

ADVANCED CAMP

110. **Military Science, Artillery.**

120. **Military Science, Quartermaster.**

130. **Military Science, Air.**

The advanced camp consists of practical and theoretical military instruction of a specialized type and is of six weeks' duration. The War Department will seek legislation to extend the period of the advanced camp to eight weeks. Students normally attend the advanced camp between the two academic years of the advanced course. Credits for advanced summer camp are on the basis of one credit for each week of attendance.

151, 152, 153. Military Science Seminar. Prerequisite: First year advanced ROTC course (Artillery, Quartermaster, or Air Force) and approval of PMS&T. May be taken concurrently with first year advanced course. Credits arranged. *Staff*

154, 155, 156. Advanced Military Science Seminar. Prerequisite: Military 151, 152, or 153, second year advanced ROTC (Artillery, Quartermaster, or Air Forces) and approval of PMS&T. May be taken concurrently with second year advanced course. Credits arranged. *Staff*

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AGRICULTURAL EXPERIMENT STATION

R. H. WALKER, *Director*.

THE Agricultural Experiment Station, established in 1889, is a major division of the College. It is responsible for conducting research in Utah under provisions of the Hatch, Adams, Purnell, Bankhead-Jones and Agricultural Research and Marketing Acts of Congress, and of various acts of the Utah State Legislature. Its primary objective is to conduct experiments and scientific researches that have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and the development and improvement of the rural home and rural life. The research results are prepared for dissemination in the form of bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The Agricultural Experiment Station staff numbers approximately 100, many of whom are also members of the teaching faculty of the College; some of them also divide their time with the Agricultural Extension Service of the College. In addition, several employees of various bureaus of the U. S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

The main offices of the Agricultural Experiment Station, including the office of the Director, and the Division of Publications, are on the College campus, on the first floor, south wing of the Main Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed as necessary among the various College buildings.

Greenhouses are maintained for investigations in horticulture, vegetable crops, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the Branch Agricultural College, at the U. S. Forest Service Desert Range Station, and on the ranges in different parts of the state.

The Station also maintains a number of experimental farms:

At the **Dairy Experimental Farm**, composed of about 100 acres of land, barns and a house, the Station, maintains an experimental Holstein dairy herd of about 60 pure-bred animals. Pasture investigations are also conducted here.

The **Greenville Farm**, a 45-acre tract, is used for experimental work in plant breeding and other phases of crop production.

The **Farmington Substation** at North Farmington is a 50-acre tract used for experimental work in horticulture and vegetable crops.

At the **Nephi Farm** experimental work in dry farming and range seeding is conducted. This farm is composed of 103 acres.

The **Forage Experimental Farm**, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering for study of the improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

The **Ogden Substation** located in Weber County north of Ogden is a 71 acre tract used for investigations in fruit production.

The **Poultry Experimental Farm**, a new farm of about twenty acres, is used for research on the breeding, feeding, and control of disease in chickens.

The **Turkey Experimental Farm** is a new 35 acre farm east of the Campus used for turkey breeding, nutrition, and disease control studies.

The Station also owns farm plots near the College and in Washington County, and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these may be mentioned the soil survey work; plant disease surveys, problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of the social problems connected with rural living; the gathering of snow survey data, problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.

Major lines of research now in progress include projects in the departments of Agricultural Economics, Agronomy, Animal Husbandry, including 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, and Zoology, Entomology and Physiology.

ENGINEERING EXPERIMENT STATION

J. E. CHRISTIANSEN, *Director*.

BY act of the Board of Trustees of the Utah State Agricultural College, December 2, 1918, the Utah State Engineering Experiment Station was established to serve the State in a manner broadly outlined as follows:

(1) To serve those industries and utilities affecting the agricultural and rural populations of the State and to aid public officials and teachers by making engineering investigations of significance and interest to them.

(2) To further the development of methods of processing and use of waste products from agriculture.

(3) To develop methods of processing and making available for use the undeveloped agricultural and industrial raw materials of the State.

(4) To further develop the science of Irrigation and Drainage to the end that the land and water resources of the State may be most fully utilized.

(5) To stimulate a greater use of native materials in rural housing and farm structures.

(6) To develop applications and uses of power equipment and to help solve problems relating to the water supply and sanitation of the farm home.

(7) To develop new tillage, harvesting, and weed control equipment.

(8) To develop new methods and uses of native materials in the construction of farm-to-market roads and highways.

(9) To cooperate with the Federal government in the conducting of investigations along these and other lines of engineering in harmony with the functioning of the Land-Grant College.

(10) To stimulate and elevate engineering education by developing the research spirit in faculty and students.

(11) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations and researches as will be of greatest benefit and interest to the people of Utah.

The Engineering Experiment Station is an integral part of the School of Engineering and Technology, and the laboratory facilities and shops of the School of Engineering are available for the investigational work of the Station to extent of sums allocated for their operation and support.

The Dean of Engineering is Director of the Station, and the staff consists of members of the teaching staff, School of Engineering and Technology.

EXTENSION SERVICE

CARL FRISCHKNECHG, *Director*.

Farm income cannot all be measured in terms of cash; part of it consists of fresh food, comfortable homes, and pleasant surroundings. The stability of ownership and close contact with nature develop virtues in farm families to make their members the highest type of citizens.

The main objective of the Extension Service is to aid rural people in developing useful and satisfactory lives. Its methods of work is to help people to

help themselves, rather than doing things for them. It gets the people's view point of their problems and needs through program planning meetings. Rural leadership is developed by encouraging groups of people to analyze their own problems. A plan to solve these problems becomes the Extension program of work.

Programs so developed in the past—many of which will be chosen for continuation—include: Increased production per acre and animal unit, more efficient marketing, conservation of the soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work to give boys and girls more appreciation for the farm and home, better understanding of national and world affairs.

The Extension Service is a part of the College, and a part of the National Extension Service. It has agricultural and home demonstration agents in practically every county. Cooperating with the agents is a state staff of specialists in agricultural economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, 4-H Club work, clothing, dairying, dairy manufacturing, entomology, home furnishings, home management, horticulture, irrigation, marketing, nutrition, poultry, rural sociology, and soil conservation.

To help train rural leaders, the Extension Service conducts free, non-credit short courses in various agricultural and home economic subjects. These courses are given at the College.

EXTENSION CLASSES, HOME STUDY, BUREAU OF VISUAL AIDS IN EDUCATION

L. G. NOBLE, *Director.*

UTAH State Agricultural College through the Extension Class Program, Home Study Courses and Visual Aids in Education is prepared to give assistance to individuals and community groups interested in educational and cultural programs.

EXTENSION CLASSES. Extension Classes are offered in practically all subjects. In-service helps to teachers are available in every department including classes for the renewal of teaching certificates. Classes will also be provided in vocational fields and for special-study groups.

HOME STUDY. Utah State Agricultural College was one of the first educational institutions of the Intermountain Region to establish a Home Study Department. Correspondence Study furnishes an excellent opportunity for systematic instruction to students of High School or College grade and to all adults who desire to obtain information in selected fields.

Students must be at least nineteen years of age, or must submit fifteen units of high school work, or must be graduates of a high school for admission to Correspondence study courses of college grade. One-fifth of the credits (37) necessary for a degree may be earned through this department.

In the College division a wide variety of subjects is offered in the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, including Poultry and Dairying, Art, Bacteriology, Business Administration and Accounting, Economics, Education, English, Entomology, Forestry, 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 GOVERNING EXTENSION WORK

I. GENERAL

All instructors in extension courses are either members of the regular teaching faculty officially assigned to the teaching project concerned, or non-resident members appointed under the procedure customary for faculty appointment in the Institution.

Extension credit courses given by direct class instruction shall:

- (a) be equivalent in content, hours of class instruction and preparation, to similar courses offered in residence work,
- (b) be subject to the same prerequisites as comparable campus courses, or as the departments may prescribe, including a comprehensive final examination.

II. RESIDENCE COURSES SUPERVISED BY EXTENSION DIVISION

Residence credit shall not be given for off-campus work without special approval of the Deans Council.

Courses carrying extension credit should not exceed 120 minute periods.

Extension classes for graduate students will not be given without special permission of the Graduate School.

III. HOME STUDY COURSES

All home study courses must include a final examination.

Students registered for home study must count this study as part of their total load in case of registration for residence work at the College. If the home study of the residence registration exceeds the maximum amount permitted by the Institution, then the student must obtain the permission of the Attendance and Scholarship Committee to carry this excess load.

Each school of the College, subject to faculty approval, shall determine the nature and the amount of home study credit accepted for admission and toward graduation. In no case shall more than 25 percent of the total number of credit hours accepted for graduation be home study credit.

(For other regulations concerning Extension credits, see section on "Graduation" in introduction of this catalog.)

VISUAL AIDS IN EDUCATION. The service of the Bureau of Visual Education is being made available to all schools, clubs and community groups. At present the Bureau is especially prepared to give service in the fields of Agriculture, Home-making and Recreational Activities. New films on timely topics and subjects are being added to the Library constantly. Individuals and school and community groups are invited to contact the Bureau with their visual education problems.

Catalog information and instructions on how to obtain department films from the various depositories in the United States is available in this office.

SUMMER SCHOOL

M. R. MERRILL, *Dean.*

FOR more than 30 years the College has conducted Summer School as an important part of its educational program. Since 1924, the offering has been materially enlarged and enriched and a very stimulating lecture course established. The purpose of this large educational undertaking is to bring to Logan, with its delightful summer climate and many recreational features, a number of the leading educators of the nation, and build, in the Intermountain West, a Summer School of wide influence.

During the Summer School nearly all departments of the College offer courses, the program being arranged to meet the particular needs of summer students. The courses offered in Education, Psychology, and related departments make it possible for the students to meet all of the requirements for Utah certification for High Schools, Junior High Schools, and Elementary Schools. The curriculum will also meet practically all of the requirements for certification in surrounding states.

In the past years the majority of summer students have been teachers in secondary and elementary schools. At present an increasing number of regular students are continuing on through the summer. High school graduates are also entering the college immediately rather than postponing entrance to the Fall Quarter. Returning service men and women are particularly interested in a regular summer program inasmuch as nearly all of them wish to complete

their education as quickly as possible. The summer curriculum is being arranged to meet this trend. Consequently, practically all of the departments are offering much of their regular program during the Summer Quarter.

Graduate Credit

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to secure this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved at the time of registration.

RELATED INSTRUCTION

C. D. McBRIDE, *Supervisor*; A. L. BEECHER, *Assistant*.

THE Division of Technology, in cooperation with other departments, offers Related Instruction for Veterans and other employer persons. The purpose is to increase the vocational knowledge and civic intelligence of occupational workers. The courses are classified as under three main headings: namely, Commercial, General and Industrial, and are described in a separate Related Instruction Catalog. While the numbers and titles of the courses as listed in the Related Instruction Catalog are similar to many courses in the regular College catalog, yet the content is designed to apply particularly to employed personnel. Terminal credit is given. College credit may be obtained by anyone with college standing who satisfactorily completes a Related Instruction course, applies for, and successfully passes the special examinations for the corresponding college course.

The classes are held in the evening and are set up on a clock hour basis. Courses generally run for a period of twelve weeks. Any of the courses listed will be given if ten or more students enroll.

(1) **Commercial Group:** Advertising, Accounting, Business Administration, Business Math, Merchandising, Office Management, Personnel Management, Purchasing, Salesmanship, Secretarial Science, Shorthand, Typewriting.

(2) **General Group:** American Government, Applied Science, Business Law, Commercial Art, Design, Economics, Business and Trade English, Menu Planning, Personal and Public Health, Safety and First Aid, Speech, Vocational Adaptation.

(3) **Industrial Group:** Art Metalry, Automotive Chassis and Steering Correction, Automotive Electricity, Automotive Power Plants, Body and Fender Repair, Building Construction, Cabinet Making, Diesel Engines, Drafting and Blueprint Reading, Electrical Code, Elements of Plumbing, Employee-Employer Relations, Forging, House Wiring, Industrial Electricity, Joinery and Millwork, Machine Shop Practice, Trade Mathematics, Meat Cutting Theory, Metal Refinishing, Motor Tune Up, Painting, Photography, Practical Electricity, Radio, Refrigeration, Textile Chemistry, Upholstering, Welding, Wood Finishing.

RELATED TRADE EXTENSION

The Division of Technology, in cooperation with the U. S. Office of Education and the Utah State Department of Vocational Education, offers a program of Related Trade Extension for journeymen and other skilled workers. This program is separate and distinct from the program of Related Instruction for Veterans. Its offering is limited to short, intensive courses in special problems to meet the specific needs of advanced workers in the industry. For additional information, see the Related Trade Extension Catalog.

BRANCH AGRICULTURAL COLLEGE

H. WAYNE DRIGGS, *Director.*

THE Branch Agricultural College of Utah marks the date 1897 as the year of its founding. Its first service to the state was listed under the title of the Branch Normal School, of the University of Utah. With the growing need in Southern Utah for agricultural development a change of administration at the parent institution was effected in 1913 and the school then became a branch of Utah State Agricultural College. Occasion for additional training for the youth of Southern Utah thus opened. Through new college offerings in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all Branch Agricultural College courses parallel those of the lower division of the parent institution.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Senior Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

The Extension Service and the Agricultural Experiment Station are closely connected with the B. A. C., and certain members of the resident staff at Cedar City are also members of the staff of these two divisions. The deans of the parent institution supervise closely the work of the corresponding divisions here.

SUMMARY OF ATTENDANCE

School Year 1947 - 48
to Date of May 18, 1948

RANK	AGRICULTURE		FOR- ESTRY	ARTS & SCIENCES		COMMERCE		EDUCATION		ENGINEERING		HOME ECONOMICS		TOTAL
	MEN	WOMEN	MEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	MEN	WOMEN	
Graduates	56		16	45	7	17	6	42	20	21			6	236
Seniors	80		35	57	43	68	29	49	60	66			51	538
Juniors	111	1	80	87	46	104	24	61	58	152			67	791
Sophomore	217	1	143	185	69	180	49	117	76	327	2		92	1458
Freshman	343	2	156	260	128	181	94	151	79	305		1	115	1815
Total Collegiate	807	4	430	634	293	550	202	420	293	871	2	1	331	4838
Vocational	2				2			1	6	3			1	15
Totals	809	4	430	634	295	550	202	421	299	874	2	1	332	4853

Male 3719 — Female 1134 — Total 4853

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