1957

General Catalog 1957

Utah State University

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Resident Colleges

College of Agriculture
College of Business and Social Sciences
College of Education
College of Engineering and Technology
College of Forest, Range and Wildlife Management
College of Home and Family Living
University College
School of Graduate Studies

Branch Colleges

College of Southern Utah, Cedar City
Snow College, Ephraim
An Old Institution with a New Name

UTAH STATE UNIVERSITY
A LAND-GRANT INSTITUTION

Utah State University is an old, well-established institution now carrying the new name, Utah State University of Agriculture and Applied Science. It is one of Utah's oldest educational institutions, founded March 8, 1888 as the Agricultural College of Utah. In 1929 the Utah State Legislature changed its name to Utah State Agricultural College, and on March 8, 1957, it became Utah State University of Agriculture and Applied Science by action of the 32nd Utah State Legislature.

The new name recognizes the status achieved by this institution as it grew in educational stature to meet its broad objectives set forth in the basic charter. Under the new name, Utah State University will continue to be faithful to its Federal and State charters in providing the practical and applied aspects of the agricultural, physical and biological sciences, social sciences, the humanities and the arts, and provide at low cost a "liberal" as well as "practical" education to the sons and daughters of the "industrial classes in the several pursuits and professions of life." Utah State's variety of educational offerings is indicated by its seven colleges: Agriculture; Business and Social Sciences; Education; Engineering and Technology; Forest, Range and Wildlife Management; Home and Family Living; University College; and the School of Graduate Studies.

With more than sixty departments from which to choose, you will be able to prepare yourself for leadership in the State and Nation.
UNIVERSITY CALENDAR

AUTUMN QUARTER

September 18, Wednesday
   General Staff Meeting for University, its Divisions and Branches

September 23, Monday
   University Faculty Meeting

September 26, 28, Thursday and Saturday
   Orientation and Guidance Tests for all new students

September 27, Friday
   Registration of all new students (according to alphabetical schedule)

September 28, Saturday
   Registration of all former students (according to alphabetical schedule)

September 30, Monday
   Class Instruction Begins

October 1, Tuesday
   Late Registration Fee Effective

October 18, Friday
   Last Day for adding courses or changing sections

October 19, Saturday
   Homecoming

November 15, Friday
   Last Day for dropping courses

November 28, 29, Thursday and Friday
   Thanksgiving Recess

December 16-19, Monday-Thursday
   Final Examination Week

December 19, Thursday
   Autumn Quarter Closes

WINTER QUARTER

January 3, 4, Friday and Saturday
   Registration of all students (according to alphabetical schedule)

January 6, Monday
   Class Instruction Begins

January 7, Tuesday
   Late Registration Fee Effective

January 24, Friday
   Last Day for adding courses

February 21, Friday
   Last Day for dropping courses
Academic Year 1957-58

March 17-20, Monday-Thursday
Final Examination Week

March 20, Thursday
Winter Quarter Closes

SPRING QUARTER

March 24, Monday
Registration of all students (according to alphabetical schedule)

March 25, Tuesday
Class Instruction Begins

March 26, Wednesday
Late Registration Fee Effective

April 11, Friday
Last Day for adding courses or changing sections

May 9, Friday
Last Day for dropping courses
(7th wk.)

June 2-5, Monday-Thursday
Final Examination Week

June 5, Thursday
Spring Quarter Closes

June 6, Friday
Baccalaureate

June 7, Saturday
Sixty-fifth Annual Commencement Exercises

SUMMER (1958)

June 16, Monday
First Session Begins

July 18, Friday
First Session Closes

July 21, Monday
Second Session Begins

August 22, Friday
Second Session Closes

1958

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CONTENTS

Board of Trustees ......................................................... 8
Officers of Administration ................................................ 8
USU Faculty .......................................................................... 11
College of Southern Utah Faculty ......................................... 32
Snow College Faculty ........................................................ 35
General Information .......................................................... 37
History and Organization .................................................... 37
Academic Colleges and Departments ...................................... 38
Accreditation ........................................................................ 39
Buildings ............................................................................ 40
Libraries ............................................................................... 41
Branch Colleges .................................................................... 42
USU Alumni Association ...................................................... 43
Admission ............................................................................ 44
Registration and Credits ..................................................... 45
Lower Division ..................................................................... 48
Upper Division ..................................................................... 49
Graduation ........................................................................... 50
Student Fees .......................................................................... 52
Student Services and Activities ............................................. 54
Student Organizations .......................................................... 56
Scholarships, Awards and Honors .......................................... 57
Student Employment ............................................................ 64
Student Housing ................................................................... 65
Orientation ............................................................................ 68
Religion ................................................................................ 68
School of Graduate Studies ................................................... 70
  Master of Science Degree .................................................. 70
  Master of Education Degree ............................................... 72
  Master of Forestry Degree ................................................ 72
  Degree of Civil and Irrigation Engineering ......................... 72
  Doctor of Philosophy Degree ............................................ 73
  Doctor of Education Degree ............................................. 73
College of Agriculture ......................................................... 77
  General Agriculture .......................................................... 79
  Specialized Agriculture ..................................................... 80
  Agricultural Economics ..................................................... 81
  Agricultural Education ...................................................... 83
  Agronomy ........................................................................ 85
  Animal Husbandry ............................................................ 89
  Applied Statistics ............................................................. 92
  Botany and Plant Pathology .............................................. 93
  Dairy Industry ................................................................. 94
  Horticulture .................................................................... 97
  Poultry Husbandry ........................................................... 100
  Veterinary Science .......................................................... 102
  Agricultural Experiment Station ....................................... 103
  Cooperative Extension Service ......................................... 105
College of Business and Social Sciences ............................... 108
  Business Administration .................................................. 108
    Accounting .................................................................... 109
    Management .................................................................. 110
    Business Education ...................................................... 111
    Industrial Management ................................................ 111
    Merchandising .............................................................. 113
    Secretarial Science ....................................................... 113
  Economics ........................................................................ 117
  History and Political Science ............................................. 119
  Pre-Legal Program ........................................................... 123
  Social Science .................................................................. 124
  Sociology ......................................................................... 124
  Division of Social Work .................................................... 126
College of Education .......................................................... 130
Teacher Placement Service .................................................. 130
Teacher Certification .......................................................... 131
Department of Education ...................................................... 131
Fine Arts ............................................................................. 137
Visual Arts ............................................................................ 137
Drama .................................................................................. 140
Music ................................................................................... 142
Library Science ...................................................................... 145
Health, Physical Education and Recreation .............................. 146
Psychology and Guidance .................................................... 154
College of Engineering and Technology ............................... 162
Division of Engineering ....................................................... 162
Engineering Drawing ............................................................ 164
Agricultural Engineering ....................................................... 165
Chemical Engineering ............................................................ 166
Civil and Irrigation Engineering ............................................. 167
Electrical Engineering ........................................................... 174
Tool Engineering .................................................................. 178
Engineering Experiment Station ............................................ 181
Division of Technology ........................................................ 181
Aeronautical Technology ....................................................... 182
Automotive Technology ........................................................ 185
Industrial Education ............................................................. 188
Industrial Arts ...................................................................... 189
Trade and Industrial Education .............................................. 190
Woodwork and Building Construction ................................... 191
Two-Year Vocational Technical Program .............................. 191
Welding ............................................................................... 195
College of Forest, Range and Wildlife Management .............. 199
Range Management .............................................................. 201
Wildlife Management ............................................................ 204
Forest Management .............................................................. 208
College of Home and Family Living ....................................... 215
Child Development and Parent Education ............................. 217
Clothing, Textiles and Related Arts ....................................... 218
Foods and Nutrition ............................................................. 220
Household Administration .................................................... 222
Home Economics Education ............................................... 224
University College ............................................................... 227
General Education ............................................................... 228
Integrated Courses ............................................................... 228
Philosophical Literature ....................................................... 229
Pre-Medical Training ............................................................ 230
Medical Technology ............................................................. 231
Pre-Dental Training .............................................................. 231
Bacteriology and Public Health ............................................. 232
Chemistry ........................................................................... 234
English and Journalism ........................................................ 239
Photography and Photographic Journalism .......................... 244
Geology .............................................................................. 244
Landscape Architecture and Planning ................................... 246
Liberal Studies ..................................................................... 247
Mathematics ....................................................................... 248
Modern Languages and Latin .............................................. 250
Physics .............................................................................. 253
Speech .................................................................................. 255
Zoology .............................................................................. 259
Military Science and Tactics and Air Science ...................... 263
Army ROTC ........................................................................ 266
Air Force ROTC .................................................................. 270
University Summer School .................................................. 275
Home Study Division ......................................................... 275
Off-Campus Instruction ....................................................... 277
Summary of 1956-57 Attendance .......................................... 278
Alma Sonne, Chairman ....................................................... Logan
Fern B. Ercanbrack, Vice-Chairman .................................. Provo
Newell V. Sanders .......................................................... Kaysville
R. J. Potter ................................................................. Garland
Eve S. Ashton ....................................................................... Vernal
L. Glen Garrett ..................................................................... Ogden
Henry R. Hurren ................................................................... Logan
L. N. Marsden ....................................................................... Cedar City
Ralph S. Blackham ................................................................ Moroni
David W. Evans ................................................................... Salt Lake City
Joseph Rosenblatt .................................................................. Salt Lake City
D. Bennie Schmiett ............................................................... Roosevelt
Lamont F. Toronto, Secretary of State (ex-officio) ............... Salt Lake City
Wesley D. Soulier, President, Alumni Association (ex-officio) Salt Lake City
L. Mark Neuberger, Secretary to the Board ......................... Logan

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Daryl Chase ........................................................................... President
L. Mark Neuberger ............................................................... Dean of Academic Administration
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R. H. Walker ........................................................................... Dean, College of Agriculture
Milton R. Merrill ..................................................................... Dean, College of Business and Social Sciences
John C. Carlisle ....................................................................... Dean, College of Education
Dean F. Peterson, Jr. ............................................................. Dean, College of Engineering and Technology
Lewis M. Turner .................................................................... Dean, College of Forest, Range and Wildlife Management
Una Vermillion .................................................................... Acting Dean, College of Home and Family Living
J. Elliot Cameron ..................................................................... Director, Snow College
Royden C. Braithwaite ............................................................ Director, College of Southern Utah
Carlton Culmsee .................................................................... Dean, University College

Carl Frischknecht .................................................................. Director, Cooperative Extension Service
D. Wynne Thorne .................................................................... Director, Experiment Station and Research
LeRoy A. Blaser ...................................................................... Director, Information Services and University Development

Ellvert H. Himes .................................................................... Director of Student Services
H. B. Hunsaker ....................................................................... Director of Athletics
Lee Grande Noble .................................................................. Director, Summer School, Off-Campus Instruction and Evening School

Milton Abrams ........................................................................ Librarian
Asa L. Beecher ....................................................................... Acting Registrar
Hazel M. Johnson .................................................................... Women's Activities Counselor
Harold M. Wadsworth ........................................................... Superintendent of Plant Operation and Maintenance
EMERITUS FACULTY

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

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

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

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

Boswell, Stephen R., B.S.
Professor Emeritus, County Agricultural Agent

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

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

Caine, George B., B.S., M.A.
Professor Emeritus of Dairy Industry

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

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

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

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

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

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

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

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

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

Humphreys, L.R., B.S.
Professor Emeritus of Agricultural Education

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

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

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

Lund, Nettie B., B.S.
Professor Emeritus, Extension Service
Maeser, Sherwin, A.B., Ph.D.
   Professor Emeritus of Chemistry

Manning, Wm. H., A.B.
   Professor Emeritus of Music

Martineau, V. L., B.S.
   Professor Emeritus Extension Service

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

Nichols, Delore
   Professor Emeritus, County Agricultural Agent

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

Pittman, Don W., B.S., M.S.
   Professor Emeritus of Agronomy

Preston, William B. III, M.D.
   Professor Emeritus of Physiology

Richards, B. L., B.S., M.S., Ph.D.
   Professor Emeritus, Botany and Plant Pathology

Sharp, David, Jr., B.S.
   Professor Emeritus, Extension Service

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

Sorenson, C. J., B.S., M.S.
   Professor Emeritus of Entomology

Smith, Albert E., B.S.
   Professor Emeritus, County Agricultural Agent

Stanford, J. Sedley, B.S., Ph.D.
   Professor Emeritus of Zoology and Entomology

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

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

Thomas, W. P., B.S., M.S., Ph.D.
   Professor Emeritus, Agricultural Economics

Tingeay, V. H., B.S., M.S.
   Professor Emeritus of Mathematics

Vickers, Wallace J., B.S., M.S., Ph.D.
   Professor Emeritus of English

Wrigley, R. L., B.S.
   Professor Emeritus, Extension Service
FACULTY

Daryl Chase, B.A., M.A., Ph.D.
President

Abrams, Milton, B.S., M.S.
Associate Professor
Librarian

Acord, Clair Reid, B.S.
Associate Professor, Utah County Agricultural Agent

Adams, Doris, B.S.
San Juan County Home Agent

Allen, Bert V.
Instructor in Photography
Head Photographic Service

Allen, Milton, B.S., M.S.
Associate Professor, Utah County Agricultural Agent

Allred, A. Fullmer, B.S.
Assistant Professor, Box Elder County Agricultural Agent

Allred, Keith Reid, B.S., Ph.D.
Assistant Professor of Agronomy

Allred, A. Fullmer, B.S.
Assistant Professor of Agronomy

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

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

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

Angus, Robert, Major, USAF, B.S.
Assistant Professor of Air Sciences

Argyle, Rell F., B.S.
Assistant Professor, Morgan County Agricultural Agent

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

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

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

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

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

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

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

Barker, James R., B.S.
Assistant Professor of Civil and Irrigation Engineering

Barlow, Joel C., B.S.
Assistant Professor, Utah County Agricultural Agent

Barnard, John Jefferson, B.S.
Assistant Professor, Utah County Agricultural Agent
Bate, Elsa B., B.S., M.S., Ph.D.
Professor of Home Administration
Head, Department of Home Administration

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

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

Bauer, Norman, B.S., M.S., Ph.D.
Associate Professor of Chemistry

*Beckstrand, Gordon L., B.S.
Assistant Professor, Assistant 4-H Club Leader

Beecher, Asa L.
Acting Registrar, Veterans’ Coordinator

Bell, James H., B.S., D.V.M.
Assistant Professor of Veterinary Science

Bell, William H., B.S., M.S.
Professor of Business Administration

Bendixsen, Kay Reed, B.S., M.S.
Assistant Professor, Garfield County Agricultural Agent

Bennett, James A., B.S., M.S., Ph.D.
Professor of Animal Husbandry
Head, Department of Animal Husbandry

Bennett, William H., B.S., M.S., Ph.D.
Professor of Agronomy
Assistant Director, Cooperative Extension Service

Berger, Robert L., B.S., M.S., Ph.D.
Assistant Professor of Physics

Bergstrom, Helen Evans, B.S., M.S.
Assistant Professor, Morgan County Home Agent

Beutler, G. Leon, B.S.
Instructor in Library Science
Head, Audio-Visual Aids Library

Beyers, John M., B.A., M.A.
Assistant Professor of English and Modern Languages

Biddulph, Clyde, A.B., M.Ph., Ph.D.
Professor of Physiology

Biggs, Ernest O., B.S.
Assistant Professor, Tooele County Agricultural Agent

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

Black, Asa C., Colonel, B.S., Ch.E.
Professor of Military Science and Tactics

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<table>
<thead>
<tr>
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<th>Title</th>
<th>Department</th>
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<tbody>
<tr>
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<td></td>
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<tr>
<td>Krieger, Chester G.</td>
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<tr>
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<tr>
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<tr>
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<td>Lewis, Dorothy B.</td>
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<td>Lewis, Evelyn Hodges</td>
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<td>Lewis, William P.</td>
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<tr>
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Reese, Lowell Grant, B.S., M.S.
Instructor in English

Reynolds, H. Reuben, Graduate, Chicago Art Institute
Professor of Fine Arts

Rice, Moyle Q., B.S., M.A.
Professor of English

Rich, Lloyd Elliott, B.S., M.S.
Associate Professor of Civil Engineering

Rich, Lyman H., B.S., M.S.
Professor of Dairy Industry, Extension Specialist

Rich, Wayne R., B.S., M.S.
Assistant Professor of Mathematics

Richards, Lewis, B.A., M.A.
Assistant Professor of English
Richardson, Stanley S., B.S., M.S.
Professor of Agricultural Education
Head, Department of Agricultural Education

Rickenbach, Rodney G., B.S.
Associate Professor, Millard County Agricultural Agent

Rickers, Alvin E., Captain, USAF, B.S.
Assistant Professor of Air Science

Ricks, Joel E., A.B., A.M., Ph.D.
Professor of History

Riethmann, Otto
Instructor in Horticulture

Roberts, Bee., B.S.
Instructor in Elementary Education

Roberts, N. Keith, B.S., M.S.
Associate Professor of Agricultural Economics

*Robinson, Max E., B.S., M.S.
Assistant Professor of Range Management

Robinson, Rex E., B.S., M.A., Ph.D.
Professor of Speech

Rogers, Lehi S., B.S.
Assistant Professor, Davis County Agricultural Agent

Rose, D. Wayne, B.S.
Assistant Professor, Kane County Agricultural Agent

Roskelley, R. Welling, B.S., M.S., Ph.D.
Professor of Sociology
Head, Department of Sociology

Rowland, Priscilla, B.S., M.S.
Assistant Professor of Foods and Nutrition

Salunkhe, Dattajeera K., B.S., M.S., Ph.D.
Assistant Professor of Horticulture

Sharp, Heber Cannon, B.S., M.S., Ph.D.
Associate Professor of Psychology

Shaw, Edith Smith, B.S., M.A.
Associate Professor of Education

*Shaw, Richard J., B.S., M.S.
Assistant Professor of Botany

Shipley, John R., Captain, USAF, B.M.E., M.M.
Assistant Professor of Air Science

*Shupe, LeGrand, B.S., M.S., D.V.M.
Associate Professor of Veterinary Science

Sigler, William F., B.S., M.S., Ph.D.
Professor of Wildlife Management
Head, Department of Wildlife Management

Singleton, Ansel O., Captain, USAF, B.A.
Assistant Professor of Air Science

Sjoblom, Wallace, B.S.
Assistant Professor, Iron County Agricultural Agent

*On leave.
FACULTY

Skidmore, C. Jay, B.S., M.S., Ed.D.
Associate Professor of Sociology

Slaugh, Owen, B.S.
Associate Professor of Automotive Mechanics
Head, Department of Automotive Technology

Smart, Ross A., B.S., D.V.M.
Assistant Professor of Veterinary Science

Smith, Albert B., B.S.
Instructor in Engineering Drawing

Smith, Anna Marie, A.B., B.S.L.S.
Instructor in Library Science

Smith, Arthur D., B.S., M.S., Ph.D.
Professor of Range Management

Smith, Hubert W., B.A., M.S., Ph.D.
Professor of English

Smith, R. L., B.S., M.S., Ph.D.
Assistant Professor of Agronomy

Smith, William Lloyd, B.S.
Assistant Professor, Duchesne District Agricultural Agent

Smith, Winslow Whitney, A.B., A.M., Ph.D.
Professor of Bacteriology and Public Health
Head, Department of Bacteriology and Public Health

Sorenson, Evan J., B.S., M.S.
Instructor in Physical Education
Freshman Football Coach

Starkey, Eugene E., B.S., M.S.
Assistant Professor of Dairy Industry

Steffen, Hyrum, B.S., M.S.
Associate Professor of Animal Husbandry

*Stenquist, Lee B., B.S.
Internal Auditor

Stevens, Kenneth R., B.S., M.S., Ph.D.
Professor of Bacteriology and Public Health

Stevens, Velyn B., B.S.
Assistant Professor, Juab County Home Agent

Stevenson, Evan N., B.S.
Manager of Student Union

Stewart, John J., B.S., M.S.
Assistant Professor of Journalism
Editor of University Publications

Stoddard, George E., B.S., Ph.D.
Professor of Dairy Industry

Stoddard, Laurence A., B.S., M.S., Ph.D.
Professor of Range Management
Head, Department of Range Management

Stoker, Golden L., B.S., M.S.
Associate Professor of Agronomy

Stokes, Allen W., B.S., M.A., Ph.D.
Associate Professor of Wildlife Management

*On leave.
Stokes, L. Darrell, B.S.
Associate Professor, Davis County Agricultural Agent

Stone, David R., B.A., M.A., Ph.D.
Associate Professor of Psychology

Street, Joseph C., B.S., M.S., Ph.D.
Assistant Professor of Animal Husbandry

Stringham, Glen E., B.S.
Instructor in Agricultural Engineering

Strong, Chester Douglas, B.S., M.S.
Assistant Professor of Agricultural Economics

Summers, Lowell P., B.S., M.S.
Associate Professor of Aeronautics
Acting Head, Department of Aeronautics

Swenson, Dan H., B.S., M.S.
Assistant Professor of Industrial Education

Swindle, Karma P., B.S.
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Taylor, J. Golden, B.S., M.A.
Assistant Professor of English

Taylor, Morris H., B.S., M.S.
Associate Professor of Agricultural Economics,
Extension Livestock Marketing Specialist

Taylor, Sterling A., B.S., M.S., Ph.D.
Professor of Agronomy

Taylor, Thomas, B.S.
Instructor in Elementary Education

Tensmeyer, Lowell George, B.S., Ph.D.
Assistant Professor of Chemistry

urasawa, Haruko, B.A., M.S.
Instructor in Clothing, Textiles and Related Arts

Tezak, William V., B.A., M.B.A.
Assistant Professor of Business Administration

Thain, Aldyth, B.S., M.A.
Associate Professor of Languages

*Thatcher, Ray A., B.S.
Assistant Professor, Morgan County Agricultural Agent

Thomas, Don W., B.S., D.V.M.
Associate Professor of Veterinary Science, Extension Specialist

Thomas, J. Alan, D.V.M.
Assistant Professor of Veterinary Science

Thorne, D. Wynne, B.S., M.S., Ph.D.
Professor of Agronomy
Director, Agricultural Experiment Station and University Research

Thorley, Gwendella, B.S., M.S.
Assistant Professor of Speech

Thorpe, Everett C., B.S., M.F.A.
Associate Professor of Fine Arts

*On leave.
FACULTY

Tilley, Derald A., 1st Lt., B.S.
Assistant Professor of Military Science and Tactics

Tingey, D. C., B.S., M.A.
Professor of Agronomy

Tingey, Willis A., B.S.
Assistant Professor of Civil Engineering

Tippetts, Ruth P., B.S.
Associate Professor, Consumer Marketing Information Agent

Tippetts, Twain, B.S., M.A.
Associate Professor of Fine Arts
Head, Department of Fine Arts

Tocher, Stewart Ross, B.S., M.S.F.
Associate Professor of Forest Management

Tueller, Lamont E., B.S.
Associate Professor, Cache County Agricultural Agent

Turner, John Howard, B.S.
Instructor and Research Assistant in Zoology

Turner, Lewis M., B.S., M.S., Ph.D.
Professor of Forest Management
Dean, College of Forest, Range, and Wildlife Management

Tuttle, Sarah S., B.S.
Associate Professor, Sanpete County Home Agent

Van Epps, Gordon, B.S., M.S.
Assistant Professor of Agronomy

Van Orden, Harris O., B.S., M.S., Ph.D.
Associate Professor of Chemistry

Vermillion, Una, A.B., M.A.
Professor of Foods and Nutrition
Acting Dean, College of Home and Family Living
Head, Department of Foods and Nutrition

Wadsworth, Harold M., B.S.
Superintendent of Plant Operations and Maintenance

Wadsworth, J. Donald, B.S., M.S.
Assistant Professor of Agricultural Engineering, Extension Specialist

Walker, R. H., B.S., M.S., Ph.D.
Professor of Agriculture
Dean, College of Agriculture

Wallis, Carl R., B.S., M.S.
Assistant Professor of Engineering Drawing

Wamsley, Helen J., B.S.
Assistant Professor, Rich County Home Agent

Wassermann, Irving, M.L.
Associate Professor of Fine Arts

Watkins, Bruce O., B.S., M.S., Ph.D.
Associate Professor of Electrical Engineering

Watkins, Reynold K., B.S., S.M.
Associate Professor of Civil Engineering
Welkie, George W., B.S., M.S., Ph.D.
Assistant Professor of Botany and Plant Pathology

Welte, Walter, B.A., M.A., Mus. D. (Honorary)
Professor of Fine Arts

Wiebe, Herman H., B.A., M.S., Ph.D.
Associate Professor of Botany and Plant Pathology

Wiggins, Evelyn L., B.S.
Instructor in Elementary Education

Wiggins, Janet Francine, B.S.
Instructor in Elementary Education

Wilcox, Ethelwyn B., B.S., M.S. Ph.D.
Professor of Foods and Nutrition

Willey, Lynn R., B.S., M.S.
Assistant Professor of Automotive Technology

Williams, J. Stewart, B.S., M.A., Ph.D.
Professor of Geology
Head, Department of Geology
Dean, School of Graduate Studies

Williamson, David O., B.S.
Research Associate in Animal Husbandry

Wilson, David Parry, B.S., M.S., Ed.D.
Collaborator in Teacher Training

Wilson, Lemoyne, B.S., M.S.
Associate Professor of Agronomy

Wood, John K., B.S., M.S., Ph.D.
Professor of Physics
Acting Head, Department of Physics

Wright, E. Wayne, B.A., M.A., Ed.D.
Assistant Professor of Psychology
Coordinator of Counseling Services

FEDERAL COLLABORATORS

Benson, Norman G., B.S., M.A., Ph.D.
U. S. Fish and Wildlife Service, Fishery Research

Binns, Wayne, M. S., D.V.M.
Agricultural Research Service

Bulkley, Ross V., B.S., M.S.
U. S. Fish and Wildlife Service, Fishery Research

Carlson, John Wilford, B.S., M.S., Ph.D.
Agricultural Research Service

Cope, Oliver B., B.A., M.A., Ph.D.
U. S. Fish and Wildlife Service, Fishery Research

Cox, H. C., B.S., M.S., Ph.D.
Agricultural Research Service

Cronin, Eugene Hyrum, B.S., M.S.
Agricultural Research Service
Dewey, Douglas R., B.S., M.S., Ph.D.  
Agricultural Research Service

Dorst, Howard Earl, A.B., A.M.  
Agricultural Research Service

Fitzgerald, Paul Ray, B.S., M.S.  
Agricultural Research Service

Haddock, Jay Lamar, B.S., M.S., Ph.D.  
Agricultural Research Service

Hawthorn, Leslie Rushton, B.S., M.S.  
Agricultural Research Service

Hugie, Vern Keam, B.S., M.S.  
Soil Conservation Service

Hull, Alvin C., Jr., B.S., M.S.  
Agricultural Research Service

Lauritzen, Cyril Walker, B.S., M.S., Ph.D.  
Agricultural Research Service

Levin, Marshall David, A.B., M.S.  
Agricultural Research Service

Linton, Denton Coolidge, B.S.  
Agricultural Research Service

Low, Jessop Budge, B.S., M.S., Ph.D.  
Wildlife Research Unit

Metcalf, John W., A.B.  
Soil Conservation Service

Mielke, James Leroy, B.S.F., M.S., Ph.D.  
Forest Service

Nye, William Preston, B.S., M.S.  
Agricultural Research Service

Pearson, Gregory Leslie, B.S., M.S.  
Soil Conservation Service

Pedersen, Marion Walter, B.S., M.S., Ph.D.  
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Stewart, Clyde Everett, B.S., M.S., Ph.D.  
Agricultural Research Service

Thorne, James Parry, B.S., M.S.  
Soil Conservation Service

Wadley, Bryce Nephi, B.S., M.S., Ph.D.  
Agricultural Research Service

Willardson, Lyman, B.S., M.S.  
Agricultural Research Service

Williams, Coburn, B.S., M.S., Ph.D.  
Agricultural Research Service

Woodward, Rollo William, B.S., M.S., Ph.D.  
Agricultural Research Service
CONSULTANTS
U.S. Public Health Service
Communicable Disease Center, Technology Branch
Logan Field Station Section

Hess, Archie D., B.S., M.S., Ph.D.
Chief of Section
Scientist Director

Rainey, Marshall B., B.S.
Assistant Chief
Public Health Engineer

Dow, Richard P., A.B., M.S., Ph.D.
Sr. Scientist

Harmston, Fred C., B.S.
Sanitarian (R)

Martin, Carl B., B.C.E., M.S.C.E.
SA Sanitary Engineer

McHugh, Robert A., A.B.
Biologist (Ecology)

Ogden, Louis J., B.S., M.S.
Sr. Sanitarian

Smith, James V., B.S., M.S., M.P.H.
Sanitarian

COLLEGE OF SOUTHERN UTAH
FACULTY

Braithwaite, Royden C., B.S., Ph.D.
Director

*Ashcroft, Theron, B. S.
Associate Professor of Physics and Engineering
Chairman, Division of Engineering and Mathematics

Bastow, Mary, B.S.
Professor Emeritus of Art

Boal, Robert McKee, Major
Associate Professor of Air Science

Carpenter, Ada, B.S.
Assistant Professor of Home and Family Living

Clark, Gwyn R., B.S., M.S.
Associate Professor of Elementary Education and English
Supervisor, Teacher Training

Cloward, McRay, B.S., Ed.M.
Assistant Professor in Business and Education, and Coordinator of Housing

Cooley, Charles B., B.S., Ed.M.
Professor of Industrial and Vocational Education
Chairman, Division of Industrial and Vocational Education

*On leave.
Cooley, Hazen, B.S., M.B.A.
   Professor of Business
   Secretary and Treasurer

Dalley, Parley, B.S., M.S., ScD.
   Professor Emeritus of Physical Sciences

Davis, Victor
   Instructor in Auto Mechanics

Duncan, Audrey
   Head of Stenographic Bureau

Dunkin, Hubert, T/Sgt.
   Administrative Assistant, USAF

Fillerup, Joseph M., B.S., M.A., Ed.D.
   Assistant Professor of Education
   Chairman, Division of Education and Summer Session

Gillies, Richard E., B.S.
   Instructor in Social Science
   Coordinator of Student Activities

Halversen, Roy L., B.S.
   Professor of Music and Education
   Chairman, Music Department

Hardy, Eugene, B.S.
   Assistant Professor of Industrial Education

Hatch, Conrad V., B.S., M.S.
   Assistant Professor of Physical Sciences and Chemistry
   Chairman, Division of Physical Sciences

Holmer, Ralph R., Captain
   Assistant Professor of Air Science

Johnson, Blaine, B.S., M.A., Ed.D.
   Assistant Professor of Music and Education

Jones, Eulalia I., B.A.
   Librarian, Instructor in Education

Kupfer, Vern K., B.S., M.S.
   Assistant Professor of Psychology and Social Science
   Chairman, Health and Counseling Service

Krudger, Marie, B.S.
   Assistant Professor of Home and Family Living

LeBaron, George L., B.S., M.S.
   Assistant Professor of Physics and Physical Science

Magleby, V.R., B.S., M.S.
   Assistant Professor of Agriculture and Biology

Manning, William H., A.B.
   Professor Emeritus of Music

Matthews, Darrell H., B.S.
   Assistant Professor of Animal Husbandry

Ogden, Phil R., B.S., M.S.
   Assistant Professor of Range Management

Osborne, Bruce H., B.S.
   Instructor in Physical Education
   Athletic Coach

Petty, Cleo M., B.S.
   Assistant Professor of Physical Education
   Athletic Coach
Plummer, J. H., B.A., M.A.
   Associate Professor of English
   Dean of Instruction
   Chairman, Division of Humanities, English, and Fine Arts
Reeves, Jeniel, B.A.
   Instructor in Physical Education
Robb, Ward S., B.S.
   Registrar
   Veterans’ Coordinator
*Robinson, Max E., B.S., M.S.
   Assistant Professor of Range Management
Rowley, Richard M., B.S., M.A.
   Assistant Professor of English and Speech
Sargent, David L., B.S., M.S.
   Professor Emeritus of Biology
Schmutz, D. Clarence, B.A., M.A.
   Associate Professor of Agricultural Economics
   Chairman, Division of Agriculture
Stephenson, A. W., B.S., M.B.A.
   Associate Professor of Business
   Chairman, Division of Business and Social Science
   Coordinator, Student Employment
Stout, Shirley Gardner, B.S.
   Instructor of Secretarial Science
Wahlquist, A. Glenn, B.S., M.S.
   Associate Professor of Agronomy and Biology
   Chairman, Division of Biological Science
Weaver, Max D., B.S., M.S.
   Assistant Professor of Art
Woolf, Eugene T., B.A., M.A.
   Assistant Professor of English and Speech

OTHER MEMBERS OF STAFF

Matheson, Edward G., Superintendent of Heat Plant and Grounds
Cox, R. Reid, Superintendent of Maintenance
Rigby, Eldro, Manager of Campus Farm
Roberts, Joseph, Superintendent of Buildings
Orton, Twenty, Herdsman, Experimental Sheep
Smith, T. Gordon, Valley Farm Assistant

ACCREDITED INSTRUCTORS COOPERATING WITH C. S. U.

The elementary teachers of Iron County School District serve as critic teachers in the Division of Education.

Felt, Paul E., Director, L. D. S. Institute of Religion
Hansen, Aaron A., Instructor, L. D. S. Institute of Religion
Dahl, Paul E., Instructor, L. D. S. Institute of Religion
Helland, Eugene, Director, C. S. U. Band
Johnson, Mrs. Blaine, Special Instructor in Music
Jones, Bernella, Special Instructor in Music
Thorley, Max J., Special Instructor in Music

On leave.
SNOW COLLEGE

OFFICERS OF ADMINISTRATION

Cameron, J. Elliot, B.S., M.S.
   Director

Thompson, Lee R., B.S.
   Treasurer

Findlay, Ross, B.S., M.S.
   Dean of Students, Registrar

Clark, Winnie H., B.S.
   Women's Counselor

Olsen, Ruth
   Librarian

Stout, Fonda
   Manager of Bookstore

Olsen, Goldie
   Manager of Cafeteria

Peterson, Hilmer
   Supt. Buildings and Grounds

Bailey, Fred
   Custodian

Alder, Ivan
   Maintenance Supervisor

FACULTY

Allred, Fred L., B.S., M. Ed.
   Assistant Professor of English

Bradley, Merritt E., B.S., M.S.
   Assistant Professor of Building Trades
   Chairman, Division of Industrial and Vocational Education

Cameron, J. Elliott, B.S., M.S.
   Director
   Professor of Education

Christensen, H. Reed, B.S., M.S., Ph.D.
   Professor of Mathematics and Physics
   Chairman, Division of Physical Sciences and Mathematics

Chugg, David, M.S.
   Assistant Professor of Music

Clark, Winnie H., B.S.
   Instructor in Women's Physical Education

Crane, Joseph W., B.A., M.A., Associate Professor of Speech

Dean, H. A., B.S., M.S.
   Professor of Music

Findlay, Ross, B.S., M.S.
   Assistant Professor of Social Sciences

Gray, A. Russell, B.S., M.S.
   Associate Professor of Social Science and Modern Languages
   Chairman, Division of Social Science
Hanson, Afton, B.S., M.S.
Assistant Professor of Biology
Chairman, Division of Agriculture and Life Sciences

Hatton, Marlene, M.S.
Instructor of Home Economics

Holm, Floyd S., B.S., M.S.
Associate Professor of Education
Chairman, Division of Education and Social Science

Jensen, Halbert, M.B.A.
Instructor of Business Administration

Jensen, LaVar
Piano Instructor

Mangelson, Farrin L., B.S., M.S.
Associate Professor of Chemistry

Olsen, Ruth, B.S.
Instructor in Library Science

Peterson, Rulon, B.S.
Instructor of Mathematics

Phillips, Lucy A., A.B., M.A.
Professor of English
Chairman, Division of Humanities

Ray, Nellie, B.S., M.A.
Associate Professor of Secretarial Science
Acting Chairman, Division of Business

Rockwood, C. LaVor, B.A.
Assistant Professor of Speech

Stoddard, Robert, B.S.
Instructor in Physical Education and Agriculture

Stout, Clayton
Instructor in Automotive Technology

Takasaki, Fred Y., B.A.
Instructor of Art

Thompson, Lee R., B.S.
Treasurer
Assistant Professor of Physical Education

Van Epps, Gordon, M.S.
Supervisor of the Experiment Farm
Assistant Professor of Agronomy

Woodbury, Darwin, B.S.
Instructor of Physical Education

SPECIAL INSTRUCTORS

Gleave, Ray H., B.S., M.A.
Director of L.D.S. Institute of Religion

McQuarrie, Harlow B., B.S., M.S., M.D.
Lecturer in Public Health

Van Epps, Gordon, B.S., M.S.
Assistant Professor
Research in Agronomy
GENERAL INFORMATION

UTAH STATE UNIVERSITY

General Information

Utah State University has one of the most beautiful campus settings in the country. High on an ancient delta of old Lake Bonneville, the University campus overlooks beautiful Cache Valley and Logan City, an ideal university community of some 17,000.

HISTORY AND ORGANIZATION

Utah State University and its Branch Colleges belong to that great family of educational institutions known as Land-Grant universities. Each state has at least one of these collegiate institutions which had their origin in 1862 when Abraham Lincoln signed the Morrill bill which created them. This bill provided for establishment of Land-Grant institutions by the grant of federal lands for their material support.

Utah State University operates under the constitution and laws of Utah which established the institution and its Agricultural Experiment Station in 1888 as a part of the public educational system of the state.

A twelve-member Board of Trustees appointed by the Governor with the consent of the state Senate is the governing body of the Institution. The Secretary of State and the President of the University Alumni Association serve as ex-officio members of the Board.

The Federal Land-Grant Act provided that the institutions in the system were: “without excluding other scientific and classical studies, including military science and 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 prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.”

The Utah Territorial Act of 1888 confirmed these purposes for the Institution and defined the offerings of the University to include: “The English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy, physiology and 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 to practical agriculture in the field.”

Chief executive officer of the University is the President. The dean of academic administration and the business manager, with members of the administrative council form the president’s “cabinet.”

The current President, Dr. Daryl Chase, who was appointed in 1954, is the tenth person to hold the office. Following President J. W. Sanborn in 1894 was J. H. Paul. Succeeding executives of the Institution were J. M. Tanner, 1896; W. J. Kerr, 1900; John A. Widtsoe, 1907; E. G. Peterson, 1916; Franklin S. Harris, 1945; Louis L. Madsen, 1950, and Henry Aldous Dixon, 1953.

THE OBJECTIVES OF UTAH STATE UNIVERSITY

The objectives of the University are stated specifically as follows in both its state and federal charters: “To teach such branches of learning as are related to agriculture and mechanic arts and such other scientific and classical studies as shall promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.”

All students, no matter what their specialty or ultimate professional or vocational aims, should have a sound liberal education with strong emphasis on the humanities, communication skills, and basic work in the social, biological, and physical sciences.
To achieve these objectives the Board of Trustees and the entire staff will work together with the idea that the investment in campus buildings, in the farms and research centers, and in all the administrative staff is significant only as it assists a given instructor to teach a given student better, a given research worker to make his research more productive, or a given extension service worker to reach more people effectively with the beneficial fruits of the research of the University.

ACADEMIC COLLEGES AND DEPARTMENTS

Training is offered in seven academic areas, and the School of Graduate Studies, listed here with departments included in each.

College of Agriculture
  General Agriculture
  Agricultural Economics
  Agricultural Education
  Agronomy
  Animal Husbandry
  Applied Statistics
  Botany and Plant Pathology
  Dairy Industry
  Horticulture
  Poultry Husbandry
  Veterinary Science

College of Business and Social Sciences
  Business Administration
    Accounting
    Business Management
    Business and Distributive Education
    Industrial Management
    Merchandising
  Economics
  History and Political Science
  Pre-Legal Training
  Secretarial Science
  Social Science
  Sociology and Social Work

College of Education
  Bureau of Education Research
  Teacher Education
  Administration (Graduate Program)
    Elementary
    Secondary
  Health, Physical Education and Recreation
  Edith Bowen Training School
  Fine Arts
    Art
    Drama
    Music
  Library Science
  Psychology and Guidance
  Vocational Education

College of Engineering and Technology
  Division of Engineering
    Engineering Drawing
    Agricultural Engineering
    Civil and Irrigation Engineering
    Electrical Engineering
    Tool Engineering
    Engineering Experiment Station
COLLEGES AND DEPARTMENTS

Division of Technology
  Aeronautical Technology
  Automotive Technology
  Industrial Education
    Industrial Arts
    Trade and Industrial Education
    Woodwork and Building Construction
  Welding

College of Forest, Range and Wildlife Management
  Forest Management
  Range Management
  Wildlife Management

College of Home and Family Living
  Two-Year Terminal Course in Home Economics
  Child Development and Parent Education
  Clothing, Textiles and Related Arts
  Foods and Nutrition
  Household Administration
  Home Economics Education

University College
  General Studies
  Philosophical Literature
  Pre-Medical Training
  Pre-Dental Training
  Bacteriology and Public Health
  Chemistry
  English and Journalism
  Photography and Photographic Journalism
  Geology
  Landscape Architecture and Planning
  Mathematics
  Modern Languages and Latin
  Physics
  Speech
  Zoology
  Entomology
  Physiology

ROTC
  Department of Military Science and Tactics
  Department of Air Science

ACCREDITATION

The University and all its departments are fully accredited. The University is accredited by the Northwest Association of Secondary and Higher Schools and is on the accepted list of the Association of American Universities and of the American Association of University Women. The University is a member of the American Council on Education and also is listed by other accrediting agencies.

The College of Education is a member of American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education.

College of Engineering and Technology is accredited by the American Society for Engineering Education, and its departments of electrical, agricultural and civil engineering are accredited by the Engineering Council for Professional Development.

College of Forest, Range and Wildlife Management is accredited by the Society of American Foresters and shares the University accreditation.

The University College shares in the accreditation of the University, and in addition its department of chemistry is accredited by the American Chemical Society.
BUILDINGS

MAIN: (M) Administrative and business offices including that of the president, dean of academic administration, business manager, student personnel office, dean of students, counseling and employment service, registrar's office, division of off-campus and home study, summer school, the colleges of Education, Business and Social Sciences, University College, and School of Graduate Studies.

STUDENT UNION: (UB) Union manager, program consultant, browsing library, book store, associated students, cafeteria, fountain, post office, KVSC studio, student publications offices, record library, student health service, ticket office, committee meeting rooms, barber shop, camera center, bowling, billiards, ping pong facilities, and television room.

HOME AND FAMILY LIVING: (HFL) College of Home and Family Living, lounge, home economics library, and pre-school laboratory.

FORESTRY: (F) College of Forest, Range and Wildlife Management, forestry library.

ENGINEERING: (E) College of Engineering and Technology, departments of civil, irrigation and drainage, and agricultural engineering, together with complete laboratories.

TECHNOLOGY: (T) Aeronautics and automotive technology.

MECHANIC ARTS: (MA) Industrial education, welding, electrical engineering and tool engineering.

SMART GYMNASIUM: (G) Department of health, physical education and recreation.

ELMER GEORGE PETERSON AGRICULTURAL SCIENCE: (PA) College of Agriculture, Extension Service, Experiment Station, agricultural bulletins, statistical lab (IBM), agronomy, horticulture, agricultural economics and marketing, and agricultural education and agricultural laboratories.

ANIMAL HUSBANDRY: (AH) Creamery, dairy industry, animal husbandry, and poultry husbandry.

PLANT INDUSTRY: (P) Intermountain Herbarium, bacteriology and public health, botany, plant pathology, physiology, laboratories, and electron microscope.

VETERINARY SCIENCE: (VS) Department of veterinary science.

EDITH BOWEN ELEMENTARY TRAINING SCHOOL: Moore children's library, elementary teacher training supervisors.

MILITARY SCIENCE: (MS) Departments of air and military science.

GEORGE NELSON FIELDHOUSE: (FH) Athletic department.

E. L. (DICK) ROMNEY STADIUM: Football, field and track sports.

UNIVERSITY APARTMENTS: Apartment-style living for single and married students.

ELLA V. REEDER RESIDENCE HALL: Apartment-style housing for single women.

JOHANNA MOEN RESIDENCE HALL: Apartment-style housing for single women.

ETHelyn O. GREAVES RESIDENCE HALL: Apartment-style housing for single women.

LUND HALL: Women's dormitory.

KERR HALL: Men's dormitory.

RURAL ARTS: Housing for visiting groups.

INFORMATION SERVICES AND ALUMNI: (ISA) Information Service, Alumni Association, Management Institute, Duplicating Service.
LIBRARY: (L) Main, reference, documentary and Hatch Memorial libraries, and English department.

WIDTSOE HALL: (W) Departments of physics and chemistry.

LDS INSTITUTE OF RELIGION: Services for Church of Jesus Christ of Latter-day Saints.

UTAH SCIENTIFIC RESEARCH FOUNDATION: University research affiliate.

HEATING PLANT: Central heating facilities.

MAINTENANCE: Maintenance, plant operations and car pool.

PURCHASING WAREHOUSE: Storage for equipment and supplies.

BOOK BINDERY: Operated by library.

U.S. FOREST SERVICE EQUIPMENT SHED

LIVESTOCK JUDGING PAVILION: For display of livestock.

GREEN HOUSES: Used in plant breeding and research.

BUILDING TG: (Temporary) Photography department.

BUILDING TD: (Temporary) Crop Improvement Association.

BUILDING TJ: (Temporary) Additional English department offices and class rooms.

BUILDING TI: (Temporary) Additional chemistry class rooms.

AMPHITHEATER: Outdoor theater.

MUSIC: Practice room for band and orchestra.

LIBRARIES

The University Library system consists of the Main Library and eight branches: Home and Family Living, Engineering, Forestry, Hatch Memorial, Claypool Map, Anne Carroll Moore Children's Library, Music, and the Audio-Visual Aids Library. All branches are centrally administered and centrally cataloged.

The Library has 200,000 bound books and periodicals, and unnumbered documents, pamphlets, maps, films, and microfilms, all available on a generous loan policy.

The Library is a depository with the United States Government Printing Office. Through an exchange agreement with universities, experiment stations, and extension services of the various states the Library receives their publications.

The Library is open to students, faculty and residents of the State of Utah daily except on legal holidays and Sundays.
Daryl Chase, President
Royden Braithwaite, Director

College of Southern Utah, founded in 1897, was first called the Branch Normal School of the University of Utah. With the growing need in southern Utah for agricultural development, a change of administration at the parent institution was effected in 1913, and the school then became a branch of Utah State University.

The College of Southern Utah has a large campus in Cedar City on which all the academic work is centered. In addition the branch college operates a 3,000-acre summer ranch for sheep and cattle herds and a valley farm where practical instruction in agriculture and livestock is centered.

There is on-campus housing for both men and women and for married students.

Eleven men have served as heads of CSU since its founding. The first four were known as principals and held office as follows while the school was a part of the University of Utah: Milton Bennion, 1897-1900; J. Reuben Clark, 1900-1901; Nathan T. Porter, 1901-1904; George W. Decker, 1904-1913. The remaining six men have been titled directors since the institution became a branch of Utah State University. They are Roy F. Homer, 1913-1921; P. V. Cardon, 1921-1922; J. Howard Maughan, 1922-1929; Henry Oberhansley, 1929-1945; H. Wayne Driggs, 1945-1951; Daryl Chase, 1951-1954. Dr. Royden Braithwaite was named director in January, 1955.

In 1948-49 courses leading to the bachelor's degree in elementary education were authorized by the Board of Trustees.

The first regular summer school of the college was held in 1949. In 1953 the Board of Trustees authorized the name change to College of Southern Utah.

The Extension Service and the Agricultural Experiment Station are closely connected with CSU. Deans of the parent institution supervise closely the work of the corresponding divisions at both branch colleges.

SNOW COLLEGE
Daryl Chase, President
J. Elliot Cameron, Director

Sanpete Stake Academy, founded in 1888 at Ephraim by the Church of Jesus Christ of Latter-day Saints, was first an elementary school. High school work was added in 1895. After normal studies were added as a fifth year in 1912, the institution became known as Snow Normal College.

It became a junior college in 1922 and since then has been called Snow College.

It was made a state junior college in 1932 and a branch of Utah State University July 1, 1951.

The College Plant includes the main campus, the athletic field, the college farm, dormitory and other housing units.

Administrators of the school have been: Alma Greenwood, 1888-1891; George C. Christensen, 1891-1892; Newton E. Noyes, 1892-1921; Wayne B. Hales, 1921-1924; Milton H. Knudsen, 1924-1933; I. Owen Horsfall, 1933-1936; James A. Nuttall, 1936-1952; Lester B. Whetten, 1953-1956. Elliot Cameron was named director July 1, 1956.
The Utah State University Alumni Association now numbers more than 22,000 members. These members constitute the graduates and former students who have been in attendance here at Utah State, and who are now making an effort to keep in touch with the University and support its activities through the work of the Association. Many of these members now hold important positions in industry and government.

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

**Membership.**

1. **Regular Member:** All persons receiving degrees, diplomas or terminal vocational certificates from Utah State University, College of Southern Utah, or Snow Branch are members of the Association upon payment of dues. All graduating students of USU receive a paid-up, two-year membership in the Alumni Association.

2. **Associate Member:** All students who have been regularly enrolled in one of the three aforementioned institutions and have successfully completed any work therein, may become members of the Association upon payment of dues.

3. **Sustaining Member:** All parents of graduates or students and faculty members and others who have shown an interest in the University or the Association may become sustaining members by payment of dues.

4. **Honorary Member:** Persons eligible for honorary membership are those who have done outstanding service to the Institution and who are recommended for this honor by the Executive Committee, or the Council.

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

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

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

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

**Alumni Association-Library Endowment Fund.** The Library Endowment Trust Fund is a special fund which has been established by the Association. This fund was established from popular subscriptions. Earnings from the funds are given to the University library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.
Admission to Utah State University is granted on the basis of an official application which includes transcripts of credit from schools previously attended. The Uniform Application for Admission to Utah Collegiate Institutions may be obtained upon request from any Utah high school principal, or from the Admissions Office of Utah State. All credentials should be submitted at least 30 days prior to the official registration date of the quarter in which enrollment is anticipated. Late presentation of credentials will cause inconvenience and delay in registration. Students who have difficulty in obtaining transcripts from schools previously attended may be given temporary permits to attend classes, but may not be officially registered until credentials are evaluated.

Students who register late as a result of late application are subject to the late registration fee.

The standard minimum requirement for admission to any college of the University is graduation from an approved high school in the United States or equivalent training in a country whose educational systems differ from that in the United States. Some colleges of the University, however, have special requirements for admission. Further details with reference to admission to individual colleges or programs may be found in the section of this catalog devoted to the college which offers the training desired.

Applicants who have not been graduated from high school may be admitted by presenting satisfactory evidence of ability to do university work. This evidence may be demonstrated by presentation of an official transcript showing collegiate work previously taken as an unmatriculated student, or by examination taken in advance of registration. Such examinations as College Board Entrance Examinations, Scholastic College Aptitude Test, or other approved standardized tests which provide appropriate appraisal of scholastic abilities of the applicant shall be accepted for fulfilling this requirement.

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

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

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

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

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

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

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

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

Students who expect to become candidates for any degree or diploma from any of the schools of the University 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 school advisor should plan the high school program of students so as to meet the requirements for admission to his chosen field of interest. Students who fail to do this may expect to be delayed in starting their college work until the prerequisite courses are made up. Not all of the schools and departments of the University have specified prerequisites, but those which do have, list them in their school and departmental section in this University catalog. This information should be used in planning the high school course.

Transfers from Other Colleges (Advanced Standing). The University does not grant collegiate credit for excess high school work. Advanced standing for work of satisfactory grade done in some other accredited college may be granted provided the student presents satisfactory evidence that the work offered is equivalent to the work for which he wishes it to be substituted.

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

REGISTRATION AND CREDITS

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

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

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

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

Registration is not complete until the student has presented his fee card at the cashier’s window, office of the Controller, and has paid his fees and filed his registration cards with the Registrar’s office.

Penalties for Late Registration and Late Registration Fee: $5.00 beginning second day after specified Registration Days; additional $1.00 for each additional day up to a maximum of $10.00.

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

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

The program of courses listed on the student’s registration card, approved by his dean and filed in the Registrar’s office, is considered to be the student’s official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official change-of-registration form is filed with the Registrar’s office before the deadline (end of the seventh week), an “F” grade will be recorded in case of failure to obtain a passing grade or an incomplete in any course for which the student has registered, regardless of the reason for the failure.
Regulations Pertaining to Withdrawal From Classes: Partial withdrawal: During the first three weeks of any academic quarter a student may withdraw from a class on his own initiative with the consent of his adviser, the instructor of the class, and the dean of his college.

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

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

Complete Withdrawal. If for any reason the student finds it necessary to leave the campus before the end of the quarter, he should take the necessary steps in accordance with the regulations specified above and before the student is allowed in completely withdrawing from the University are as follows: (1) Call at the Registrar's office for the necessary blank forms. (2) Complete forms as required and discuss problems relating to withdrawal with those whose signatures are to be obtained in the order designated for appropriate clearance. (3) Obtain from each instructor the class enrollment cards and present these and the withdrawal forms at the Registrar's office. (4) Obtain clearance from Registrar's office for any refunds which may be warranted. (5) Present processed withdrawal notice and Activity Card to the Cashier for refunds and/or for official, complete withdrawal.

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

Additions to Registration: An addition to the original registration can be effected on the official change-of-registration form. The approval of the teacher concerned and the student's adviser and Dean must be obtained and indicated by signatures on the change-of-registration form before the card will be accepted in the Registrar's office.

Change-of-Registration Fee: No charge for the first five school days after regular registration days. $1.00 for each class change made thereafter.

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

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

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

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

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

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

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

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

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

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

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

Request for permission to take special examinations should be made to the Registrar’s office.

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

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

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

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

**LOWER DIVISION**

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

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

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

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

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

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

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

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

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

   Students who already have a satisfactory knowledge of general biology, as demonstrated by examination, may satisfy this group requirement by taking Bacteriology 10 or 70 and 71 and Physiology 4.
2. Exact Science.
Chemistry—and course of Lower Division grade.
Geology—1 or 3, 4, 5, 8, 9, 10.
Geology 1 or 3, 4: Physical Science 31, 32, 33 (Complete sequences required for credit.)
Mathematics—any course of Lower Division grade.
Physics—any course of Lower Division grade.

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

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

 Majors in departments in the University College should see the introduction to the University College section of this catalog for suggested courses with which to fill group requirements.

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

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

UPPER DIVISION

Courses numbered from 100 to 199 are known as upper division courses.
Sixty credit hours of upper division work are required for graduation.

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

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

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

Special consideration is granted students who pursue prescribed Pre-medical, Pre-dental, Pre-veterinary, Pre-osteopathy, Pre-legal, and Child Development programs for three years at this University. 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 University. They need not comply with general major-minor requirements as previously outlined.

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

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

GRADUATION

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

IMPORTANT: The University 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 enter are held to the requirements, including entrance, of the class with which they graduate.

TERMINAL CERTIFICATE

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

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

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

In the College of Engineering and Technology, definite programs of study are prescribed leading to certificates of completion within definite fields.
GRADUATION REQUIREMENTS

of applied industrial work. These curricula may be found in the section entitled “College of Engineering and Technology.”

REQUIREMENTS FOR THE DEGREE OF
BACHELOR OF SCIENCE

The University confers the degree of Bachelor of Science upon students who meet the specified requirements of the various colleges as listed below:

College of Agriculture
College of Business and Social Sciences
College of Education
College of Engineering
College of Forest, Range, and Wildlife Management
College of Home and Family Living
University College

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

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

SUMMARY OF REQUIREMENTS FOR GRADUATION

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

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

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

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

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

4. Sixty credits of Upper Division work.

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

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

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

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

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

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

Grade points have been assigned to grades as follows: 4 grade points for each credit of “A,” 4 for each credit of “B,” 3 for each credit of “C,” 2 for each credit of “D,” and 1 for each credit of “F.” For graduation, a student must have twice 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 College in which the major work is done.

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

13. The candidate must have discharged all University fees.

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

REQUIREMENTS FOR HIGH SCHOOL TEACHER’S CERTIFICATE

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

STUDENT FEES

“The University reserves the right to alter any of these charges without notice.”

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STUDENT FEES

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Special Fees

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

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

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

Special Students—Registration fee $10.00

Plus $3.00 per credit hour (maximum 9 credits)

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

Qualifying Examination—Graduate School

1 Part ........................................ 5.00
2 parts ....................................... 6.00

Graduation Fee .................................. 10.00

Teacher Placement Fee .................................. 5.00

Teacher Placement re-registration .......................... 2.00

Locker Rental—Fall, Winter and Spring .................................. 1.50

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

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

Additional transcript (Extra copies .25) .................. 1.00

Progress Report. Adviser furnished one copy free.

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

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

Cap and Gown Rental—Bachelor of Science .................. 3.00
Master of Science ................................ 6.50

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

College of Business and Social Sciences—Students using business machines will be required to pay a fee of $2.00 per quarter.
College of Forest, Range, and Wildlife Management—

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

A minimum excess breakage fee of $5.00 may be required for Laboratory classes.

Military Uniform Deposit ........................................ 5.00
The above deposit is refundable upon presentation of clearance slip from department—accompanied by receipt showing that payment was made.

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

Music—Individual Instruction with members of the College staff:
- One lesson per week (10 lessons) per Quarter (1½ credits) $25.00
- Two lessons per week (20 lessons) per Quarter (3 credits) 50.00

Individual instruction with additional authorized teachers (as listed on page 154) is registered for at the college and given like credit, but paid for by private arrangement with the teacher concerned.

Practice Fees:
- Practice Room with Piano, 1 hour per day per Quarter ...$2.50
- Practice Room without Piano, 1 hour per day per Quarter... 1.75
- Organ, 1 hour per day per Quarter ................................ 5.00

Speech—The fee for Speech 12 and 112 is $20.00 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

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

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

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

STUDENT SERVICES AND ACTIVITIES

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

The administration and coordination of the entire program of student personnel services is the responsibility of the Dean of Students. Each of the various services is under the direction of student personnel specialists and qualified faculty members who have been carefully selected to consider each student in reference to his or her particular needs.

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

The Office of Student Personnel Services, Main Building, Room 133, invites inquiry from students on campus and prospective students and others off campus who wish to obtain information concerning out-of-class activities and other helpful assistance.

STUDENT ACTIVITIES

All students are encouraged to participate in one or more of the following activities, dependent upon available time and academic load:

1. Intercollegiate athletics.
2. Intramurals. This program includes all seasonal sports, for which awards are given.
3. Musicals. Performances are given by band, orchestra, choral groups, and music clubs. These organizations present several concerts and recitals during the year, and participate in tours to parts of the surrounding area.
4. Theartricals. Numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting.
5. Opera. Each year the University produces an opera. Such operas as "Rigoletto," "Faust," "Aida," and "II Trovatore" have been presented.
6. Debating and Public Speaking. The University is a member of the Rocky Mountain Forensic League, and each year meets schools of this group in discussion. Participation in debate tournaments in the Intermountain and Pacific Coast Region provides opportunity for experience in tournament debating. Utah State is noted for its Mid-Winter Speech Meet.
7. Student Publications. Students publish a semi-weekly paper, "Student Life"; a yearbook, "The Buzzer"; and a literary magazine, "Scribble"; "Blue Book," the official student handbook; and Student Directory, distributed to all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's "Juniper."
8. KVSC. The University operates an FM radio station which provides four hours of radio programs daily, prepared and broadcast by students. KVSC is a member of the National Association of Educational Broadcasters.
10. Dances and Entertainments. In addition to the above, the Student Body Organizations furnish extensive entertainment in the form of dancing, parties, and athletic events.
11. Assemblies. These are planned and produced by students to provide entertaining, spiritual and cultural programs.
12. Committees. Students are members of virtually every university committee. This includes not only Student Body committees, but also committees set up by the administration.
Associated Students. All students of Utah State University upon payment of student activity fees, become members and are therefore entitled to participate in and attend all activities sponsored by the association. Athletic events, musicals, dramas, dances, etc., are events to which members of USUAS are admitted by activity card.

The Executive Council consists of the five elected major officers of Associated Students; viz., president, first and second vice-presidents, secretary and business manager. The Council plays a major role in directing all student-conducted activities on campus.

The Student Senate is the legislative branch of student government and initiates policies for the welfare of the entire student body. Membership in the Student Senate includes: the Executive Council, the president of each of the four classes, a representative of each of the seven colleges, A. W. S. president, two representatives of independent students, and an international representative chosen by the foreign students on campus. There are three ex-officio members: president of Panhellenic, president of Inter-fraternity Council, and editor of Student Life.

Associated Women Students. Every woman student properly registered and enrolled in the University is a member of A. W. S. This organization fosters interest and participation in campus activities. It is governed by its own elected officers and board.


STUDENT ORGANIZATIONS

Departmental and Professional

Agriculture. Ag Club, Ag Economics Club, Agronomy Club, Alpha Tau Alpha, Alpha Zeta, Bacteriology Club, Block and Bridle Club, Botany Club, Dairy Club, Horticulture Club, Poultry Club, 4-H Club, Vet Science Club.

Business. Alpha Kappa Psi, STAT Club (Secretaries Today and Tomorrow).

Chemistry. American Chemical Society.

Education. Phi Delta Kappa, Utah State Education Association.


English. English Club.

Forestry. Forester's Club, Forestry Wives, Xi Sigma Pi.

Geology. Geology Club.

History. Phi Alpha Theta.

Home Economics. Home Economics Club, Phi Upsilon Omicron.

Landscape Architecture. Landscape Architecture Club.


Music. Alpha Eta Mu, Band, Chansonnets, Meistersingers, Orchestra, ROTC Band.

Physical Education. Badminton Club, Dance Club, PEMM Club (P. E. majors and minors), Ski Club, Square Dance Club, Swimming Club, Women's Intramural Association, Men's Intramural Association.

Political Science. International Relations Club, Pi Sigma Alpha.

Pre-Med. Alpha Epsilon Delta.

Psychology. Psychology Club.

Sociology. Sociology Club.
AWARDS AND HONORS

Speech. Tau Kappa Alpha, Theta Alpha Phi, Utah State University Speech Correction Association.
Zoology. Utah Zoology Club.

Social and Special Interest

Fraternities, Social. Kappa Sigma, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Sigma Pi.
Sororities, Social. Alpha Chi Omega, Chi Omega, Kappa Delta, Sigma Kappa.
Recognition and Honorary. Alpha Sigma Nu, Sigma Xi.
Regional. Bear Lake Club, Canadian Club, Sudags, Weber, Arab Student Organization.
Scholarship. Phi Kappa Phi, Alpha Lambda Delta.
Service. Blue Key, Intercollegiate Knights, Spurs, Sponsors.

SCHOLARSHIPS, AWARDS, AND HONORS

The University offers a variety of scholarships and awards. Some of these are actual money grants in varying amounts, others provide for registration and tuition fees to be waived. The latter kind generally come under the classification of tuition scholarships.

The primary purpose of the tuition scholarships is to assist new students who have high scholarship and financial need in becoming established in college. These scholarships are discussed in greater detail under the section on Scholarships and Grants-in-Aid.

Most of the Scholarships which consist of actual money grants are reserved for students who have been attending Utah State University for at least one year and preferably two years or more. These are usually given at the Awards and Honors Convocation which is held early in May of each year. Students who are interested in applying for scholarships and other awards may obtain information from the office of Student Personnel Services, Room 133, Main Building. Closing dates for receiving applications will be announced well in advance of such dates.

List of Awards and Honors
(Presented principally to students already enrolled)

The Johansen Scholarship Fund of $5,000, a gift of the late Mrs. Johana Johansen, provides scholarships annually, worth in the aggregate from $125 to $150, for help of worthy students of Junior and Senior rank.
The Lieutenant Clyde Parker Baugh Memorial Fund of $10,000, a gift Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership.
KSL Meritorious Scholarships, KSL awards two scholarships, one in Electrical Engineering and one in script writing or broadcasting.
The 1927 Class Gift to the College yields an annual income sufficient to provide two scholarships of $125 each. Application should be made by Juniors and must be accompanied by an approved outline of a proposed study project to be completed during the senior year. Two copies of the complete thesis are to be filed in the University library.
Rhodes Scholarships. Candidates for Rhodes Scholarships at Oxford University, England, are selected each year from Utah. High scholarship and some definite quality of distinction, whether in intellect, character, or personality, or in any combination of these, are the most important requirements. The
present value of the scholarship is £500. Seniors or graduate students are generally chosen as candidates. It is suggested, however, that students would do well to begin preparing for the candidacy in earlier years. Information and application blanks may be obtained from Dr. Sherwin Maeser, University representative, Rhodes Scholarship Committee.

**Institute of Radio Engineers Award.** This award is made each year to the outstanding senior Electrical Engineer and IRE student member. The award consists of one year's dues as associate member of IRE and a certificate of achievement.

**West Coast Electronic Manufacturers Association Scholarship Awards.** Several WCEMA awards of $200 each are made each year to Junior and/or sophomore Electrical Engineering students based on high scholarship and need.

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

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

**Louisa Y. Robinson National Woman's Relief Society Scholarship.** A gift of $5,000 from the General Board of the National Woman's Relief Society has established a perpetual fund, the annual earnings from which are available for Latter-day Saint women majoring in Social Work, or, as graduate students, majoring in Sociology with a special interest in the family or some field closely related to Social Work. The scholarship is in the amount of $100 for undergraduate students and $200 for graduate students. Undergraduate preference is given to Seniors, although Juniors are eligible, and are encouraged to apply. The scholarship is paid in full when the student completes her registration for the fall quarter. Application should include a transcript of credits, and two letters of recommendation, one of which must be from the Ward Relief Society President of the ward in which the student lives.

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

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

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

**Danforth Summer Fellowship.** Awarded to an outstanding Junior in Agriculture. This award covers the expenses of two weeks marketing study in St. Louis and vicinity and two weeks leadership training at the American Youth Foundation Camp on Lake Michigan.

**Danforth Leadership Training Scholarship.** An award to an outstanding Freshman covering the expenses of two weeks summer leadership training at the American Youth Foundation Leadership Training Camp on Lake Michigan. Transportation is up to the individual.

**Rollo M. Rich Memorial Scholarship.** An award of $50.00 to an outstanding student in agriculture in the upper division, who is active in the L.D.S. Church.

**Borden Agricultural Scholarship.** An award of $300.00 to a Senior in agriculture who has completed two or more courses in dairy industry and has achieved the highest average grade among students in agriculture in all college work preceding the Senior year.
Burpee Award in Horticulture. An annual award of $100.00 to the student in Horticulture who rates highest in scholarship, practical experience and interest in flower, vegetable and seed growing.

Ralston Purina Scholarship. An award of $500.00 given in recognition and assistance to an outstanding Junior in agriculture for use in his schooling the Senior year.

Virginia Dare Award. A cash award of $25.00 to the outstanding Junior in Dairy Manufacturing.

Swift and Company Award to a student in agriculture who is winner of an essay contest on livestock marketing. This award provides an expense paid trip of about one week to Chicago in early spring to study marketing of livestock and livestock products.

Sears-Roebuck Foundation Award for Sophomore. An award of $250.00 to the student in agriculture who, among the recipients of the Sears-Roebuck Award for Freshmen, had the highest grade point average the Freshman year. Available for school expenses for Sophomore year.

Sears-Roebuck Foundation Award for Junior. An award of recognition to the Sophomore who, among the recipients of the Sears-Roebuck Award for Freshmen, had the highest combined rating in scholarship, leadership and promise of achievement, evidenced by his university work during the Freshman and Sophomore years. The selection enters the student in a nationwide competition offering the following awards: One award of $1,000.00, three awards of $500.00 each, four awards of $250.00 each.

Farm Bureau Agricultural Leadership Award. An award of $200.00 to the Senior who has exhibited the greatest measure of growth and excellence in scholarship, constructive organization and leadership in the College of Agriculture throughout his university course. The winner's name will be engraved on the Caine Leadership Plaque.

Utah Feed Manufacturing & Dealers' Association Scholarship. An award of $100.00 to an outstanding Senior with a major in some phase of animal industry, preferably one interested in animal nutrition.

J. Fish Smith Scholarship. An award of $100.00 for the promotion of international relations, given to a foreign student in recognition of excellence in scholarship and contribution to international understanding and good will.

The American Rambouillet Sheep Breeders' Association Challenge Cup. To be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

The Ogden Union Stockyards Challenge Cup. Awarded each year to the student who shows the most proficiency in judging beef cattle.

The Hawaiian Steamship Company's Challenge Cup. Awarded each year to the student who shows the most proficiency in judging wool.

The Salt Lake Union Stockyards Company Challenge Cup. Awarded each year to the student who shows the most proficiency in judging hogs.

The John K. Madsen Challenge Cup. Awarded each year to the student who shows the greatest proficiency in judging sheep.

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

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

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

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

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

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

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

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

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

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

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

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

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

Herald-Journal Scholarship in Journalism. The Logan Herald-Journal annually presents a $50 scholarship at the beginning of the winter quarter to help some worthy journalism student continue at the university.

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

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

The American Legion Military Medal, a gift of the Logan American Legion Post, is awarded each year to the athletic letterman who maintains the highest scholastic record during the year, and who exhibits the most wholesome attitude toward 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 bases: (a) Character, 20 points; (b) Scholarship, 15 points; (c) University activity, 15 points; (d) Leadership, 20 points; (a) Aptitude for and interest in Military Science, 20 points; (f) Physique and bearing, 10 points.

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

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

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

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

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

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

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a "service plaque" to an outstanding Freshman or sophomore male student. Candidates are judged on university activities, scholarship, service to the university, 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.

John A. Widtsoe Memorial Scholarship. One graduate scholarship of $500 will be available to an outstanding senior to pursue graduate study; one scholarship of $200 will be given to an outstanding junior; and one scholarship of $200 will be presented to an outstanding freshman. All who receive scholarships must use the monies in university work the coming school year. Checks will be sent to them following registration in the fall term.

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

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

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

Scholarships and Grants-in-Aid

(Awards primarily for new students)

The University grants annually to students scholarships covering from one to three quarters' tuition each on the basis of outstanding academic ability or demonstrated academic ability and outstanding ability in the areas of speech, drama, music, art, athletics, commercial training, and other academic subjects. Tournament and contest winners frequently receive these awards.

The University also awards grants-in-aid to help deserving students with good academic ability who have economic need.

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

1. A freshman must have been academically rated as in the upper two-thirds of his high school graduating class. For the first year such award shall be made on an annual basis.
2. A student, other than a freshman, must be in good academic standing and not on probation. Such award shall be made on a quarterly basis.

All of the above awards are under the jurisdiction of a Scholarships and Grants-in-Aid Committee, which alone has the authority to promise or grant an award. All applications for grants-in-aid or scholarships should be made to the chairman of this committee.

All scholarships and grants-in-aid must be applied toward the payment of tuition or fees.

Any scholarship or grant-in-aid may be withdrawn at any time for academic or other good and sufficient reasons if, in the judgment of the Dean of students, the recipient has clearly demonstrated his failure to comply with both the spirit and the letter of the original terms of the scholarship or grant-in-aid.

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

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

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

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

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

Palmer Scholarships. Mr. and Mrs. Val. W. Palmer made a gift of $10,000 as a scholarship fund. Five scholarships of $200 each are awarded each year to students of outstanding scholarship and leadership ability.

Home Economics Scholarship. The faculty of the College of Home and Family Living awards one $100 scholarship to a high school graduate who shows special interest and ability in the field of home economics.

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

The following 4-H Club scholarships are available to Utah 4-H Club members. (Additional information may be obtained from county agents.)
Carl Raymond Gray Scholarships. The Union Pacific Railroad awards 16 scholarships annually to Juniors or Seniors in high school who are enrolled as 4-H Club members. These members scholarships are $100 each and are to be used at Utah State University or its branches. The scholarships are available in the following counties:

Beaver
Box Elder
Cache
Davis
Iron
Juab
Kane
Millard
Morgan
Rich
Salt Lake
Summit
Tooele
Utah
Washington
Weber

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

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

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

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

COUNSELING SERVICES

A broad program of counseling services has been designated to meet the needs of students in making and maintaining a satisfactory adjustment to the University. This program is coordinated under the supervision of the Coordinator of Counseling Services. The following services are included in this program: (1) counseling—educational, vocational, clinical, personal and marriage problems; (2) individual and group testing; (3) occupational and educational information; (4) assistance with study skills, and (5) training opportunities in counseling and testing for graduate students in Education, Psychology, and related fields; and (6) faculty advisement.

It is intended that each individual student enrolled in the University be given such assistance as may help him in making wise decisions in connection with his educational, vocational and personal problems. At the time of admission to the University, each student is assigned a faculty adviser with whom he will meet and have an opportunity to discuss his program. Those living in residence halls are invited to seek out their residence counselor who has key information to matters of registration, orientation, time management, study habits, campus regulations and requirements. In addition, students who wish the services of special counselors are invited to request such services through the office of the Coordinator of Counseling Services. Special counseling is provided in relation to speech and study skills, personal and social problems, emotional conflicts, courtship and marriage adjustment. Skilled counselors from the departments of Psychology, Sociology, Social Work, and Speech provide such help.

Guidance test data related to one's achievement, abilities, interests, and adjustment are also available upon request. Although certain basic tests are given to all new lower division students not having taken them while in high school, upper division students as well may avail themselves of this information. The data from these tests are used as a basis for counseling in educational, occupational and personal problems. Students who have not decided upon a course of study are especially encouraged to seek such information and assistance. Those who wish to change from one College of the University to another are required to have counseling before such a change may be made.
A comprehensive, current coverage of essential occupational information is maintained in the Office of Student Services. Current catalogs of the major universities and technical schools are also available. A close relationship with community and state agencies is maintained and students needing services not provided by the University will be referred to or be helped in securing such services.

**STUDENT EMPLOYMENT**

The Office of Student Employment Placement (Main 133) has been established to assist those students who are capable of carrying an academic load and need to supplement their regular income through part-time employment. Students’ wives are assisted also in obtaining positions.

All students and students’ wives desiring campus employment must register with this office and be appropriately cleared before being hired.

To extend off-campus services, the University has established a cooperative arrangement with the downtown office of the Logan Branch of the Utah State Employment Service. Requests for information on employment should be addressed to Chairman, Student Employment Placement.

Students from foreign countries must obtain a work permit before they can receive employment. Such permits may be acquired from the Foreign Student Advisor or the Immigration and Naturalization office in Salt Lake City, Utah.

Students under eighteen who find employment must obtain a work permit. These are controlled by the Logan City Board of Education. Further information is available in the Office of Student Employment Placement.

**STUDENT HEALTH SERVICE**

**Regulations and requirements:**

1. Physical examinations are required of all new students and of all who participate in athletic and physical education activities.

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

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

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

5. Office Hours:
   - 8 a.m. to 5 p.m. daily.
   - 10 a.m. to 12 noon Saturday.

The following medical service is available to all registered students without cost:

**I. Regular dispensary care.**

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

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

**II. These services are intended to cover the resident student while on the campus between the hours of 8 a.m. and 5 p.m., and students off the campus in a school supervised activity.**
Governor George D. Clyde Signs Bill Changing Name to Utah State University
III. Does not include:
1. Emergencies occurring off the campus.
2. Emergencies occurring out of town.
3. Chronic illness originating before entrance to school.
4. Hospital care for any condition.
5. Major surgery.
6. Service to wives or children of students.

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

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

VI. In case of illness or emergency, call:
1. U. S. U. Student Health Services, Telephone 100, Ex. 51.

STUDENT HOUSING
(Costs subject to revision)

Residents must be regularly enrolled students at Utah State University.

Supervised Living Accommodations for Single Women

All freshmen women not living at home are required to live in University supervised housing.

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

Lund Hall is a fire-proof, air-conditioned residence hall for 100 women. Linen changes, bedding, and desk lamps are furnished. Towels and other personal effects are not furnished. An average cost of $189.00 per quarter covers board and room charges. Twenty meals per week are provided.

Co-operative Houses on campus provide for excellent group living experience for 20 upper-class students who share living expenses and housework. An average cost for rent including heat and water is $42.00 per person per quarter. Other utilities are not provided.

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

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

Supervised Living Accommodations for Single Men

Kerr Hall, located at 250 West Center, has facilities for 40 men. A local bus line gives direct service to the Campus. All items except towels and per-
sonal effects are furnished. Two meals per day, except one on Sunday, are provided. Average board and room rate is $148.00 per quarter.

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

Living Accommodations for Married Students

University Apartments, (Prefabricated Units) 278 in number, located on the east fringe of the campus are within easy walking distance of the Campus proper. They are combination living-room-kitchen-study arrangements with bedroom, bathroom and clothes closets. These units can be rented furnished, unfurnished, or partly furnished with rent ranging from $27.50 to $32 per month. Electricity, cooking utensils, bedding, electric refrigerators, washing machines, dishes, window curtains, and other personal effects are not furnished. Apartments are provided with centralized hot air space heat, and an electric rangette for cooking. A central laundry room is available to each set of 28 apartments.

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

University Trailer Court, located on the corner of 12th East and 7th North, three blocks east of the campus proper, provide 24 modern trailer connections to sewer and water mains. Parking space is hard surfaced. A utility house provides laundry space, also rest rooms and individual shower stalls. The University will provide coin metered clothes washing machines and dryers. Permission to use privately owned clothes washing and drying equipment in the utility houses will not be granted except in the cases of tenants continuing tenancy who already have their equipment in use. In these exceptional cases permission is granted until June 30, 1958, only, after which all privately owned equipment shall be removed from the utility houses. Monthly space rental per trailer house is $12.50.

Off-Campus Housing

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

Application for Housing

Prospective students are invited to direct their applications and inquiries to Coordinator of Student Housing, Utah State University, Logan Utah. A $10.00 application fee is required when applying for University owned housing. Students desiring off-campus housing may procure the current housing list upon arrival at the University, Room 138, Main Building.

Food Services

Food service is obtainable in the University Cafeteria located in the Student Union Building on campus. Monday through Friday schedules and approximate costs run, Breakfast 7:30-8:15 a.m., 40c-55c; Lunch, 11:30 a.m.-1:00 p.m., 50c-75c; Dinner 5:30 p.m.-6:30 p.m., 60c-85c. Saturdays and Sundays, Break-
fast 9:00-9:30 a.m., Lunch 12:00 p.m.-1:00 p.m. The snack bar operates 8:00 a.m.-10:00 p.m., Mondays through Fridays and 12:00 m.-11:30 p.m. Saturdays.

Regulations and Procedures

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

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

FOREIGN STUDENT ADVISER

Students from outside the United States are provided a friendly and sympathetic counselor in the person of Dr. George A. Meyer, Foreign Student Adviser, Room 124, Main Building. He advises with all students from abroad concerning problems of adjustment to University life and refers them to the appropriate agencies and individuals on campus and elsewhere for further assistance.

Foreign students will obtain additional help from the Registrar’s Office in matters of acceptance and admissions, registration, withdrawals, reports to the Immigration Service and “extensions of stay” in the United States.

All students from abroad are invited to participate in activities sponsored by the Cosmopolitan Club. This organization has a membership of students and townspeople from America and foreign lands and promotes numerous activities fostering international friendships.

SPEECH CLINIC

The Speech Clinic provides individual help and special classes for persons having speech handicaps. In addition to the speech and hearing examination required of all new students, improvement training is available to anyone. The types of problems handled include stuttering, delayed speech development in children, baby talk, lisping and other articulation disorders, cleft palate speech, paralytic speech, “nervous” speech conditions, nasal speech, voice quality deviations, etc. All University students who have defective speech should register for Speech 75, Remedial Speech. Time and credit are arranged. The instructor is available for individual consultation, Room M 79.

STUDENT LOANS

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

Except in cases of extreme emergency no loans will be made during the last two weeks of any quarter.

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

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

U. S. U. Faculty Women’s League. A loan fund for women students. Loans may range from $50 to $150. Preference is given Seniors.
U. S. U. Faculty Women's League Revolving Loan Fund provides for short time loans, not to exceed $20, to women students for emergency purposes. Senior Loan Fund, a gift of the class of 1911, and added to by the class of 1922, has helped many students complete school. Rotary Club Senior Loan Fund. The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year. Robert L. Judd Loan Fund was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and need financial assistance. W. B. Rice Memorial Loan Fund provides loans up to $200.00, usually for one year, to deserving students in the School of Forest, Range and Wildlife Management. Application is made to the Dean's office. Bureau of Land Management Loan Fund provides loans up to $100.00 to deserving students in the College of Forest, Range, and Wildlife Management. Application should be made to the Dean's office. Marjorie Poulson Loan Fund. A fund provided by the father of a former Aggie student active in student body affairs. Ichel Waters Loan Fund. An individual gift to assist students in need. J. Reuben Clark Small Loan Fund. A reserve specifically provided for assistance to students in meeting school obligations. O. W. Israelsen Loan Fund available to senior engineering students only. Application is made in the College of Engineering and Technology. College of Forestry has a small loan fund for students enrolled in that college.

ORIENTATION

A program of activities designed to acquaint students with the life and environment of the University community. New students at the beginning of each quarter are required to attend group meetings and other activities wherein they are provided with entertainment and instruction to aid them in becoming oriented to campus atmosphere, traditions, policies, and procedures. At the beginning of each academic quarter each new student in the University who has less than 96 quarter credit hours, is required to take certain standardized tests unless such tests have been taken at the school last attended. The results are used by faculty and counselors to assist in placement and as guidance aids. For example, recorded credit for first courses taken in Basic Communications is dependent upon information concerning such test scores as a part of the student's record.

RELIGION

The officers of Utah State University are deeply interested in the spiritual and moral growth of all students. Every student is encouraged to affiliate with the church of his choice immediately upon registering at the institution. Outstanding religious leaders of the Latter-day Saint, Protestant and Catholic faiths cooperate with the University in serving the students of their respective churches. Accredited courses in religion are also offered by scholars representing each of these groups. An L. D. S. Institute, with a staff of five well-trained instructors and an enrollment of more than 1500 students, is adjacent to the campus. The other churches are used by the various leaders.
SCHOOL OF GRADUATE STUDIES
Graduate study is supervised by the Dean of the School of Graduate Studies, assisted by the Graduate Council. This council consists of one representative from each of the seven schools of the university, and the Libraries. Members of the Council are nominated by the Faculty Senate and appointed by the president to serve four-year terms. Two to be appointed each year.

The present Graduate Council is constituted as follows:
- College of Agriculture—Professor Leonard H. Pollard
- College of Business and Social Sciences—Professor Evan B. Murray
- College of Education—Professor Arden Frandsen
- College of Engineering—Professor Cleve Milligan
- College of Forest, Range and Wildlife Management—Professor Laurence A. Stoddart
- College of Home and Family Living—Professor Ethelwyn B. Wilcox
- University College—Professor Eldon J. Gardner
- Libraries—Professor Milton Abrams

ADMISSION TO GRADUATE SCHOOL

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

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

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

MASTER OF SCIENCE DEGREE

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

Qualifying Examinations: A qualifying examination is required by the Graduate School and may be taken prior to registration. If not taken, this examination and any qualifying examination required by the student's department must be taken as soon as possible after registration. The results of these examinations become a part of the student's file in the graduate office. If a student is found to be deficient in the work basic to the field in which he proposes to study, he may be required to take undergraduate courses, which do not count in the minimum requirements for the Master's degree, to satisfy the deficiency.
Supervisory Committee: When it has been determined that a student is acceptable as a possible candidate for a higher degree, the major professor will suggest a committee to assist in guiding the student's program and in conducting necessary additional qualifying examinations and the final examination. When the student's program has been determined and approved by his committee, he will be advanced to candidacy for a degree. Advancement to candidacy must be accomplished before the end of the winter quarter if the student is to graduate at the following Commencement. When the student's research is best supervised by a federal collaborator, or other person who is not a member of the regular teaching staff, such collaborator or other person may be designated as thesis director. This thesis director is a member of the student's committee.

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

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

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

Microfilming of Thesis: The student is required to pay for the microfilming of his thesis, the films being deposited in the college library. For master's candidates, the fee is five cents per page and the student may obtain his own positive copy for a small additional charge. For doctor's candidates the fee is $20.00 and the film is produced by and registered with University Micro-films, Ann Arbor, Michigan.

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

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

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

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

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

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

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

### MASTER OF EDUCATION DEGREE

The Master of Education degree is granted in each of the following areas:
- Master of Education in School Administration and Supervision
- Master of Education in Secondary Education
- Master of Education in Elementary Education
- Master of Education in Vocational Education

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

The requirements for the Master of Education degree include:
1. At least 45 credits beyond the bachelor's degree subject to the same limitations of off-campus course credit, transfer credit and time limit as the Master of Science degree.
2. A graduate minor of at least 10 credits in a field other than education.
3. Specified courses in each of four areas of the field of education.
4. Possession of a teaching, administrative, supervisory or other appropriate state school certificate.
5. At least 3 years of successful teaching or administrative experience.

### MASTER OF FORESTRY DEGREE

The master of forestry degree is given upon completion of a course of study prescribed by the department of forest management within the general requirements of the School of Graduate Studies. It is designed for those who have a Bachelor's degree in some field other than forestry and who wish to earn a degree in forestry. It normally requires from two to three years depending upon how closely the candidate's original field is related to forestry.

### DEGREE OF CIVIL ENGINEERING AND IRRIGATION ENGINEERING

The School of Engineering and Technology offers a two-year graduate program in Civil Engineering and Irrigation Engineering leading to the degrees of Civil Engineer and Irrigation Engineer. The plan of study for those degrees is similar in many respects to plans at other western institutions for degrees of Civil Engineer, Mechanical Engineer, etc.
Special Requirements: The student program for these degrees include:
1. A minimum of 6 quarters of study, of which at least 3 quarters must be in residence at Utah State University.
2. Completion of 90 credits of approved courses.
3. Completion of a minimum of 30 credits of graduate courses (200 series), exclusive of thesis.
4. Completion of an adequate thesis based on a research program for which a maximum of 30 credits may be allowed by the committee.

For candidates who present the Master of Science degree in an appropriate field of engineering, and who have completed a thesis project for this degree, the requirements will be modified as follows:
1. A minimum of 3 quarters in residence.
2. Completion of a suitable program of study of not less than 45 credits, of which
   (a) at least 30 credits must be graduate courses (200 series), and which
   (b) a maximum of 20 credits for thesis.

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

DOCTOR OF EDUCATION DEGREE

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

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

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

DOCTOR OF PHILOSOPHY DEGREE

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

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

Student Program: The student program for the Doctor of Philosophy degree must include:
1. Three years of full-time graduate study above the Bachelor's degree. If the student has a Master's degree, then two years will be required. The student's supervisory committee may recommend that part of this program be taken at other schools, but the last year must be spent in residence at Utah State University;
2. A minimum of 135 credits of approved graduate study beyond the Bachelor's degree, 90 credits beyond the Master's degree;
3. A major field to which approximately two-thirds of the time is devoted. The minor may be divided between two suitably related areas. A Master's degree in a suitably related area may satisfy the minor requirement.
4. A research problem on which a thesis will be presented. Credits for this thesis may not exceed 45, and work on the thesis should ordinarily occupy most of the third year, but may be carried on with course work throughout the program.
Language Requirement: A reading knowledge of at least one foreign language is required of all candidates. The particular language required will be that which meets best the applicant's needs. Requirement of a second language will be optional with the department in which the student is taking his major. The degree of proficiency of the applicant to use the required language in his chosen field and his knowledge of the grammar and structure of the language will be determined by a committee appointed by the Dean of the Graduate School from members of the language department.

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

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

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

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

Majors Offered: The doctor of philosophy degree is offered in: animal husbandry, agronomy, biochemistry and nutrition, botany, entomology, horticulture, irrigation and drainage engineering, range management, sociology, wildlife management, and zoology.

INTERDEPARTMENTAL CURRICULUM IN NUTRITION AND BIOCHEMISTRY

Faculty

Professor Delbert A. Greenwood, biochemistry and pharmacology; Associate Professor Harris O. Van Orden, biochemistry; Professor Lorin E. Harris, animal nutrition; Assistant Professor John E. Butcher, animal nutrition; Assistant Professor Joseph C. Street, animal nutrition; Professor George E. Stoddard, dairy nutrition; Professor Carroll I. Draper, poultry nutrition; Associate Professor Jay O. Anderson, poultry nutrition; Professor Ethelwyn B. Wilcox, human nutrition.

General

All the resources of the university related to work in this area are made available to the staff members and students engaged in research in biochemistry and nutrition. These include the metabolism laboratory with unique facilities for conducting simultaneous digestion and metabolism studies on numerous large animals; an electron microscope, spectrograph, ultracentrifuge, Tiselius apparatus and gas chromatographic equipment. Major problems being studied are affects of toxic and non-toxic substances on digestion and metabolism of farm animals, atmospheric pollution, nutritional status of population groups, and basic physiological processes related to nutrition. Fellowships with stipends from $1200 to $4800 are available.

Students are prepared for research in educational institutions, governmental and industrial laboratories, or for college teaching.

Curriculum

Prerequisites for a major in this area will include one year or equivalent training in English, general chemistry (including qualitative analysis,
analytical, organic chemistry), mathematics through integration calculus, and Physics. Basic courses in bacteriology, botany, physiology, and zoology are required. Appropriate minors are mathematics and statistics, chemistry, physics, physiology, genetics, and other fields closely related to the major. All students will be expected to attend and participate in the area seminar.

**Master's Degree**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One year biochemistry</td>
<td>12</td>
</tr>
<tr>
<td>2. One year nutrition</td>
<td>12</td>
</tr>
<tr>
<td>3. Statistics and animal diseases</td>
<td>12</td>
</tr>
<tr>
<td>4. Elective and research</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
</tr>
</tbody>
</table>

**Doctor's Degree**

The following in addition to the master's degree curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. One year advanced nutrition</td>
<td>15</td>
</tr>
<tr>
<td>2. Advanced biochemistry</td>
<td>15</td>
</tr>
<tr>
<td>3. Advanced chemistry, statistics, mathematics or physics</td>
<td>10</td>
</tr>
<tr>
<td>4. Advanced zoology—(genetics, physiology, histology)</td>
<td>15</td>
</tr>
<tr>
<td>5. Advanced bacteriology, anatomy, and pathology</td>
<td>10</td>
</tr>
<tr>
<td>6. Electives and thesis</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
</tr>
</tbody>
</table>

**Area Committee**

The curriculum is supervised by a committee consisting of Professor Greenwood, Chairman; Professors: Harris, Anderson, Stoddard, Greenwood, Van Orden, Wilcox, and Professor James Bennett. Chairmanship rotates.

**TEACHING AND RESEARCH ASSISTANTSHIPS**

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

**TUITION SCHOLARSHIPS**

A number of tuition scholarships are available to beginning graduate students who are residents of the State of Utah. Applications should be made to the dean, School of Graduate Studies.
<table>
<thead>
<tr>
<th>Department</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Agriculture</td>
<td>79</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>81</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>83</td>
</tr>
<tr>
<td>Agronomy</td>
<td>85</td>
</tr>
<tr>
<td>Animal Husbandry</td>
<td>89</td>
</tr>
<tr>
<td>Applied Statistics</td>
<td>92</td>
</tr>
<tr>
<td>Botany and Plant Pathology</td>
<td>93</td>
</tr>
<tr>
<td>Dairy Industry</td>
<td>94</td>
</tr>
<tr>
<td>Horticulture</td>
<td>97</td>
</tr>
<tr>
<td>Poultry Husbandry</td>
<td>100</td>
</tr>
<tr>
<td>Veterinary Science</td>
<td>102</td>
</tr>
<tr>
<td>Agricultural Experiment Station</td>
<td>103</td>
</tr>
<tr>
<td>Cooperative Extension Service</td>
<td>105</td>
</tr>
</tbody>
</table>
The best trained person receives the best employment opportunities in agriculture as in other occupations. Opportunities in crop and livestock production, marketing, extension work, teaching, research, positions in agriculture in the foreign service, and in various businesses related to agriculture await students who have adequate technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest and disease control methods are needed to rehabilitate under-developed territories. Increase of soil fertility by prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution. Thus a great opportunity and a challenge await students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

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

The new Agricultural Science Building was erected recently on the campus to house the administrative officers of the College of Agriculture, the Agricultural Experiment Station, and the Cooperative Extension Service. The departments of Applied Statistics, Agriculture Economics, Agronomy, and Horticulture are also housed in this building where modern class rooms and well-equipped laboratory facilities are available for teaching and research.

The University barns and livestock have been moved from the campus to the Animal Husbandry Farm located approximately one-half mile north of the campus. New housing facilities are available for housing of livestock and for special phases of animal research work. These facilities include a new building with modern equipment for the study of animal metabolism, physiology, and nutrition.

The Dairy Farm is located one mile North of the campus. Here the most modern facilities and equipment for housing dairy cattle and for research in dairy cattle management, nutrition and breeding have been constructed. A modern milking parlor is a part of these facilities and milk is handled by the most modern and up-to-date methods. Milk is transported from the dairy farm to the processing plant on the campus by a large refrigerated tank truck.

The University Poultry Farm is north of the campus adjacent to the Dairy Farm. The poultry plant is well equipped for student instruction and research work in poultry husbandry. Extensive investigations are under way for the study of the best methods of feeding, housing, and disease control to obtain the most economical production. The Turkey Farm is located approximately one mile north and east of the campus. Research in turkey breeding and management is conducted at this farm.

The Veterinary Science Building offers headquarters for teaching and research in animal physiology, hygiene, and animal disease research. Well equipped laboratories, isolation rooms, and facilities for keeping livestock and poultry for study and research are available. A veterinary clinic is maintained for diagnostic service for livestock and poultry producers.

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

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

 CURRICULA IN AGRICULTURE

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

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

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

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

 GENERAL AGRICULTURE

1. General Agriculture. A course to assist freshmen in their adjustment to college life and acquaint them with what is offered in the fields of agriculture. Required of freshmen in agriculture. (1F)

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

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

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

(a) Minimum Requirements in Following Divisions:

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

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

<table>
<thead>
<tr>
<th>Field</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Science</td>
<td></td>
</tr>
<tr>
<td>Math. 34 or 35</td>
<td>3 or 5</td>
</tr>
<tr>
<td>Chem. 10, 11 &amp; 12 or 3, 4 &amp; 5</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18 or 20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td></td>
</tr>
<tr>
<td>Botany 24 or 25</td>
<td>5</td>
</tr>
<tr>
<td>Bacteriology 10 or 70 &amp; 71</td>
<td>5</td>
</tr>
<tr>
<td>Zoology 3 &amp; 4</td>
<td>5 or 10</td>
</tr>
<tr>
<td>Zoology 112</td>
<td>5</td>
</tr>
<tr>
<td>Entomology 108</td>
<td>5</td>
</tr>
<tr>
<td>Botany 130</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Science</td>
<td></td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>5</td>
</tr>
<tr>
<td>Other social science courses</td>
<td>5</td>
</tr>
<tr>
<td>(See University group requirements)</td>
<td>10</td>
</tr>
</tbody>
</table>

*Courses to be selected from agronomy and horticulture.
**Courses to be selected from animal husbandry, dairy industry, poultry husbandry, and veterinary science.
Soils 56 or 66 is required as part of the 26 credits.
<table>
<thead>
<tr>
<th>Course Type</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Communications 1, 2, 3</td>
<td>9</td>
</tr>
<tr>
<td>University group requirement</td>
<td>8</td>
</tr>
<tr>
<td>(See University group requirements)</td>
<td>17</td>
</tr>
<tr>
<td>Military Science or Physical Education</td>
<td>6</td>
</tr>
<tr>
<td>Total credits prescribed</td>
<td>151</td>
</tr>
<tr>
<td>Elective</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>186</td>
</tr>
</tbody>
</table>

**SPECIALIZED AGRICULTURE**

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

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

He must also complete the following:

- Mathematics 34 or 35
- Chemistry 10, 11 & 12 or 3, 4 & 5
- (Majors in agricultural economics may substitute Physical Science 31 and 32 and another 5 hours of exact science for 15 hours of chemistry)

A minimum of 14 credits in the following courses:

- Botany 24 and 25
- Zoology 3 and 4
- Bacteriology 10 or 70, 71
- Zoology or Botany 1
- Physiology 4

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

Agricultural Econ. 53, 5 credits; and two additional 3-credit courses

Social science group, 8 credits
Language and arts group, 8 credits
Basic Communications, 9 credits
Agron. 56

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

**TECHNICAL COURSES**

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

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

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

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

The following courses are open to students in the non-degree course in Agriculture: Agricultural Economics 53, 58, 63, 70; Agricultural Engineering 1, 14, 15; Agronomy 7, 8, 56; Animal Husbandry 1, 10, 15; Dairy Husbandry 2, 6, 7; Horticulture 1, 2, 4, 5, 10; Irrigation and Drainage 10; Landscape Architecture 3; Poultry Husbandry 1, 2, 8; Veterinary Science 20.

Students in the two-year course must complete 96 credits to obtain a certificate.

AGRICULTURAL ECONOMICS


W. P. Thomas, Professor Emeritus.

Agricultural Economics is a study of economic or business principles and problems involved in producing and marketing agricultural products. A well trained Agricultural Economist is familiar with major scientific principles and practices of crop and livestock production and with principles of economics and business practices. A wide range of employment opportunities is available to capable men and women with such training. Opportunities include the operation of one's own farm, professional farm manager, teaching, research or extension work at either state or federal level, foreign service, and as owner-operator or employee of any business that buys, sells, or processes agricultural products or provides supplies or services for agriculture.

This department offers work for the B.S. and the M.S. degrees as well as service courses for majors in other departments in Agriculture and in several other colleges.

Bachelor of Science Degree. Candidates for the B.S. degree must meet the University group and other requirements and the requirements of the College of Agriculture. Required and other suggested classes are listed below. Equivalent and substitute classes are accepted for transfer students.

Master of Science Degree. Facilities of the department for training graduate students in general agricultural economics, farm management, land economics, agricultural finance, marketing, and prices are augmented by the research investigations conducted by the department staff and the federal collaborator with the assistance of graduate students. The following courses in Agricultural Economics may be used for graduate credit: 102, 105, 106, 112, 116, 121, 155, 163, 180.

Agricultural Economics 53 or its equivalent is prerequisite to all other courses in Agricultural Economics.
Suggested Course of Study for the B.S. Degree in Agricultural Economics

Exact Sciences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 34</td>
<td>3</td>
</tr>
<tr>
<td>Math. 35</td>
<td>5</td>
</tr>
<tr>
<td>Chem. 10, 11 and 12 or</td>
<td></td>
</tr>
<tr>
<td>Phys. Sci. 31, 32, 33 and</td>
<td></td>
</tr>
<tr>
<td>5 hrs. in another exact science</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
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</table>

Biological Sciences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zool. 1, Bot. 1 or Bact. 1</td>
<td>5</td>
</tr>
<tr>
<td>Bact. 10, Bot. 24 or Zool. 3</td>
<td>5</td>
</tr>
<tr>
<td>Physiology 4</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
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</tbody>
</table>

Social Sciences (Excl. Econ.):

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociology 10</td>
<td>5</td>
</tr>
<tr>
<td>Pol. Science 10</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
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<tr>
<td>Total</td>
<td>15</td>
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Languages and Arts:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech 1</td>
<td>5</td>
</tr>
<tr>
<td>English 40 or 41</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
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</tbody>
</table>

Basic Communications     9

Military Science or Physical Education     6

Economics:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Economics 52</td>
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</tr>
<tr>
<td>Economics 107</td>
<td>3</td>
</tr>
<tr>
<td>Economics 108</td>
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<tr>
<td>Economics 155</td>
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<tr>
<td>Other</td>
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<td>Total</td>
<td>20*</td>
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* A minimum of 15 credits required

Business Administration:

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<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Accounting 109</td>
<td>4</td>
</tr>
<tr>
<td>Management 147, 148</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>10*</td>
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</table>

* A minimum of 6 credits required

Applied Plant Science and Soils:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Agronomy 56</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>15*</td>
</tr>
</tbody>
</table>

* A minimum of 10 credits required

Applied Animal Sciences:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>An. Hus. 10</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>15*</td>
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</tbody>
</table>

* A minimum of 10 credits required

Agricultural Engineering:

<table>
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<tr>
<th>Course</th>
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<tr>
<td>Ag. Eng. 10 or 110</td>
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<td>Ag. Eng. 15</td>
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<td>Ag. Eng. 101</td>
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Statistics:

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<tr>
<td>Appl. Stat. 131</td>
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Major:

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<tr>
<td>Ag. Econ. 53, 58, 62, 102, 105, 106, 112, 121, 155, 163, 180</td>
<td>35</td>
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</table>

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

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

62. Principles of Marketing. Organization of the marketing system including functions, institutions, policies and practices. (5W) Lamborn

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

70. Farm Accounts. Farm accounts and their application to the organization and management of farms and to filing of income tax statements. (3W) Roberts
102. **Intermediate Farm Management.** Principles and practices associated with the successful operation of farms. Emphasis will be placed on the principles underlying the production and financing functions. (3W) Roberts

105. **Agricultural Credit.** Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. Taught alternate years. Not taught 1957-58. 3 credits Morrison

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

112. **Agricultural Cooperatives.** Principles of cooperation; organization, operation and management of cooperative sales, purchasing, and service associations. (3S) Christensen

116. **Livestock Marketing.** Principles and practices of marketing as applied to livestock and products of the meat packing industry. (3F) Anderson

121. **Statistical Methods.** Mathematics and statistics applied to the analysis of Agricultural Economics data. (5S) Strong

150. **Special Readings.** Directed readings on selected problems for undergraduates. Any quarter. Time and credit arranged. Staff

155. **Law on the Farm.** A non-technical consideration of some legal rights, responsibilities and liabilities associated with the operation of a farming business. (3F) Morrison

163. **Intermediate Marketing.** Principles and functions of marketing and their application to the marketing of agricultural products. (3F) Anderson

180. **Government and Agriculture.** A study of government in relation to selected economic problems, past and present, in agriculture. Emphasis will be on the problems, the objectives of government action, the alternative proposals for action, action taken, and the results so far as they can be interpreted. (3W) Blanch

202. **Advanced Farm Management.** Economic principles and their application to specific production functions in agriculture. (5S) Morrison

206. **Farm Appraisal.** Principles and techniques of land valuation and appraisal. (2W) Blanch

214. **Thesis.** Any quarter. Time and credit arranged. Staff

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

240. **Research Methods.** Methods and techniques of doing research in Agricultural Economics (3F) Blanch

250. **Special Problems.** Directed study on selected problems for graduates. Any quarter. Time and credit arranged. Staff

263. **Advanced Marketing.** Economic principles applied to the solution of agricultural marketing problems. (5W) Lamborn

280. **Agricultural Policies.** Application of economic principles and methods of analysis to the formulation and appraisal of agricultural policies and programs. (5F) Blanch

**AGRICULTURAL EDUCATION**

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

Students preparing to teach vocational agriculture register in the Department of Agricultural Education. In the curriculum planned for training teachers of vocational agriculture, emphasis is given to practical farm experience, a broad background in the major fields of human knowledge, general training in agriculture, and a program of teacher training for youth and adults in the vocation of farming. This curriculum meets minimum requirements for the general secondary and vocational agriculture certificates as set forth by the Utah State Board of Education. Counseling service is available to assist students in selecting courses throughout the four years of College work.
Opportunity is offered for research and graduate study in Agricultural Education through any major department in the College of Agriculture. Students planning to do graduate work should select a co-ordinated program of study in the Colleges of Agriculture and Education.

Prescribed Course for Majors in Agricultural Education

Institutional and General Requirements

<table>
<thead>
<tr>
<th>Biological Science</th>
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<tbody>
<tr>
<td>*Botany 24</td>
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<tr>
<td>*Zoology 3</td>
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<tr>
<td>Zoology 112 (Genetics)</td>
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<tr>
<td>*Bacteriology 10</td>
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<td>or 70 &amp; 71</td>
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<tr>
<td>*Landscape Architecture</td>
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<tr>
<td>*Speech, or Music, or</td>
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<td>*Art or Literature</td>
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<th>English</th>
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Basic and Minimum Requirements in Agriculture, Agricultural Engineering, and Education

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<th>Animal Industry‡</th>
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<th>Plant Industry‡</th>
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<tbody>
<tr>
<td>Agron. 56 (Soils)</td>
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<tr>
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<table>
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<th>Agricultural Engineering*</th>
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| Total                              | 84       |

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<th>Social Sciences</th>
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<tr>
<td>*Agr. Econ. 53</td>
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<td>*Sociology 10 or 70 or</td>
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<td>*Political Science 10 or</td>
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<td>*History 14</td>
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<td>*Mathematics 34</td>
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<td>Radio 21, Physics 3 or 6</td>
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<tr>
<td>or 7, Geology 3</td>
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<th>Education</th>
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<tr>
<td>Psychology 102</td>
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<tr>
<td>Public Health 155</td>
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<tr>
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<table>
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<tr>
<th>Total Minimum Requirements</th>
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<tr>
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<tr>
<td>Institutional and General</td>
<td>69</td>
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<tr>
<td>Agriculture</td>
<td>80</td>
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<tr>
<td>Education</td>
<td>33</td>
</tr>
<tr>
<td>Military Science &amp; P.E.</td>
<td>6</td>
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</table>

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

Courses


124. Methods of Teaching Farm Mechanics. Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (3F) Richardson
125. Methods of Teaching Agriculture. Fundamental principles and practices of all teaching. Special attention is given to selection, organization, and teaching of subject matter and supervision of agricultural activities on the farm. (5W-S) Richardson

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

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

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

225. Special Problems in Agricultural Education. A consideration of needs of the individual. Upper division and graduate students and special types of service. One credit.

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

AGRONOMY


Bachelor of Science Degree in Agronomy

Study and research in Agronomy focus upon problems of crop production and soil conservation in arid regions. Course offerings emphasize interrelations of plants, soil, precipitation, and irrigation water in production of maximum crop yields under a variety of conditions. Four types of majors for the bachelor's degree are offered within the department.

Crop Science

Students majoring in Crops Science are prepared for positions in the Agricultural Extension Service; as agronomists, farm planners, conservationists, and soil scientists in the United States Civil Service; and as field men or farm managers in the commercial field.

In addition to the general University group requirements, majors in Crop Science should take: Agron. (Crops) 7, 8, 103, 109, 112, 118, 120; Agron. (Soils) 56, 107, 111, 114, 155; Ag. Econ. 63 and two 3 credit classes. Ag. Eng. 10 or 110; Animal Science 6 hours (3 hrs. in each of 2 departments); Bact. 10; Bot. 24, 25 and 120 or 130; Chem. 10, 11 and 12; Ent. 108; Geol. 3; Hort. 3 hrs.; Math. 35 and 44; Zool. 112.

Technical Crops

Students majoring in Technical Crops are prepared to do graduate work or to take technical employment in research and teaching in crop production, plant breeding, weed control, and seed technology. Those students
having special aptitude in the fundamental sciences and who are interested in plant sciences, will find unlimited opportunity in this field.

In addition to the general University group requirements, majors in Technical Crops should take: Agron. (Crops) 7, 8, 103, 109, 112, 113, and 120; Agron. (Soils) 56, 107, and 155 or 165; Ag. Ec. 53; Ag. Eng. 10 or 110; Animal Science 3 hrs., Appl. Stat. 131 and 132; Bact. 10; Bot. 24, 25, 120, and 130 (recommend 90 and/or 108); Chem. 10, 11, 12 and 190; Ent. 108; Geol. 3; Hort. 3 hrs.; Math. 35 and 46 (recommend also 97, 98, and 99); Zool. 112.

**Soil Science**

A major in Soil Science prepares the student for employment as a specialist in the Soil Conservation Service, the Soil Conservation Division of the Indian Service, soil surveyors, soil scientists in the Bureau of Reclamation, extension specialists, farm managers, as well as other positions related to reclamation and conservation of soil and water resources.

In addition to the general University group requirements, majors in Soil Science should take: Agron. (Crops) 7, 8, 103, 112, 118; Agron. (Soils) 56, 107, 111, 114, and 155 or 165; Ag. Ec. 53, and two-3 credit classes; Applied Animal Sciences, two 3 hr. classes (in two depts.) Bact. 10; Bot. 24, 25, 120; Chem. 10, 11, 5 or 3, 4, 5, and Chern. 17 & 18 or 115; Ent. 108 or Bot. 130; Geol. 3, Hort. 1 or 4; Math. 35 and 46* Phys. 10 hrs.; A. E. 10, or 110 Eng. Draw 60. A total of 63 hrs. in mathematics, physics and chemistry. These requirements meet the minimum approved by the Soil Science Society of America.

**Technical Soils**

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

In addition to general University group requirements, majors in Technical Soils should take Bact. 10 or 70 and 71; Bot. 24, 25, 120; Chem. 3, 4, 5, or 10, 11 and 5 and 17 and 18 or 115; Physics 20, 21, 22; 5 hrs. of either Organic Chemistry or advanced Physics; Mathematics through 99; Geol. 3; Ag. Econ. 53; An. Sci. 5 hrs.; Hort. 3 hrs: A. E. 110, or C. E. 145; Applied Statistics 131, 132; Agron. 7 or 8, 56, 103, 107, 111, 112, 114, 155, 165.

**Master of Science Degree**

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

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

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

*Recommended classes. 44 may be taken. Engl. 111; Geol. 115, Range Mgt. 160.*
Doctor of Philosophy Degree

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

Crop Science

7. Grain Crops. The classification, history, and cultural methods involved in the production of grain crops. Two lectures, 1 lab. (3W or S) Dewey

8. Root and Miscellaneous Crops. Cultural methods, market grades and commercial possibilities of sugar beets, potatoes, tobacco, and fiber crops are studied. Three lectures. (3W)

103. Forage Crops. Alfalfa, clovers, grasses and other farm forages; classification and methods of production, harvesting and storage; meadow and pasture management. The place of forage crops in rotations and soil conservation is considered. Three lectures, 1 lab. (4F or S) Allred

109. Plant Breeding. Principles, techniques, and practices in breeding improved varieties of crop plants. Prerequisite: Zool. 112. four lectures, one 3-hour lab. (5F) Dewey

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

118. Weeds. Identification of weeds, the weed problems in agriculture, and methods of control. An assessment is made for field trips. Three lectures, one 3-hour lab. (4F) Tingey

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

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

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

208. Advanced Field Crops. Recent advances in the improvement and production of cereal, potato, and sugar beet crops. Prerequisites: Agronomy 7 and 8 and 103. Three lectures. (3S) McAllister

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

Soils

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

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

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

110. Soil Microbiology. See Bacteriology 110.

111. Soil Seminar. Review and discussion of current soil problems and literature. Required of all seniors in department. One lecture (1F or W) Staff

114. Soil Survey and Conservation. A study of soil forming factors and of soil classification, survey, and conservation. Prerequisite: Agron. 56 or 58 and 3 credits in field crop production or range management. Two lectures, 3 lab periods. (5S) Miller

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

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

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

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

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

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

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

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

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

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

Special Courses

116. Dry Farming. Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the mountain regions; and analysis of the possibilities in typical climatic areas and on important soil types. Prerequisites: Agron. 7 and 56. Two lectures. (2S) Staff
150. Special Problems. Subject and credit arranged. Conferences or laboratory investigations. Staff

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

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

ANIMAL HUSBANDRY

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

Students majoring in Animal Husbandry are expected to complete courses numbered 2, 10, 40, 110, 120, 125, 150, 155, 160, 165, 175.

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

Courses in Animal Husbandry are designed to train students for solving problems encountered in raising beef cattle, sheep and swine in the western region.

Major in General Animal Husbandry

A major in General Animal Husbandry prepares the student to be a livestock operator, a ranch manager, a county agent, or to take positions related to livestock raising with various other state and federal agencies. A student taking this major will be prepared to pursue a Master of Science degree after he has completed certain additional basic courses as required in the technical field.

Major in Technical Animal Nutrition

Majors in Technical Animal Nutrition are prepared for graduate work and technical employment in research. Students having high scholastic standing and marked ability in the fundamental sciences find real opportunities in this major.

In addition to general University requirements, majors in Technical Animal Nutrition should take: Agricultural Economics 53; Agronomy 6, 56, 103; Animal Husbandry 10, 110, 125, 150, 155, 160, 165, 175; Bacteriology 70, 71; Botany 24 or 25; Chemistry 3, 4, 5, 17, and 18; either Physiology or Chemistry 121, 122, 191; Dairy 110 or Poultry 1; Mathematics 35, 44; either statistics or Mathematics 97, 98, 99; Physics 6 and 7 or 17, 18, and 19; Veterinary Science 20; Zoology 3, 4, 112.

Master of Science Degree

The Animal Husbandry Department offers opportunity for study and research toward the Master of Science degree in Animal Production, Animal Breeding, and Animal Nutrition. In cooperation with other departments a Master of Science degree is offered in Animal Nutrition and Biochemistry (See Graduate School, Animal Nutrition and Biochemistry). Graduate study toward a Master of Science degree is acceptable by other Universities toward advanced degrees.

The following courses are acceptable for graduate credit toward a Master of Science degree in departments other than Animal Husbandry: 150, 160, 155, 175, and all courses in the 200 series.
**Doctor of Philosophy Degree**

The Animal Husbandry Department in cooperation with related departments is approved for offering the Doctor of Philosophy. (See also, Graduate School, Nutrition and Biochemistry for details on the Doctor of Philosophy degree in this area.) Detailed information may be obtained from the department or from the Dean of the Graduate School.

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

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<tr>
<th>Freshman Course</th>
<th>Credit</th>
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<tbody>
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<tr>
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<tr>
<td>Math. 35*</td>
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<tr>
<td>Botany 24* or 25*</td>
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<tr>
<td>Bact. 10* or 70* and 71</td>
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<tr>
<td>Agr. Econ. 53*</td>
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<tr>
<td>Soc. Sci. or electives</td>
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<td>Eng. 1*, 2*, 3*</td>
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<td>Vet. Sci. 20*</td>
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<td>Electives*</td>
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<td>Zool. 3*, 4*</td>
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<tr>
<td>Range Mgt. 160</td>
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<td>Agr. Econ. 58</td>
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<td>Vet. Sci. 120</td>
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<td>Zool. 112*</td>
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<td>Electives**</td>
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<td><strong>Total</strong></td>
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<table>
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<tr>
<th>Senior Course</th>
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<tbody>
<tr>
<td>A. H. 150*, 155*, 160*, 175*, 185</td>
<td>18</td>
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<td>Agron. 116</td>
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<td>20</td>
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<td><strong>Total</strong></td>
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</table>

*Required of all majors.
**Suggested electives Chem. 190 or Chem. 121, 122 and 191.

**Courses**

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

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

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

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

41 & 42. Livestock Practicum. Development of skill in the feeding, care, fitting and showing of beef cattle, sheep and swine. Two lab. periods. (W and S; 1 credit per quarter; 2 quarters required of majors) Staff
110. Beef Production. Factors involved in economical production of beef cattle, including organization of the enterprise, breeds of cattle, selection of breeding stock, production of maximum calf crop, handling and feeding animals of different ages on the range and in the feed lot, and marketing of surplus stock. Prerequisite: A. H. 10. (3F) Bennett

120. Swine Production. Systems of production with emphasis on those suited to western conditions. Breeding, management and feeding of the breeding herd, and of market swine. Prerequisite: A. H. 10. (3W) Steffen

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

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

155. Animal Breeding. Application of genetics to improvement of farm animals. Breeding systems, inheritance problems, fertility and sterility in larger farm animals are emphasized. Prerequisite: A. H. 10. Four lectures, one lab. (5S) Madsen

160. Livestock Production Problems. Attention is given various problems in livestock production, especially in Utah. Students are expected to apply knowledge acquired in previous courses. Prerequisite or concurrent registration; A. H. 150, 155. (3S) Fee for field trips, $30.00. Staff

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

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

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

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

210. Techniques in Nutrition Research. An original project will be completed with the primary objective being to orient students on how to plan, conduct, and summarize research in the field of animal nutrition. Prerequisite: A. H. 150. (2-6F, W or S) Harris


215. Nutrition Laboratory. Review and practice in techniques used in nutrition research. Two labs. (2W) Street

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

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

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

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

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

APPLIED STATISTICS

R. L. Hurst, Associate Professor and Head; K. H. Lu, Assistant Professor.

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

Majors in Applied Statistics are prepared for graduate work and employment in the research programs of Agricultural Experiment Stations, Colleges, Universities, and Industry.

Students majoring in Applied Statistics will be expected to complete Applied Statistics 131, 132, 141, 215, and (156 or 220) and at least 13 credit hours in the division of Mathematical Statistics. Majors in Applied Statistics should take a minor in one of the applied fields.


131. Statistical Methods. Sample-based inferences about populations. Individual and group comparisons. Tests of significance. Linear regression and correlation. Prerequisite: Mathematics 35 or equivalent. Three lectures, one lab. (4F) Hurst


156. Data Processing on Electric Accounting Machines. Adapting research data to mechanical processing. Card design; coding methods; experimental design; analysis of enumeration and measurement data. Prerequisite: Applied Statistics 131 and 132 or equivalent. Two lectures, one lab. (2S) Taught alternate years. Not given 1957-58. Lu

215. Design of Experiments. Fundamental principles of experimental design. Completely randomized; randomized blocks; latin squares; components of error; factorial arrangements; confounding; split plot; incomplete block designs; and fractional replication. Prerequisite: Applied Statistics 131 and 132 or equivalent. Three lectures, one lab. (3S) Hurst

COLLEGE OF AGRICULTURE

BOTANY AND PLANT PATHOLOGY

Orson S. Cannon, Professor and Head; W. S. Boyle, George W. Cochran, Professors; Herman H. Wiebe, Associate Professor; Arthur H. Holmgren, Associate Professor and Curator of the Intermountain Herbarium; Richard J. Shaw, Gene W. Miller, George W. Welkie, Assistant Professors; John L. Chidester, Research Associate; Eugene H. Cronin, M. Coburn Williams, Bryce N. Wadley, Collaborators, U. S. Department of Agriculture.

Bachelor of Science Degree in Botany

Study and research in Botany focus upon four major fields of study: cytology, pathology, physiology, and taxonomy. Course requirements for all fields of botany include: Botany 24, 25, 30, 117, 120, 240, 241, 242; Math 35; Chem. 10, 11; Zoo. 112. Required additional courses for the various fields of botany are as follows: Cytology: Botany 116, 118, 130 or 150; Zoo. 3, 4, 131; Chem. 121, 122; Physics 6, 7; Pathology: Botany 116, 130, 150; Zoo. 2 Ent. 108; Physiology; Botany 130 or 150; Zoo. 3, 4; Taxonomy: Botany 116, 118, 130, 150; Zoo. 107, 131, 214; Agronomy 56; Range Management 126; German 1, 2, 3; Latin 1, 2, 3.

Recommended additional courses for specialized fields include: Cytology: Botany 130 or 150; Math. 44, 97, 98, 99; Pathology: Botany 221, 222, 223; Ent. 220; Math. 44, 97, 98, 99; Chem. 124, 125; Physics 6, 7; Ag. Econ. 53; Bact. 10; Agronomy 56, 131, 132; Hort. 1, 4, 6, 131; Physiology: Botany 116, 130 or 150, 224; Math. 44, 97, 98, 99; Chem. 124, 125, 115; Physics 20, 21, 22; Bact. 180; Agronomy 56, 131, 132; Taxonomy: Agronomy 131, 132; Botany 104, 108, 112.

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

Master of Science Degree in Botany

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

Each candidate must submit a thesis on a topic within the field of his major subject. The thesis alternate, "Plan B" is not acceptable for the M. S. degree.

1. Principles of Biology. Basic life principles illustrated in both plant and animal forms. For lower division students except those who may elect Bot. 24, 25, or Zoo. 2 or 3, and 4. (5F, W, S) Shaw

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

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

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

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

112. Aquatic and Marsh Plants. A taxonomic and ecological study of aquatic and marsh plants. Emphasizes important food and cover plants for
wildlife. Assumes a knowledge of the fundamental principles of botany. (4F) Holmgren


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

120. Elementary Plant Physiology. The principal physiological processes of plants, including water relations, synthesis and use of foods, and growth phenomena. Prerequisites: Bot. 24 and Chem. 12 (Chem. 12 may be taken concurrently) (5W or S) Wiebe

121. Water Relations of Plants. Factors affecting the availability of water, its absorption and use in plants, and the effects of water deficits on plant processes. Prerequisite: Bot. 120. (3S) Taught alternate years. Offered in 1958-59. Wiebe

130. Principles of Plant Pathology. Fundamental principles underlying disease in plants. The types of disease and methods of study give the student a comprehensive view of plant pathology. Assumes a knowledge of botany fundamentals. Prerequisite: Bot. 24. (5F) Staff


150. Mycology. Comparative morphology and nuclear behavior of the fungi. A summary of the field with special attention given forms important in agriculture, medicine, and industry. Prerequisite: Bot. 25. (5W) Taught alternate years. Offered in 1957-58. Staff

221, 222, 223. Pathological and Physiological Techniques. Special methods applied to plant pathology, physiology, and related subjects. Registration only by special permission. (2F, W, S) Taught alternate years. Offered in 1957-58. Staff


234. Special Problems. Open to qualified students majoring in botany and related fields. Any quarter. Time and credit arranged. Registration only by special permission. Staff

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

*250. Research. Conduct original research in plant cytology, pathology, physiology, or taxonomy. Open to all qualified college students in botany and plant pathology. Any quarter. Time and credit arranged. Staff

*Individual Instruction.

DAIRY INDUSTRY

A. J. Morris, Professor and Department Head; George E. Stoddard, Professor; G. Q. Bateman and P. B. Larsen, Associate Professors; Lyman Rich, Professor and Extension Dairyman; Eugene E. Starkey, Assistant Professor; C. H. Mickelsen, Research Associate; George B. Caine, Professor Emeritus.
The course in dairying is planned with a general course for those students who plan to complete work for a terminal bachelor of science degree and a technical course for those who plan to continue their academic work toward more advanced degrees.

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

General Course in Dairy Production

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

Students must fill the general requirements of the University and the College of Agriculture and in doing so must take Zoology 3 and Botany 24 as part of the Biological Science group. The following courses are also required. Dairy 2, 6, 12, 110, 111, 112, 120, 121, 122, and at least three quarters of Dairy 215, Bacteriology 10 or 70 and 104; Chemistry 10, 11, and 12; Veterinary Science 20 and 120; Animal Husbandry 10; Mathematics 34; Agricultural Economics 58 or 62; Political Science 102; Library Science 106; Zoology 112; Agronomy 7, 56, and 103.

Technical Course in Dairy Production

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

In filling the general requirements of the University, dairy students must take Zoology 3 and Botany 24. The following courses must also be taken: Dairy 2, 6, 12, 110, 111, 112, 120, 121, 122, and at least 3 quarters of 215. Bacteriology 70, 71, and 104; Chemistry 3, 4, 5, 121, 122, 108, and 190 or 191; Veterinary Science 20, and 120; Animal Husbandry 10, 150, and 155; Mathematics 34 and 35; Agronomy 7, 56, and 103; Agricultural Economics 58 or 62; Zoology 112; Library Science 106, and Political Science 102.

General Course in Dairy Manufacturing

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

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

Business Course in Dairy Manufacturing

Plant Management

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

In addition to the general University requirements, students in the business course in Dairy Plant Management must take: Chemistry 10, 11, 12, 190 and 108; Ag. Econ. 53 and 62; Bacteriology 104 and 105; B. A. 20, 63, 154, 156 and 160. Engineering 4; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 215, and 354.

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

In addition to the general college requirement, students in the technical course in Dairy Manufacturing Research and Quality Control should take; Chemistry 3, 4, 5, 17, 18, 121, 122, 190, 108; Bacteriology 104, 105, 160, and 180; Appl. Stat. 131; Library Science 106; Physics 6; Math. 35 and 44; Dairy Industry 5, 6, 101, 102, 103, 104, 105, 110, 121, 215, and 254.
All dairy students must take 3 or more quarters of DI 215.

2. Introductory Dairying. Considers the history of the dairy industry. An introductory study is made of starting dairy herds; breeds of dairy cattle; cow testing associations; herd records, calf feeding, and general feeding.

Composition of milk, factors that affect it; practical composition and quality tests; farm dairy machines; production of quality milk; and dairy arithmetic will be studied. Practical skills will be emphasized. (4F & W) Morris & Starkey

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


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

12. Dairy Cattle Breeds and Selection. Breeds of dairy cattle, breed organizations and their programs, testing plans, pedigree analysis, record keeping and sire selection. (3F) Caine

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


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


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

110. Dairy Production. Growth and development of dairy heifers; herd management systems; housing and equipment; disease control; sanitation and quality milk production; economy in dairy farming; sire and heifer management. (5S) Caine

111. Dairy Cattle Judging and Evaluation. Types of various breeds of dairy cattle, judging individual cows, showing judging and type classification, type and production relations. Visits to dairy farms. (2S) Starkey


120. Dairy Cattle Breeding. Studies of the inherited characteristics of dairy cattle to be considered in selecting breeding stock. Artificial insemination of dairy cattle, physiology of reproduction, breeding programs and systems in use. (3W) (Prerequisite—Zool. 112) Starkey

122. Dairy Herd Mgt. and Operation. Dairy herd management, land­livestock balance, operational efficiencies, herd improvements, new developments and trends, and critical analysis of dairy literature. Student discussions and reports. (3S) (Open to seniors in Dairy Production or by permission of instructor.) Staff

215. Seminar. Discussions and reports of current literature and research reports by students. At least 3 quarters required of all dairy students. (1, F, W, S) Staff

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

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

HORTICULTURE

Leonard H. Pollard, Professor and Head of Department; Anson B. Call, Associate Professor and Extension Specialist; Alvin R. Hamson, Associate Professor; Robert K. Gerber, Robert A. Norton, and Dattaji K. Salunkhe, Assistant Professors; Otto Riethmann, Instructor; Odeah Kirk*, Superintendent, Max Williams, Acting Superintendent, Howell Field Station; Rulon Draper, Superintendent, Farmington Field Station; Leslie R. Hawthorn, Collaborator, U. S. Department of Agriculture.

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

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

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

In addition to the University group requirements, students in the technical course must take mathematics through 98. Chem. 3, 4, 5, 115, 121 and 122 and 190 or 191; Physics, 6, 7, or 17, 18, and 19; Bot. 24, 25, 30, 118, 120, 130; Bact. 70 and 71; Agron. 56, 107; App. Stat. 131 and 132; Hort. 101, 102, 115, 131, 1, 2, 4, 5, and 10; Zoo. 112; Ent. 108; Eng. 111.

Master of Science Degree

The department offers work towards a master of science degree in Horticulture. The outline of studies and the research program are designed around the objectives of the individual student.

Doctor of Philosophy

The Department of Horticulture in collaboration with the related departments of Botany and Plant Pathology, Zoology, Entomology, and Agronomy, offers a curriculum of study for the degree of doctor of philosophy in Plant Breeding. The general requirements for this degree are explained in the School of Graduate Studies, page 73. The particular requirements will depend upon the student's background in bachelor's and master's curriculums. The detailed information pertaining to this program can be obtained from the Head of the Department.

*On leave.
# Lower Division Courses in Horticulture

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<tr>
<td>Basic Communications</td>
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<td>Botany 24 and 25</td>
<td>10</td>
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<tr>
<td>Botany 30</td>
<td>5</td>
</tr>
<tr>
<td>Hort. 1</td>
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<td>Hort. 2</td>
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<td>Math. 34 &amp; 35</td>
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| Cr. | 48-50 |

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<td>Bact. 10 or 70 &amp; 71</td>
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<tr>
<td>Chem. 10, 11, 12, or 3, 4, 5</td>
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<tr>
<td>Hort. 10 or 11</td>
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| Cr. | 50-51 |

## Suggested Courses for Students in General Horticulture

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<td>Entomology 120</td>
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<td>Hort. 100</td>
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<tr>
<td>Hort. 108</td>
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<td>Zoology 112</td>
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<tr>
<td>Hort. 115</td>
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<td>Hort. 131</td>
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| Cr. | 48 |

## Suggested Course for Students Specializing in Floriculture

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<tr>
<td>English 111</td>
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<tr>
<td>Entomology 108</td>
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<td>Entomology 120</td>
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<td>Hort. 116</td>
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<td>Hort. 117</td>
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<td>Hort. 118</td>
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<td>Hort. 141</td>
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| Cr. | 52 |

## Suggested Course for Students Specializing in Pomology

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<tbody>
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<td>Chem. 121 &amp; 122</td>
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<td>Hort. 100</td>
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<tr>
<td>Agron. 107</td>
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<tr>
<td>Botany 120</td>
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<tr>
<td>Botany 130</td>
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<td>Hort. 108</td>
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<td>Hort. 115</td>
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<td>Hort. 151</td>
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<tr>
<td>Electives</td>
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| Cr. | 50 |
## Suggested Course for Students Specializing in Vegetable Crops

<table>
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<tr>
<th>Junior</th>
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<tr>
<td>Agron. 107</td>
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<td>Agronomy 155</td>
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<td>Agron. 109</td>
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<td>Applied Statistics 131 &amp; 132</td>
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<tr>
<td>Botany 120</td>
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<td>Botany 130</td>
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<td>Chem. 115</td>
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<td>Chem. 115</td>
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<td>Chem. 121, 122</td>
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<td>Entomology 108</td>
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<td>Eng. 111</td>
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<td>Hort. 101, 102</td>
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<td>Hort. 131</td>
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<td>Hort. 153</td>
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<tr>
<td>Zoology 112</td>
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<td>Electives</td>
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</tbody>
</table>

| Electives | 2 |

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

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

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

### 5. Vegetable Production Laboratory
- Offers practical experience in vegetable production. Field trips are arranged to important production areas and vegetable processing plants. (1F or S) Pollard, Hamson

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

### 11. Garden Flowers
- Principles and practices of growing garden flowers. (3S) Taught alternate years. (Not taught 1957-58) Riehmann

### 100. Pruning and Grafting
- A practical course for all students in the college dealing with the science and art of pruning and grafting of horticultural plants. Special emphasis is placed on fruit trees, but the small fruits and ornamental trees and shrubs are also included. Six lectures, 24 hours of arranged lab work and at least 10 hours of practical experience in the field required. (2W) Norton

### 101, 102. Advanced Horticulture
- Fundamental principles relating to horticultural practices; growth and development, nutrition, water relations, temperature, light, fruit setting, and growth regulators. Prerequisite: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 or 4. (4W, 4S) Taught alternate years. (Not taught 1957-58) Hamson, Gerber

### 105. Major Vegetable Crops
- Classification, identification, origin, history, types, and uses of vegetables. (3) 2 labs, 1 lect. Taught alternate years. (Not taught 1957-58) Hamson

### 108. Small Fruit Production
- The culture of strawberries, raspberries, grapes and other small fruits in home and commercial plantings. (3W) (Taught 1957-58) Norton

### 115. Breeding Horticultural Plants
- Fundamental principles and practices of plant breeding in the improvement of fruit, vegetable and ornamental plants. Prerequisites: Zool. 112; Hort. 1 and preferably 4, 10, and 108. (4S) Taught alternate years. (Not taught 1957-58) Pollard, Hamson

### 116, 117. Commercial Greenhouse Management
- Principles and practices of commercial greenhouse management. Prerequisite: Hort. 1, 6, 10; Bot. 24, 25. (3F, 3W) Taught alternate years. (Not taught 1957-58) Riethmann
118. Floral Design. Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. (3F) Taught alternate years. (Taught 1957-58) Riehmann

119, 120. Systematic Floriculture. Systematic study of garden flowers. Prerequisites: Hort. 1, 6, 10; Bot. 30, 120. Systematic study of plants grown by florists. (3F, 3W) (Not taught 1957-58) Riehmann

130. Vegetable and Flower Seed Production. Methods and commercial possibilities of vegetable and flower seed production. A required field trip is taken into seed-producing areas in southern Idaho. (4F) Taught alternate years. (Not taught 1957-58) Pollard, Hawthorn

131. Agricultural Sprays and Dusts. Preparation, properties, and uses of agricultural chemicals used in disease, insect, and weed control; application of fruit thinning, growth regulator, and nutritional sprays. Design, operation, and care of the application equipment. Two laboratory periods a week. Jointly administered by the Departments of Botany and Plant Pathology, Horticulture, and Zoology, Entomology, and Physiology. Prerequisites: Bot. 130, Ent. 108 or special permission. (5S) Davis, Norton

140. Processing of Fruits and Vegetables. History and methods of preservation of fruits and vegetables by canning, freezing, dehydration; processing of juices and concentrates; packing, organoleptic appraisal, and quality control. Visits to processing plants, one laboratory period per week. Prerequisites: Chem. 3, 4, 5, or 10, 11, 12; Bot. 24, 25; Bact. 10 or 70 and 71, or special permission. (4F) Salunkhe


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

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

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

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

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

220. Advanced Breeding. A study of special techniques and practices used in the breeding of horticultural crops. Prerequisite: Hort. 115. (3 arr.) Pollard, Hamson

221. Advanced Horticultural Problems. A study of current research as related to important horticultural problems. Prerequisites: Hort. 101, 102; Agron. 56; Botany 120. (4W) Staff

POULTRY HUSBANDRY

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

Students majoring in Poultry Husbandry are expected to complete 30 credits of work in Poultry Husbandry. In addition to the courses listed under Poultry Husbandry, courses that will also count toward a Poultry major are: Animal Husbandry 155, and Veterinary Science 120 and 170.
The Department offers courses leading to the master of science degree in Poultry Husbandry.

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

**Courses**

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<tr>
<th>Freshman Course</th>
<th>Credit</th>
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<td>Veg. Crops</td>
<td>3</td>
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<tr>
<td>P. H. 1 &amp; 2</td>
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<td>Chem. 3, 4, 5 &amp; 11, 12</td>
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<tr>
<td>Math. 34 or 35</td>
<td>3 or 5</td>
<td>P. H. 8</td>
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<tr>
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<td>3</td>
<td>Agron. 6 &amp; 7 or 8 &amp; 56</td>
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<td>Soc. Sci.</td>
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<td>Zool. 3</td>
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<td>An. Hus. 10</td>
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<td>Zool. 112</td>
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<td>P. H. 126, 107, 105, or 106, 104</td>
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<td>Agron. 103</td>
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<td>Vet. Sci. 170</td>
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<td>Physiol. 121</td>
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<tr>
<td>Entom. 108</td>
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<td>PH 125, 126, 105, or 106</td>
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<td>D. H. 109</td>
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<td><strong>Total</strong></td>
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**Suggested Electives:** Irr. and Dr. 10; Vet. Sci. 140; Animal Husbandry 151, 155; Agron, 131, 132; Chemistry 125, 126, 190; English 5, 111.

**Courses**

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

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

8. *Turkey Production.* A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small farm flock or large commercial flock management are emphasized. (3F) Taught alternate years. (Taught 1958-59) 

104. *Incubation.* Problems involved in incubation, embryology, and hatchery operations. Two lectures and one lab. Lab. arr. (3S) Taught alternate years. (Taught 1958-59) 

105. *Poultry Management.* Problems of location of poultry farm, farm planning, renewing the flock, brooding, marketing and problems affecting labor income. Prerequisite: Poultry 1 (3W) Taught alternate years. (Taught 1958-59) 

106. *Poultry Breeding.* Consideration is given to selection pressure, inbreeding, heritability, expected gains, mating systems, and selection indexes. Prerequisites: Poultry 1, Math. 34, and Zool. 112. (4F) Taught alternate years. (Taught 1957-58)
107. Poultry Feeds and Feeding. A study of the nutritive requirements of poultry, the composition of poultry feedstuffs, methods of feeding and formulation of rations for special needs. Prerequisite: Poultry 1. Three lectures, one Lab. (4W) Taught alternate years. (Taught 1957-58) Anderson

108. Poultry Products. Problems in processing, grading, packaging, transporting, labeling, and storing poultry products. (1S) Taught alternate years. (Taught 1957-58) Draper

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

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

Poultry Diseases. (See Veterinary Science 170)


VETERINARY SCIENCE

Merthyr L. Miner, Professor and Head of Department; LeGrande Shupe, Associate Professor; James H. Bell, Joseph T. Blake, J. Alan Thomas, Ross A. Smart, Assistant Professors. Don Thomas, Extension Veterinarian; Wayne Binns, Collaborator in Research, U.S.D.A.

Courses in this department are not designed for training students to become veterinarians. Students desiring to study toward a degree in veterinary medicine (D. V. M.) must have at least two years and preferably three of pre-veterinary training at some authorized college or university, completing the basic required courses. They should then apply for entrance into a school of veterinary medicine. Enrollment in veterinary schools is limited. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry are eligible for entrance into all veterinary schools if the requirements in the basic sciences are fulfilled.

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

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

120. Animal Hygiene. Principles of animal sanitation in relation to disease control. Federal and state disease control programs and the etiology, symptoms, and control measures of the more prevalent diseases are also studied with demonstrations of first aid and the common farm operations on animals. 3 lectures, 1 lab. (4S) Miner

140. Veterinary Parasitology. Detailed study of the scientific name, common name, class, range, pathogenesis, life cycle, methods of control, and treatment of common internal and external parasites of domestic animals. 4 lectures, 1 lab. (5F). Taught alternate years (taught 1958-59). Miner

150. Artificial Insemination of Animals. A study of the basic concepts of the science of reproduction as related to artificial insemination, training in the art of artificial insemination, and the management of artificial insemination organizations. The course is for majors in the animal science field who have had courses in anatomy and physiology, bacteriology, nutrition, and breeding. 1 lecture, 2 labs. (3S) Miner
170. Poultry Hygiene. Principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of common diseases affecting poultry in this region. Taught alternate years. (Taught 1957-58). 2 lectures, 1 lab. (3S) Miner

200. Special Problems. Open to upper division or graduate students majoring in subjects related to Veterinary Medicine and who wish to study a particular phase of disease in animals. Any quarter. Time arranged. Credit 1 to 3. Staff

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

230. General Pathology. An introduction to the cause and mechanism of disease processes: degenerative changes, circulatory disturbances, inflammation, regeneration, neoplasms, and food deficiency alterations. Prerequisites: Zoo. 118 and 128. 3 lectures, 2 labs. (5W) Shupe

231. Systemic Pathology. A study of the diseases of the cardiovascular, blood and hemopoietic, respiratory, digestive, urinary, genital, endocrine, nervous, locomotor and tegumentary systems. Prerequisite: V.S. 230. 3 lectures, 2 labs. (5S) Shupe

Suggested Pre-Veterinary Courses

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

*Zoology 3, 4, 112, 118; *Chemistry 3, 4, 5; *Organic Chemistry 121, 122; *Physics 17, 18, 19; *Mathematics 34, 35, and 46; *Botany 24; Animal Husbandry 1, 10, 150; Poultry 1, 2; Dairy 2, 110; and *Basic Communications 1, 2, 3.

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

AGRICULTURAL EXPERIMENT STATION

Wynne Thorne, Director

The Agricultural Experiment Station, established in 1889, is a major division of the University. It is responsible for conducting research in Utah under federal and state legislation. Its primary objective is to conduct experiments and scientific researches that have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and the development and improvement of the rural home and rural life. Results of this research are published in bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The Agricultural Experiment Station staff numbers approximately 125. Many of them are members of the teaching faculty of the University. Some of them also divide their time with the Agricultural Extension Service of the University. In addition, several employees of the U. S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

Main offices of the Agricultural Experiment Station are on the University campus in the new agricultural science building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed among the various University buildings.

Greenhouses are maintained for investigations in horticulture, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the University campus, at the College of Southern Utah, at Snow College at
Ephraim, at the U. S. Forest Service Desert Range Station, at the Benmore Experimental Range in Tooele County, and on the ranges in different parts of the state.

The Station maintains the following field stations staffed with one or more technically trained men:

**Howell Field Station for Horticultural Research**, located in Weber County, north of Ogden. This is a 71-acre tract of land plus laboratory and storage buildings used for investigations in the production, harvesting, storage and marketing of fruit.

**Farmington Field Station** at North Farmington. This consists of 61 acres of land and a fruit and vegetable processing laboratory and is used for experimental work in horticulture, floriculture and vegetable crops.

**Sanpete Field Station** located north of Ephraim and operated cooperatively with Snow College. This is a 77 acre tract used for demonstrations on crop production and dairying.

**Range Livestock Field Station** is located in the vicinity of Cedar City and is operated cooperatively with the College of Southern Utah. It consists of 1100 acres on the Valley Farm west of Cedar City, 2820 acres of summer range land east of Cedar City and 7800 acres of leased winter range land near Modena. Breeding and management of range sheep and beef cattle are studied.

The Station also maintains the following experimental farms:

**Animal Husbandry Farm** north of the campus contains 287 acres of land used for pastures and feed production. Investigations include the breeding, nutrition and management of sheep, swine and beef animals.

**Cache Valley Reclamation Farm** located northwest of Logan in the center of poorly drained pasture lands consists of 110 acres. This is used for research on drainage and improvement of fine textured water logged lands.

**Dairy Farm**, including 183 acres of land, barns, milking parlor and a house. The Station maintains an experimental Holstein-Fresian and Jersey dairy herd of about 100 pure-bred animals. Pasture investigations are also conducted.

**Evans Farm**, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Department of Agriculture for a study of improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

**Greenville Farm**, a 36-acre tract, is used for experimental work in plant breeding and other phases of crop production.

**Nephi Farm** is used for experimental work in dry farming and range seeding. This farm has 103 acres.

**Panguitch Farm** north of Panguitch, consists of 150 acres of irrigated land with accompanying buildings. Crop production in high altitude areas and breeding of beef cattle are the principal investigations conducted.

**Poultry Farm**, in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.

**Turkey Farm**, is a 33-acre farm east of the campus used for studies in turkey breeding, nutrition, and disease control.

**Benmore area** of 3500 acres of reseeded range pasture is used in cooperation with the U. S. Department of Agriculture for studies in management of range cattle and for research in range management.

The Station also owns farm plots near the University and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these are soil surveys; plant disease surveys; problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of social problems connected with rural
living; gathering of snow survey data; problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and, third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.


COOPERATIVE EXTENSION SERVICE

Carl Frischknecht, Director

Farm income is expressed in terms of cash, good food, comfortable homes, and pleasant surroundings. Farm ownership and close contact with nature develop virtues in farm families that result in the highest type of citizens.

The main objective of the Extension Service is to aid rural people in improving farm income and in developing useful, satisfactory lives. Its educational programs are designed to help people to help themselves. Rural leadership is developed by encouraging groups of people to analyze their own problems. A plan to solve these problems becomes the Extension program of work, jointly determined by Extension workers and local people.

Extension programs conducted with and for the people usually result in increased production per acre and per animal unit, more efficient marketing, conservation of soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work which gives boys and girls more appreciation for the farm and home and better understanding of national and world affairs.

The Extension Service is one of the three main divisions of the University and the educational arm of the U.S. Department of Agriculture. Its agricultural and home agents serve in every county. Cooperating with the agents is a state staff of specialists in agricultural economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, cattle marketing, 4-H Club work, clothing, consumer education, education, dairy manufacturing, entomology, home furnishings, home management, horticulture, irrigation, marketing, nutrition, poultry, recreation, rural sociology, and soil conservation. These specialists work out from the University in all portions of the state.

To help train rural leaders, the Extension Service conducts free, non-credit courses in various agricultural and home economics subjects at the University and at other locations throughout the state.

The Smith-Lever Act of 1914, which established the Extension Service as a unit of each Land-Grant college, specified that the job of Extension was “to give instruction and practical demonstrations to rural people and to the industrial classes to the end that rural life and welfare would be improved.”

Extension is a two-way organization. It takes (1) the findings of research to the people of the state and, (2) it brings the problems affecting the welfare of the people back to the research agencies for solution.
<table>
<thead>
<tr>
<th>Department</th>
<th>Page</th>
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<tbody>
<tr>
<td>Business Administration</td>
<td>108</td>
</tr>
<tr>
<td>Accounting</td>
<td>109</td>
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<td>Management</td>
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<td>Industrial Management</td>
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<td>Merchandising</td>
<td>113</td>
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<td>Secretarial Science</td>
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<td>Economics</td>
<td>117</td>
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<td>History and Political Science</td>
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<td>Pre-Legal Training</td>
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<tr>
<td>Social Work</td>
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</table>
The following departments are included in the College of Business and Social Sciences—Business Administration, Economics, History and Political Science, and Sociology. These basic departments are further divided to permit students to major in more specialized areas. Business Administration includes Accounting, Business Education, Business Management, Industrial Management, Merchandising, and Secretarial Science. Students may major in any one of these fields. Majors in History, Political Science, and Pre-law are possible in the department of History and Political Science. Sociology offers majors in either Sociology or Social Work. There is only one major—Economics—in the Department of Economics.

Although there are many major areas open to students, the emphasis of the College is on broad, liberal training. Certain specialties, specifically Accounting, Industrial Management, and Secretarial Science, require greater concentration and more required courses, but even here there is concern for a broad educational base. In those major fields where course specification is limited, advisers will consult with students in the selection of courses. All course programs in every area must be approved by the adviser and the dean.

In general, the business division of the college trains students for the commercial world. The great majority of graduates here go directly into some business activity. A few continue on to graduate school, and wherever such a plan is known, the course program is geared to this purpose. The business community wants people with broad, basic knowledge, competence in the communication skills, ability to think and act, and a degree of specialized training in a particular area. The curriculum attempts to achieve this.

Social science graduates generally look toward teaching, government service, and certain professions, such as law and social work. There are a number who major in the social sciences for the principal purpose of acquiring a liberal education. There are also an increasing number who plan a business career, but consider that the social science background and degree provides a substantial basis for business.

It should be emphasized that the subject areas in the College of Business and Social Sciences have been taught at the University since its founding. The business department was the second one established in the country west of the Mississippi. Hundreds of students have graduated with degrees in these fields, and their subsequent records confirm the quality and character of the program.

**BUSINESS ADMINISTRATION**

E. B. Murray, Professor and Acting Head; V. D. Gardner, W. H. Bell, Professors; Ina Doty, Norman S. Cannon, Associate Professors; C. D. McBride, Floris Olsen, William V. Tezak, Howard Calder, Glenn F. Marston, Assistant Professors; Helen Lundstrom, Annette Donovan, Instructors.

Students in Business Administration may major in Accounting, Business Education, Business Management, Industrial Management, Merchandising, or Secretarial Science. Students majoring in Secretarial Science should register under the advice of the instructional staff for Secretarial Science.

**Recommended Courses**

**Freshman and Sophomore Years, General Education Background**

**Military Science or Physical Education**

**Biological Science Requirements:** Biology 1, Physiology 4.
Communications Requirements: Basic Communications (Freshmen.)

Exact Science Requirements: 10 hours from the following; Chemistry 1, 2; Geology 3; Math. 34, 55, 60; Physical Science 31, 32, 33; Physics 3.

Social Science Requirements: 10 hours from the following; Economics, 51, 52; History 4, 5, 6, 10; Political Science 1, 10; Psychology 53; Social Science 1, Sociology 70.

Language Arts Requirements: 10 hours from the following: Art 3, 26; English 40, 41, 53, 54, 60, 61; Landscape Architecture and Planning 3.

Departmental Foundation Work: Ag. Econ. 62; Eng. Drawing 59; B. A. 1, 2, 3, 20, 30; Political Science 11, 12, 13; Secretarial Science 41, 42, 65, 92, and 98; Math. 60.

Junior and Senior Year Concentrations

Accounting B. A. 101, 102, 103, 104, 105, 111, 121, 126, 127, 129, 130, 131, 132, 140, 149, 164, 199; Political Science 104, 105, 106, 107, 108; English 110; Secretarial Science 175.

A—Business Management: B. A. 109, 128, 130, 131, 132, 133, 134, 135, 149, 151, 152, 153; Economics 125, 126, 127, 165, 171, 174; Political Science 104, 105, 106; I. E. 120.

B—Industrial Management: See succeeding page.

Merchandising: Ag. Econ. 62; B. A. 131, 132, 149, 150, 151, 152, 153, 154, 156, 157, 160, 161, 162, 163, 164.

Accounting

1, 2, 3. Introductory Accounting. Lectures, questions, problems and practice sets that require application of the theory advanced. Principles and techniques learned here are basic to further study of accounting and to understanding the common problems of business. Technique emphasized. (B. A. 1-4 FW) (B. A. 2-4 WS) (B. A. 3-4 S) Staff

100. Accounting for Non-Commercial Students. For Engineering, Agriculture, Home and Family Living, Forestry, and other non-commercial students. (4F and S 1957-58) Gardner; Cannon

101, 102, 103. (Intermediate) Accounting Principles. Fundamental techniques of accounting. Gives a working knowledge of accounting as it serves the business executive. Valuable to students who aspire to a career in accounting, and also to teachers, lawyers, engineers, and farmers. Graduate credit may be allowed upon completion of special work. (4F, W, S) Cannon


121. Auditing Theory and Practice. Principles and procedures presented to give practical knowledge of auditing. Prerequisite: A good working knowledge of accounting principles and techniques. (5F) Cannon

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


129. Government Accounting. Basic principles underlying treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. (3W) Cannon
Managerial Accounting. Emphasizes the use of accounting as a tool of control for management. Major aspects include budget and managerial control, break-even charts, selection of alternatives. Required of all Bus. Adm. Majors. (5F) Gardner

Internship in Accounting. Practical experience with public accounting firms in intermountain region and Pacific Coast for selected seniors. Credit arranged, not to exceed 6. W. Staff

Management

Introductory Business. A survey of the general problems of business organization. The course is designed for all students who plan to major in any phase of Business Administration. (5W or S) Staff

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

Business Mathematics. Students who score 80 per cent or above in the placement examination, or who take college algebra should not register for this course. Does not fill group requirement. (3F) Tezak

Foremanship and Supervision. A comprehensive study of the place and functions of the foreman or supervisor in industry and business. Emphasized foremanship as an important part of management. Provides the practical information a foreman or supervisor needs in his work. Prerequisite: I. E. 120. Three lectures. (3F) McBride

Job Evaluation and Wage Incentives. The place of job evaluation and wage incentives and their use in successful management. How to set up these techniques and put them into operation. A practical course for both students and employed personnel for direct application in all levels of management. Prerequisites: I. E. 120 and B. A. 117. Three lectures. (3S) McBride

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

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

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

Development of Scientific Management. A study of the contributions of Taylor, the Gilbreths, Emerson, Barth, and other leaders in the development of improved management. (3F) Staff

Production Planning and Control. Study and applications of principles of sound analysis leading to installation and operation; product engineering, production engineering, scheduling, inventory control, order preparation, tool control, dispatching, and cost control in the production process. (3S) Staff

Insurance. Studied from the standpoint of the consumer of insurance services. Topics treated include: types of life, property, and casualty insur-
ance contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management, and government supervision over insurance companies. (3W) Calder

141. Real Estate. Introduction to real estate contracts, forms, principles, and recent Federal housing legislation. (3W) Calder

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

149. Business Policy. A co-ordinating course aimed to develop perspective, judgment, and facility in solving problems in production, distribution, personnel, finance, control, and social aspects of business. Prerequisites, B. A. 130, 150, 131, 132. Required of all Business Administration majors. (5S) Gardner

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

164. Conference Leading. Principles and practice in conference leading applied to methods used in industry. Emphasis given to preparation, use, and evaluation of this method as it affects industrial education programs. Workshop or lecture. (3 Arr.) McBride

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

Business Education

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

Industrial Management

The degree program in Industrial Management provides courses in executive development for people who desire to prepare for supervisory and executive work in business and industry. It includes a strong foundation of education and experience in one or more of the areas of engineering, technology, business, or economics.

In addition to completing the required curriculum of academic studies it is recommended that the student have at least thirty weeks of practical work experience in business or industry. This is made possible through a cooperative arrangement on summer work with business and industrial organizations in the region.

The curriculum below is recommended. Substitutions can be made if approved by the adviser and dean.
### Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>English 1, 2, 3, Basic Com.</td>
<td>9</td>
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<tr>
<td>Mathematics</td>
<td>8</td>
</tr>
<tr>
<td>Economics 51, General Econ.</td>
<td>5</td>
</tr>
<tr>
<td>Psychology 53, General Psy.</td>
<td>5</td>
</tr>
<tr>
<td>Political Science 1, or equiv.</td>
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</tr>
<tr>
<td>Literature</td>
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<td>M. S., A. S., or P. E.</td>
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<tr>
<td>Approved electives</td>
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<tr>
<td>Work experience in Industry, 10 weeks</td>
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### Sophomore

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Exact Science</td>
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<tr>
<td>Speech 21, Intermediate Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Biology</td>
<td>5</td>
</tr>
<tr>
<td>Political Science 11, Commercial Law</td>
<td>3</td>
</tr>
<tr>
<td>Eng. Dr. 59, Blueprint Read. and Ind. Draw</td>
<td>3</td>
</tr>
<tr>
<td>T. E. 58, Manufacturing Processes</td>
<td>2</td>
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<tr>
<td>Soc. 70, Introductory Sociology</td>
<td>5</td>
</tr>
<tr>
<td>Physiology or Bacteriology</td>
<td>5</td>
</tr>
<tr>
<td>B. A. 20, Introduction to Business</td>
<td>3</td>
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<tr>
<td>Economics 52</td>
<td>5</td>
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<tr>
<td>M. S., A. S., or P. E.</td>
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<tr>
<td>Approved electives</td>
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<td>Work experience in Industry, 10 weeks</td>
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### Junior

<table>
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<tr>
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<tbody>
<tr>
<td>I. E. 104, Occupational Analysis</td>
<td>3</td>
</tr>
<tr>
<td>I. E. 102, Instructional Aids</td>
<td>3</td>
</tr>
<tr>
<td>I. E. 120, Personnel Relations</td>
<td>3</td>
</tr>
<tr>
<td>Psychol. 155, Psychol. of Bus. &amp; Ind.</td>
<td>3</td>
</tr>
<tr>
<td>Psychol. 161, Social Psychol.</td>
<td>3</td>
</tr>
<tr>
<td>Psychol. 127, Psychol. of Learning</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 125, Trade-Unionism &amp; Col. Barg.</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 126, Trade-Unionism &amp; Law</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 127, Social Security</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 128 Functions of Management</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 1, 2, Introductory Accounting</td>
<td>8</td>
</tr>
<tr>
<td>Electives or M. S.</td>
<td>13</td>
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<tr>
<td>Work experience in Industry, 10 weeks</td>
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### Senior

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<tr>
<th>Course</th>
<th>Credit</th>
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<tbody>
<tr>
<td>B. A. 117, Foremanship and Supervision</td>
<td>3</td>
</tr>
<tr>
<td>I. E. 118, Industrial Safety</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 119, Job Eval. &amp; Wage Incentives</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 164, Conference Leading</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 133, 134, 135, Industrial Mgm't. Prob.</td>
<td>3</td>
</tr>
<tr>
<td>Psychology 121, Individual Differences</td>
<td>3</td>
</tr>
<tr>
<td>B. A. 147, Administration of Small Bus</td>
<td>3</td>
</tr>
<tr>
<td>Sociology 158, Human Rel. in Indus.</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 150, Comparative Econ. Systems</td>
<td>3</td>
</tr>
<tr>
<td>Electives or M. S.</td>
<td>13</td>
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</table>

Electives may be in one of two of the following areas:

### A. Engineering

<table>
<thead>
<tr>
<th></th>
<th>B. Technology</th>
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</thead>
<tbody>
<tr>
<td>1. Civil</td>
<td>1. Automotive</td>
</tr>
<tr>
<td>2. Electrical</td>
<td>2. Diesel</td>
</tr>
<tr>
<td>3. Tool</td>
<td>3. Aeronautics</td>
</tr>
<tr>
<td>5. Welding</td>
<td>5. Engineering Drawing</td>
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</tbody>
</table>

### B. Technology

6. Welding
7. Woodwork & Building Const.
8. Machine Tool

### C. Business

1. Accounting
2. Business Management

### D. Economics

Note: These features include:
1. The broad general and liberal arts base.
2. The strong emphasis on the social sciences.
3. The electives (total 44 hours) for specialization in a technical field.
4. A major in the industrial management field.
5. The work experience requirement.
Merchandising

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

63. Salesmanship. The history, development and opportunities in sales work. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance are studied. Special projects are carried out in relation to a particular type of selling. Lectures and assigned cases. (4F or S) Calder

151, 152, 153. Problems in Merchandising. Selected cases are used to teach methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. (3F, W, S) Calder

154. Purchasing. The significance of purchasing as a major activity in modern business. Consideration given organization, policies, and control of the procurement function. Lectures and problems. (3F) Staff

156. Principles of Advertising. Intended for those who as business executives will direct publicity programs: includes study of the structure of advertisements, appeals used in the preparation of advertisements for different products, choice of media, consumer research, and the work of advertising departments and agencies. (5F) Calder

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

160. Sales Management. Aims to give a broad view of important phases of sales administration, planning, and execution applied to manufacturing and wholesale concerns. Deals specifically with the structure and functioning of the sales organization and correlation of its activities with those of production and other departments of the business enterprise. (5W) Calder

161, 162, 163. Problems in Retail Distribution. The marketing process from the viewpoint of the retail distributor: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. (3F, W, S) Calder

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

Secretarial Science

Degree Program in Secretarial Science

Curriculum in Secretarial Science For B. S. Degree

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tr>
<td>SS 30</td>
<td>Business Communications</td>
<td>3</td>
</tr>
<tr>
<td>SS 41</td>
<td>First-Quarter Typewriting</td>
<td>2</td>
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<tr>
<td>SS 42</td>
<td>Business Typewriting</td>
<td>2</td>
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<tr>
<td>SS 43</td>
<td>Secretarial Typewriting</td>
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<tr>
<td>SS 51</td>
<td>Intro. to Secretarial Train.</td>
<td>3</td>
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<tr>
<td>SS 65</td>
<td>Filing</td>
<td>3</td>
</tr>
<tr>
<td>SS 69</td>
<td>Transcription</td>
<td>3</td>
</tr>
<tr>
<td>SS 70</td>
<td>Transcription</td>
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<tr>
<td>SS 71</td>
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<tr>
<td>SS 75</td>
<td>First-year Shorthand</td>
<td>9</td>
</tr>
<tr>
<td>SS 80</td>
<td>Intermediate Shorthand</td>
<td>9</td>
</tr>
<tr>
<td>SS 81</td>
<td>Ten-Key or Full-Key Posting</td>
<td>2</td>
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<tr>
<td>SS 82</td>
<td>Business Machines</td>
<td>2</td>
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<tr>
<td>SS 94</td>
<td>Keydriven Calculator</td>
<td>2</td>
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</tbody>
</table>
Students who have already mastered certain skills may be excused from some of the above requirements.

Students who wish to qualify for a teaching certificate should add the following courses: Psychology 53 and 102, Education 113, 114, 161, 111, 127, 129, and 130; Bacteriology 155; Secretarial Science 179 and 180.

**Two-year Secretarial Program**

**Certificate granted upon completion**

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

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**First Year**

<table>
<thead>
<tr>
<th>Courses</th>
<th>Cr.</th>
<th>Basic Communications</th>
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<tr>
<td>Fall</td>
<td></td>
<td>1st Q. Shorthand 75</td>
<td>3</td>
<td>2nd Q. Shorthand 76</td>
<td>3</td>
<td>3rd Q. Shorthand 77</td>
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<tr>
<td>1st Q. Shorthand 75</td>
<td>3</td>
<td>Typewriting 42</td>
<td>2</td>
<td>Psychology 53</td>
<td>5</td>
<td>Filing 65</td>
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<tr>
<td>Typewriting 41</td>
<td>2</td>
<td>SS 92 or 94</td>
<td>2</td>
<td>P. E. or M. S.</td>
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<tr>
<td>Biology</td>
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**Second Year**

<table>
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<tr>
<td>Int. Shorthand 80</td>
<td>3</td>
<td>Int. Shorthand 81</td>
<td>3</td>
<td>Int. Shorthand 82</td>
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<td>Transcription 69</td>
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<td>Econ. 51</td>
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<td>Econ. 52</td>
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<tr>
<td>Political Science 11</td>
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<tr>
<td>Office Practice 167</td>
<td>2</td>
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**Two-Year Clerical Training Program**

**Certificate granted upon completion**

A two-year clerical program is offered for those who wish to qualify themselves for a clerical position. The official certificate is granted to those who successfully complete the two-year course.
## Two-Year Curriculum—Clerical

<table>
<thead>
<tr>
<th>Fall Quarter</th>
<th>Winter Quarter</th>
<th>Spring Quarter</th>
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</thead>
<tbody>
<tr>
<td>Basic Communica-tions 1</td>
<td>Basic Communica-tions 2</td>
<td>Basic Communica-tions 3</td>
</tr>
<tr>
<td>Business Mathematics 30</td>
<td>Business Communications 30</td>
<td>Indexing and Filing 65</td>
</tr>
<tr>
<td>21 Beginning Typewriting 41</td>
<td>21 Business Typewriting 42</td>
<td>21 Secretarial Typewriting 43</td>
</tr>
<tr>
<td>Business Mach. 92</td>
<td>Key-Driven Calculator 94</td>
<td>21 Secretarial Training 51</td>
</tr>
<tr>
<td>General Psych. 53</td>
<td>Biology (or BA 20)</td>
<td>21 Posting Machines</td>
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<tr>
<td>Physical Education</td>
<td>Physical Education</td>
<td>99 or 98 Office Practice 167</td>
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<table>
<thead>
<tr>
<th>SECOND YEAR</th>
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</thead>
<tbody>
<tr>
<td>Fall Quarter</td>
<td>Winter Quarter</td>
<td>Spring Quarter</td>
</tr>
<tr>
<td>Accounting 1</td>
<td>Accounting 2</td>
<td>Vocabulary 5</td>
</tr>
<tr>
<td>Commercial Law 11</td>
<td>Commercial Law 12</td>
<td>Salesmanship 63</td>
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<td>I. B. M. 75</td>
<td>I. B. M. 76</td>
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<tr>
<td>Electives</td>
<td>Economics 51</td>
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<td>Physical Education</td>
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</table>

*Not required of students who have had previous training in typewriting and can type at least 30 words per minute.

**Not required of students who have had previous training in typewriting and can type at least 50 words per minute.

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

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

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

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

45. **Speed Building.** Remedial typewriting; emphasis on improvement of accuracy and speed. (1F, W, S) *Donovan*

51. **Introduction to Secretarial Training.** Designed to develop secretarial efficiency through study of requirements, duties, and personal qualities of a secretary with special emphasis on personal appearance, manner, applying for and obtaining a position. Required of all lower-division secretarial science students. (2S) *Doty*

65. **Filing.** Training in alphabetic, numeric, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters and cards. (3F, W, S) *Lundstrom*

69. **Transcription.** Designed to develop skill and speed in transcription. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words per minute. Must be taken with SS 80. (1F, W) *Doty; Donovan*
70. **Transcription.** Continuation of 69. Must be taken with SS 81. (1W, S)  
   Doty; Donovan

71. **Transcription.** Continuation of 70. Must be taken with SS 82. (1S)  
   Doty

75. **First-Quarter Shorthand.** For students who have had no previous training in shorthand; includes study of fundamentals of simplified Gregg shorthand. (3F or W)  
   Doty; Olsen

76. **Second-Quarter Shorthand.** Continuation of course 75. Introduction of new-matter dictation. (3W, S)  
   Doty; Olsen

77. **Third-Quarter Shorthand.** Continuation of course 76. Intensive practice in new-matter dictation. (3F, S)  
   Olsen; Doty

80. **Intermediate Shorthand.** For students who have had previous training in shorthand and who are able to take dictation at not less than 60 words a minute and type at least 40 words a minute. Includes review of the theory of simplified Gregg shorthand and development of new vocabulary. Students must register for Transcription 69. (3F, W)  
   Olsen and Donovan

81. **Intermediate Shorthand.** Continuation of 80. Must be accompanied by Transcription 70. (3W, S)  
   Olsen and Donovan

82. **Intermediate Shorthand.** Continuation of 81. Must be accompanied

85. **IBM Machine Operation.** Basic principles of IBM accounting, operating features and machine functions of key punch, verifier, sorter, interpreter, reproducing punch, collator and accounting machines. Prerequisite: Introductory Accounting. Two lectures, one lab. (3F, 3W, 3S)  
   Bell

86. **IBM Machine Operation.** Wiring and Operation of accounting machine and reproducing punch. Prerequisite: Applied Statistics 75. Two lectures, one lab. (3W)  
   Bell

87. **Keypunch Speedbuilding.** Three one hour lab periods per week. Prerequisite: One year of typing. (1F, 1W, 1S) Time arranged.  
   Bell

88. **IBM Machine Operation.** Procedure, development, and job planning. Prerequisite: Applied Statistics 76. Two lectures, one lab. (3S)  
   Bell

92. **Business Machines.** Basic training in use of ten-key adding machines, full-keyboard adding listing machines, and rotary calculators. (2F, W, S)  
   Lundstrom; Olsen; Donovan

94. **Key-Driven Calculator.** Practice in addition, multiplication, subtraction, and division on key-driven calculators and application of the machines to such business computations as percentages, discounts, decimal equivalents, and constants. (2F, W, S)  
   Olsen

96. **Ten-Key Bookkeeping Machine.** Application of the ten-key bookkeeping machine to business and financial institutions. (2F, W, S)  
   Olsen

98. **Full-keyboard Posting Machine.** Application of the full-keyboard posting machine to bookkeeping in business and financial institutions. (2F, W, S)  
   Olsen

167. **Office Practice.** Training in use of dictating and transcribing machines, spirit duplicator, mimeograph, mimeoscope. (2F, W, S)  
   Doty

170. **Statistical Typewriting.** For juniors and seniors majoring in business administration, economics, and secretarial science. Practice in setting up charts, tables, and reports. Prerequisite: Sec. Sci. 41, 42, 43, or equivalent. (2S)  
   Lundstrom

175. **Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager; types of organization; methods of control; office arrangement and equipment; job analysis; selection, employment, and training of employees. Prerequisites: Bus. Ad. 1 and 2 and Econ. 51 and 52. (3F)  
   Tezak

179. **Methods of Teaching Typewriting and Bookkeeping.** Recent developments and practices in teaching of typewriting and bookkeeping. Analysis of
objectives and laws of learning, organization of material, texts, standards of achievement, and methods of presentation. (3W) Doty

180. Teaching of Shorthand. Methods and trends in teaching shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3F) Doty

183, 184, 185. Advanced Speed Course in Shorthand. For students who have had at least two years of shorthand and are able to take dictation at not less than 100 words a minute. Emphasis on increasing shorthand speed through speed phrases and reporting shortcuts. Practice in advanced transcription. (3F, 3W, 3S) Doty

186, 187. Secretarial Procedures. Office routines are studied, with special emphasis on use of reference books, transportation and travel, use of telephone, telegraph, and cablegram service, financial records, writing for publication, minutes and meetings. (3W, 3S) Doty

189. Practicum in Business Education. Provides opportunity for planning and development of practical or creative projects in Business Education. Experienced teachers and students who are registered for teacher training, are encouraged to build projects around actual school situations. (1F, W, S) Not taught 1957-58

190. Seminar in Business Education. A reading and research course for junior and senior students majoring in business administration and education problems and literature. (2S) (Not taught 1957-58)

200. Research in Business Education. For senior and graduate students. Time and credit arranged. (F, W, S) (Not taught 1957-58)

ECONOMICS

E. B. Murray, Professor and Head; Vernon Israelsen, Professor; Leonard J. Arrington, Associate Professor; Glenn F. Marston, Assistant Professor.

The Department of Economics offers a program of study leading to the Master of Science degree.

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

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

52. Economic Problems. Continuation of Economics 51. The emphasis in this second course is on the economics of a competitive market; commodity markets and factor markets are analyzed. (5F, W and S) Staff

106. History of Economic Thought. A critical study of the origin and the development of the economic theories of leading thinkers in Western Civilization from 1756 to the present. (5F) Israelsen

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

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

126. Trade-Unionism and the Law. The legal frame-work of the trade union activity: restrictive, permissive, and promotional legislation; the judiciary and labor. (5W) Murray

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

139. Economics of Security Markets. Analysis of organization and operation of stock and bond markets; security speculation; brokerage houses; exchange relations with other institutions; security price behavior; exchange regulation. (3F) Murray

140. International Economic Relations. Basic economic relationship between industrial nations, trade restrictions, international debt and finance and means of promoting progress based on sound economics. Prerequisite: Economics 51, 52. (3F) Staff

143. Economy and Trade of Latin America. Influences exerted by Latin America on world trade. Alternates with Economics 140. (3F) Stall

145. Economics of Consumption. Deals with personal and group expenditure, standards of living, budgets, variations in consumption. (3W) Stall

150. Economic Organization and Development. A study of the types of economic systems in capitalist, socialist, and communist countries; of the theories upon which they are based; and of the alternative methods of promoting economic development. (3S) Arrington


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

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

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

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

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

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

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

205. Price Theory. A critical review of a few major topics in price and distribution theory. Open to graduate students and seniors with adequate preparation. (2F) Murray

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

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

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

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

HISTORY AND POLITICAL SCIENCE

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

HISTORY

Professors Ricks, Brite, Ellsworth.

Students who major in History should complete History 4, 5, 6, 13, 14, and other courses recommended by their particular advisers. History majors intending to pursue graduate study should complete two years of French or German.

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

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

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

6. Recent World Civilization. The cultural history of the world from 1848 to the present. The entire world picture for the past 100 years is presented. (5S) Brite, Ellsworth

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

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

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

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

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

History 21. The Americas to 1763. Geography, pre-Columbian peoples, conquest and colonization by European powers, international rivalries, political, social and economic developments. (3W) Ellsworth
History 22. The Americas since 1763. The eve of the revolutions, the Anglo-American and Spanish-American revolutions, early development of the United States and Latin American republics, Brazil and Canada, their political, social, and economic development, their role in the contemporary world. (3S) Ellsworth

34. English History. English history from the earliest times to the present day. Particularly valuable for English majors and pre-legal students. (5F) Brite

History of Europe

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

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

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

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

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

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

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

History of the United States

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

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

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

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

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

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

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

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

History of Asia

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

Seminar

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

211. Thesis. For graduate students. Time and credit arranged. Staff

229. Seminar. (3F, W, S) Staff

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

POLITICAL SCIENCE

Professors, Merrill, Anderson, Harmon, Olson.

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

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

10. American National Government. The basic course of the department. It is highly desirable that this course be taken before upper division courses in Political Science. (3F, W, or S) Staff

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

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

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

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

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

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

104, 105, 106, 107, 108. Commercial Law. Course 104 studies the law of negotiable instruments; 105 and 106 include study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the law of real property, including estates, deeds, conveying, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108. 107 and 108 will be given in 1957-58, and 105 and 106 will be given in 1958-59. Prerequisites: Political Science 11, 12, 13 or the consent of the instructor. (3F, 3W, 3S) Olson

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

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

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

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

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

128. International Law. A basic course in the law of nations. Students should have had at least one course in international relations or foreign policy. (5S) Roskelley

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

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

140. American Legislation. The course includes a study of the organization and procedure of legislative bodies and the influences at work in and the character of the output of national and state legislature. The laboratory methods of approach are used as far as is feasible. Parliamentary law is emphasized. (3W) Anderson

145, 146, 147. History of Political Thought. No 145 covers political thought from its beginnings in the Greek period to Machiavelli. No. 146 carries on the study from Jean Bodin to Bentham. No. 147 emphasizes the modern period and gives consideration to democratic, fascist, and communist theories. (3F, 3W) Harmon

Students may register for the courses separately.

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

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

203. Readings and Conferences. For senior and graduate students. Time and credit arranged. Staff

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

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

211. Thesis. For graduate students who are preparing a master's degree thesis. Time and credit arranged. Staff
250. Graduate Social Science Seminar. For graduate students in the social sciences. Programs and procedures devised by social science graduate students and department staffs. (1W)

Pre-Legal Program

The University is very interested in students who plan to enter the profession of law. The Institution has been very successful in preparing students to enter professional law schools. The success of these students both in the professional training period, and thereafter, indicates the high quality of the preparation.

Some law schools admit only college graduates. Others admit students with lesser training. College graduation is generally recommended even though it may not be required for admission.

It is recommended that students who plan to enter law school should take the Law School Aptitude Test, several months prior to the time entrance is desired. Many law schools now require that test scores be included in the applications. Applications for the test should be made to the Graduate School Office on the campus.

Below is listed a recommended curriculum for pre-law students. This has been carefully prepared to conform to the recommendations of the law schools themselves. Some modification is possible. Pre-law students should register with members of the political science staff who function as advisers to these students.

Requirements for Pre-Law Majors

American Institutions: P. S. 10 and P. S. 140 are required. Optional selections from the following: P. S. 15, 125, 129, 180, 181, 182.

Total minimum hours 15

Comparative Government: Optional selections from the following: P. S. 70, 75, 126.

Total minimum hours 3

International Relations: Optional selections from the following: P. S. 101, 102, 111.

Total minimum hours 3

Political Thought: Optional selections from the following: P. S. 117, 118, 119, 145, 146, 150.

Total minimum hours 5

Public Law: Optional selections from the following: P. S. 127, 128, 131.

Total minimum hours 5

Areas of Emphasis in Other Departments

The lawyer needs to be familiar with as many areas of human endeavor as possible. It is especially recommended that the pre-law student emphasize the following areas: English, American and European History, English and American Literature, Psychology, and Economics. He should be a skilled typist and familiar with accounting procedures.

Training for the Foreign Service

Students should keep in mind opportunities for a career in the foreign service. The expanding role of the United States in world affairs has increased the demand for well-qualified college graduates, both men and women, in many phases of international work. Foreign service officers appear frequently on the campus to acquaint students with the possibilities of foreign service work. Qualifying examinations are administered at regular intervals at nearby centers.

Educational preparation for the foreign service involves a well-balanced curriculum in the social sciences, arts, and the humanities. Courses in the fields of political science, history, economics, literature, and modern languages should be emphasized. The student may offer a major in any one of a number of fields, but we usually recommend political science or history.

It is especially important that the interested student inform his adviser of his interest in a foreign service career as early as possible in order that course work may be directed toward that end.
SOCIAL SCIENCE

Edwin L. Peterson, Associate Professor.

1. General Social Science. A basic general education course for those interested in a synthesis of the social science disciplines. (5F, W, or S) Peterson

5, 6, 7. General Geography. Europe, Afro-Asia, The Americas. A survey of geography with special emphasis on the social viewpoint. Attention is directed towards the influence of geography on domestic and international problems: cultural, ethnic and linguistic backgrounds will be examined, boundaries, population trends, national economic and governmental systems will be studied as they may reflect foreign policy. Students may register for one, two, or three quarters. (3F, W or S) Peterson

Fall quarter 5 and 6; winter quarter 6 and 7; spring quarter 5 and 7.

SOCIOLOGY

R. Welling Roskelley, Professor and Head of Department; Don Carter, Carmen Fredrickson, C. Jay Skidmore, Therel R. Black, Associate Professors; Evelyn H. Lewis, William A. DeHart, Assistant Professors.

Joseph A. Geddes, Professor Emeritus.

Majors in Sociology must meet the group requirements for graduation. In addition, they are expected to complete a minimum of 47 credits in Sociology distributed in the following fields: General and Historical, 5 credits; Social Organization, 6 credits; Social Problems, 6 credits; Social Psychology and the Family, 6 credits; Social Research and Statistics, 3 credits; Seminar, 6 credits; Cultural Anthropology, 3 credits; Social Work, 9 credits; Population and Industrial Sociology, 3 credits.

Either Sociology 10 or 70 is prerequisite for all upper division courses in Sociology; also Sociology 40 for 140, and 60 for 160.

Master of Science Degree in Sociology

The Department of Sociology offers courses leading to the Master of Science degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies.

Doctor of Philosophy Degree in Sociology

Institutional requirements for the Ph.D degree are explained in the section “Graduate School.” This degree is offered in the Department of Sociology through collaboration with closely related departments in the social sciences.

5. American Culture. Basic beliefs, values, customs, and institutions of the American people. Also a study of governments, educational and other agencies consciously concerned with improvement of American life. (3F) Roskelley

10. Rural Sociology. Background information which will lead to a more enlightened rural and urban citizenry through better understanding of and plans for resolving rural problems dealing with organization, institutions, social processes, and population. (5F, W, or S) Roskelley, Black

40. Social Psychology I. Personality development among social classes and peoples. Analysis of crowds, social movements, social conflicts and other collective behavior; ideologies and institutions. Prerequisite: Sociology 70 or Psychology 53. (3F) DeHart

60. Courtship, Marriage and the Family. Designed to help all students understand the social and emotional factors in personality development, courtship, mate selection, and marriage adjustment. Open to all students. (3F, W or S) Skidmore; Fredrickson; Black; Carter

70. Introductory Sociology. Open to students in all departments. Emphasis upon developing understanding of the social world, and how social ex-
perience contributes to personal development. Sociology 70 or 10 is prerequisite to all upper division classes in sociology and social work. (5F, W, or S) 

75. Effective Community Living. A study of the community and of tools used to understand interpersonal relations within groups and between groups that jointly constitute the community. (5S) Staff

100. Educational Sociology. A study of the group and human relations factors within the school system, and between the school system, the home, and the community. (3W) Black

110. Utah Social Problems. Present-day problems in populations, migration, housing, insurance, manufacturing, temperance, and safety. (3) DeHart

130. Introduction to Cultural Anthropology. Study of the attitudes, ideas, behavior, social organization, and material results of selected primitive and contemporary cultures. (3W) Black

140. Social Psychology II. Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: (Soc. 40. (3S) Staff

141. Rural Community Organization and Leadership. Analysis of forces and procedures at work in developing community organization, with special emphasis on techniques of training leaders to help make the community more effective. (3F) Roskelley

144. Women Today. Women's relation to me, to children, to employment and her perception of herself in her several roles. (3S) Fredrickson

145. Alcoholism. See P. E. 145. (3S) Nelson

153. History of Social Thought. Development of social thought from early periods is traced to August Comte. From this point, important developments in Europe and Americans are studied, with emphasis on American thought. (5S) Roskelley

154. Population Problems. The nature of population growth and decline studied in reference to international, national and local social problems. Significance of present population distributions, characteristics, and trends. (3F) Roskelley

156. Social Institutions. Similarities and differences in life histories of institutions as they emerge, grow, and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. (3) DeHart

158. Human Relations in Industry. Designed to extend understanding of the human or social characteristics involved in the operation of modern industry. The pattern of social relations that affect work behavior will be studied. (3F) DeHart

160. Family Relations. The social-emotional development of the child in the family; marital adjustment; social-culture difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60 (3S) Skidmore

161. Modern Social Problems. An approach based on adjustment to instruments of change as means of minimizing disorganization. (3W) Fredrickson


172. Juvenile Delinquency II. Origin and operation of the Juvenile Court. Detention, probation, placement, and institutional care, as methods of rehabilitation and correction. (3) Staff

174. Introduction to Criminology. Extent and nature of crime, and various factors related to criminal behavior. Theories of crime causation, and methods of prevention and treatment. (3) Staff
180, 181, 182. Current Sociological Problems. For upper division and graduate students. (1F, 1W, 1S) Staff

190. Seminar in Sociology. Time arranged. Required for majors in Sociology. (1F, 1W, 1S) Staff

201. Research in Sociology. For advanced students only. A project for original study is organized, and field work is carried on under supervision. Prerequisite: Soc. 287. (F, W, S) Credit arranged. Staff

202. The Study of Society. Basic principles of sociology are considered in their theoretical and scientific settings, as a body of facts, a method of investigation, and an explanation of associate living. (5W) Black

203. Independent Readings in Sociology. Readings and conferences on topics selected by the student. (F, W or S) Credit arranged. Staff

207. Graduate Seminar. Short subjects within the field of Sociology and pertinent to but not available in regular courses are selected for study. (2) Staff

210. Advanced Rural Sociology. Analysis of major developments in rural social thought, research and application of both toward solution of social problems throughout the world. (3) Roskelley

241. Rural Organization. Social organization in areas larger than the local community; district, state, regional, national and international. (2) Roskelley

262. Instructional Problems in Family Life Education. Methods, materials, and content for teachers dealing with the social, emotional and cultural phases of Family Life Education. (3) Skidmore

263. Marriage Counseling. The philosophy, principles, and techniques of pre-marital and marriage counseling. (3) Skidmore

287. Methods of Social Research. Formulating problems, collecting, analyzing, and interpreting data in social research. (3F) Roskelley

DIVISION OF SOCIAL WORK

R. W. Roskelley, Professor; Evelyn H. Lewis, Assistant Professor, assisted by Sociology staff and other staffs.

Joseph A. Geddes, W. B. Preston, Professors Emeritus.

The demand for social workers exceeds the qualified personnel available for employment. The opportunity in social work is steadily growing, not only because the mounting complexities of modern life bring about an increasing number of personal difficulties, but because methods of constructively dealing with these difficulties are becoming more fully known. As the professional content of positions in social work has become clearer, added emphasis has been given to adequate education and training.

With the establishment of the Council on Social Work Education, in July, 1952, the graduate schools and undergraduate departments of social work joined forces with other segments of the profession to provide for more effective recruitment and training of a larger number of persons for the expanding positions in social work. Undergraduate education in social work is not regarded as a substitute for graduate training, but as the best preparation for employment in those positions for which graduate training is not required, as well as the best preparation for later undertaking graduate study in social work. More than 60 undergraduate departments of social work have been approved by the Membership Committee for constituent membership in the Council on Social Work Education, of which this department is a charter member.

Course requirements for a major leading to a B.S. degree in social work are: S. W. 165, 173, 175, and S. W. electives, 12 hours; Economics 127; Political Science 129; Psychology (9 hours selected from:) 105, 121, 123, 140, 161, 183; Sociology (12 hours selected from:) 130, 141, 160, 161, 170, 172; Child Development 67.
During the freshman and sophomore years, students should take the following courses, in addition to filling the general group requirements for graduation: (Most of these courses may be applied towards the Social Science group requirement) Economics 51; Political Science 1 or 10; Psychology 53; Sociology 10 or 70, 40.

50. Social Welfare Agencies. An introductory study of the agencies and institutions which provide social services such as child welfare, family counseling, school social work and public assistance. (3W) Lewis

162. Mental Hygiene. Social and cultural changes that have given rise to problems of adjustment. Reactions to stress: "preventive" growth and adaption. (3W) Lewis

165. Culture and Personality. The process of personality development, with emphasis on the influence of culture, social class, and the nature of personal experience. (3F) Roskelley

173. The Field of Social Work. Contemporary social work as it is divided into the following areas of activity: social casework, social group, community organization and social action. Objectives, processes, and personnel requirements of social work agencies. Social Work majors should take S. W. 175 concurrently and whenever possible, S. W. 173 prior to other S. E. classes. (3F) Lewis

174. Introduction to Case Work. Theories and practices of social case work, with emphasis on problems and techniques of interviewing. (3W) Lewis

175. Introduction to Field Work. Acquaints students with various agencies dealing with social work and related areas, includes field trips. Should be taken concurrently with S. W. 173 (2F) Lewis

177. Social Treatment of Children's Problems. Analysis and treatment of problems of children. (3F) Lewis

178. Adolescence. Social adjustment of the adolescent, as influenced by the nature of the culture in which he lives. Methods of working with adolescents. (3S) Lewis

180. The Dynamics of Groups at Work. Group process are studied from the point-of-view of improving group development and effective leadership and individual participation in groups. Social action as a group process will be given special attention. (3S) Lewis


195. Social Work Seminar I. A study of social work publications and other source material applicable to the field. Required of majors in Social Work. (1) Lewis

203. Independent Readings in Social Work. Readings and conferences on topics selected by the students. (F, W, S) Credit arranged. Staff

200. Social Case Work I. Principles and methods of social case work. Investigation, diagnosis, and treatment. (3F) Lewis

240. Community Organization. Processes operating in rural and urban communities and development of means for co-ordinating them. (3W) Lewis

250. Public Welfare Services I. Analysis of the operation of a modern public welfare services program, including: public assistance, social security, public services for children. (3F) Lewis

270. Child Welfare. Evolution and current developments in programs for meeting needs of children. Consideration is given to substitute parental care and adoptions, to child labor laws, juvenile courts, to problems of the child of unmarried parents, and the handicapped and the exceptional child. (3S) Lewis

COLLEGE OF EDUCATION

Teacher Placement Service ................................................................. 130
Teacher Certification ................................................................. 131
Education .............................................................................. 131
   Teacher Education .......................................................... 131
   Graduate Programs in Education ........................................ 135
      (Administration, Elementary, Secondary)
Fine Arts ........................................................................... 137
Visual Arts ........................................................................ 137
Drama ................................................................................. 140
Music ..................................................................................... 142
Library Science .................................................................... 145
Health, Physical Education and Recreation ....................... 146
Psychology and Guidance ..................................................... 154
The College of Education includes the departments of Agricultural Education; Education; Fine Arts; Library Science; Health, Physical Education and Recreation; and Psychology and Guidance. The department of Fine Arts provides for graduation majors in art, music and drama. Most of the other departments in the College of Education provide for similar variable majors. A primary function of all the departments, however, is the preparation of teachers, administrators, supervisors and other professional personnel for the public schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments in the University.

The Bachelor of Science degree, with a major in elementary or in secondary education, is designed for students preparing to teach in elementary or in secondary schools. Students majoring in other departments of the University who wish to prepare for teaching are admitted to the teacher education curricula upon formal approval of their application by the Admissions Committee of the College of Education. Subsequently, they are assigned an adviser in education who cooperates with the adviser in the student's departmental major.

The University offers complete programs of teacher education in all phases of public school work. Facilities for student teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Family Living and Child Development in the College of Home and Family Living, is especially concerned with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts and Technology do their student teaching under the direction of the departments concerned in selected schools throughout the state and under supervision of University supervisors.

To serve as a laboratory in the preparation of kindergarten and general elementary teachers, the University has its own elementary school, the Edith Bowen School, located on the campus. It includes kindergarten and grades one to six inclusive. The teachers in the school, selected especially for their fitness to serve in the teacher education program, are regular members of the University faculty. The Edith Bowen School, in addition to its function as a center for teacher education, serves the College of Education as a laboratory in which child growth and development is studied and desirable school practices are developed.

Students preparing for general secondary certificates do their student teaching under the direct supervision of selected teachers in nearby junior and senior high schools. The University maintains contractual arrangements for these services. Students in elementary education also do part of their student teaching in selected public schools.

On the graduate level, as indicated in subsequent statements concerning each department, programs are offered for students who desire to meet requirements for administrative, supervisory, or other advanced professional certificates. The M. S., the M. Ed., and the Ed. D. degrees are offered.

The College of Education is a member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education.

TEACHER PLACEMENT SERVICE

The University is interested in placing its graduates in professional positions. To accomplish this purpose in the College of Education, the teacher placement service has been organized. All students who qualify for teaching or other professional certificates are required to register with the bureau to facilitate the compilation of the proper credentials to be used in placement for the current and future years. Registration should be completed in the winter quarter or early part of the spring quarter.
COLLEGE OF EDUCATION

TEACHER CERTIFICATION

The College of Education is designated by the Utah State Department of Public Instruction as its official representative in administering certification requirements for regular students of the University.

The University provides training to prepare the students for any of the professional certificates issued by the Utah State Department of Public Instruction.

Specific requirements for each certificate may be obtained from the office of the Dean of the College of Education or from the department in which the major work is offered.

DEPARTMENT OF EDUCATION

John C. Carlisle, Professor and Head of the Department; LeRoy A. Blaser, Ellyert Himes, E. A. Jacobsen, L. G. Noble, Professors; Caseel D. Burke*, Eldon Drake, Basil Hansen, Edith S. Shaw, Associate Professors; Pearl S. Budge, Terrance E. Hatch, Gene S. Jacobsen, W. P. Lewis, Jean Pugmire, Assistant Professors; Evelyn Wiggins, Thomas A. Taylor, Ivan Pedersen, Beatrice E. Murray, Francine Wiggins, Bee Roberts, Alice Olsen, Instructors.

The Department of Education is organized into two main subdivisions—Teacher Education and Graduate Programs.

TEACHER EDUCATION

The subdivision of teacher education offers programs of study leading to the Bachelor of Science degree in the fields of elementary and secondary education and to completion of certification requirements for teaching in the elementary and secondary schools of Utah. Students working toward the degree in either field should plan their courses of study with the guidance of their faculty advisers.

The Program in Elementary Education

To obtain the Bachelor of Science degree in elementary education and qualify for the Utah teacher's certificate for elementary schools the following minimum requirements must be met:

(1) Courses designed to provide a broad liberal background. These must include a minimum of ten credit hours in each of the four basic fields of knowledge: biological science, physical science and mathematics, language arts, and social science. In addition, six credit hours must be earned in the fine and/or practical arts.

(2) Thirty credit hours in one field of concentration, or 18 credit hours in each of two such fields. These fields of concentration should be related as closely as possible to curriculum areas of the elementary school.

(3) A major of 45 credit hours in professional study selected from the following divisions:

Group I Understanding the Child—Minimum, 9 credit hours:
- Psychology 100*, 123, 145, 183, Physical Education 84,
- Public Health 155*, Speech 167, Child Development 67, 68,
- Psychology 105.

Group II Understanding the School—Minimum, 6 credit hours:
- Education 103*, 114*, 141, 182.

Group III Curriculum and Methods—Minimum, 12 credit hours:
- Education 104*, 105*, 108, 109, 110, 161, Psychology 108*, 112,

Each student will be expected to take the following courses or in lieu thereof to demonstrate acceptable ability in the fields represented: Education 107, English 122, Music 150, Art 152, Physical Education 177.

*On leave.
In planning his course of study, a student should be guided by his major professor.

A student who wishes to qualify for elementary certification in addition to completing his secondary requirements must have completed a minimum of fifteen (15) quarter hours of professional education courses specifically listed for elementary teachers including: Elementary School Curriculum (Educ. 104), Student Teaching (Educ. 106a), and additional courses selected from: Education 105, 107, 108, 109, Psychology 108, English 122, Speech 118, Music 150, Art 152, and Physical Education 182.

The Program in Secondary Education

In obtaining the Bachelor of Science degree in secondary education and to qualify for the Utah teacher's certificate for secondary schools the following minimum requirements must be met:

1. Completion of the University Lower Division requirements, including those in the four basic groups—biological science, exact science, language and arts, and social science.

2. Completion of a teaching major of not fewer than 36 credits, of which 15 credits must be Upper Division, and a teaching minor of 20 credits. The major and minor must each be in a specific subject taught in Utah secondary schools. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not fewer than 60 credits in two or more related subjects taught in secondary schools, with a minimum of 18 credits in any subject in the composite major. Lists of courses recommended for teaching majors, minors, and composite majors are available at the department office.

3. Completion of the 33 credit hours required for the Utah teacher's certificate for secondary schools. The professional courses are to be taken within the following divisions:

- **Group I** Understanding the Pupil—Minimum, 9 credits: Education 113, Psychology 100*, and 102*, 105, 123, 140, 145, 202, P. E. 84.

- **Group II** Understanding the School—Minimum, 6 credits: Education 111*, 114*, 141, 182.

- **Group III** Student Teaching, Methods & Curriculum—Minimum, 15 credits:
  
  Education 127*, 129*, 130*, 161. A maximum of 5 credits in the following special methods classes may be counted in completing the 15 credit requirement in this Group or the total of 33 credits in professional courses, if taken in the field of one's teaching major or minor: Art 151, English 124, Music 151-152-153, Speech 123, Secretarial Science 179 or 180, Physical Education 120, Mathematics 150, Education 110.

- **Group IV** Public Health 155*.

Students majoring in other departments of the University which offer teaching majors in general secondary education must complete the requirements outlined above. Such students are advised to apply to the Department of Education for admission to the teacher education program as early as possible in their college careers.
50. Introduction to Teaching. A study of the requirements for becoming a teacher and of the values of teaching as a profession. Experience in the course will assist each student to evaluate his potentialities for teaching and will assist the Department in selective admission of candidates for the teacher education program. Required of all candidates for the teacher education curricula. (2F, W, S) Staff

103. Principles of Elementary Education. An introduction to the elementary school; its background and development, philosophy, personnel, practices, achievements, and its place in the American system of education. (4F, W, S) G. Jacobsen

104. Elementary School Curriculum. Familiarizes prospective elementary teachers with the nature and content of the elementary curriculum and factors that influence its development. Includes an introduction to the teaching guides for Utah elementary schools, and considers some of the objectives, methods of instruction, teaching aids and materials, and sources of information related to the subjects of the curriculum. (5F, W, S) Pugmire

105. Principles of Teaching in the Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. Significance of individual differences in application to schoolroom practices. Consideration of classroom organization, equipment, and play activities. To be taken concurrently with student teaching. (3F, W, S) Shaw-Pugmire

106. Student Teaching in the Elementary School. For juniors and seniors who have had a substantial amount of professional course work including Principles of Elementary Education, Educational Psychology, and Elementary School Curriculum. The apprentice plan is followed which requires an initial period of observation with minor responsibilities but with gradual increase of work and responsibility as the student's ability is demonstrated. Registration for all quarters should be arranged at fall quarter registration. Students who have credit for other courses in student teaching, or who have successful teaching experience, may register, by special permission of the instructor, for less than twelve credits. (12F, W, S) Shaw, Pugmire, and Supervising Teachers

106a. Student Teaching in the Elementary School. For experienced teachers or individuals who have completed requirements for the secondary certificate and are preparing also for elementary. At least one-half day for one full quarter is required. The student will be assigned to a sponsor teacher in the campus laboratory school or in the public schools. Education 136 must be taken or audited concurrently. (5F, W, S) Pugmire and Supervising Teachers

107. Teaching of Reading. Considers the objectives of the reading program, stages of reading development, skills and attitudes to be gained, the materials of instruction, and the experiences of children that contribute to the achievement of the objectives of reading. Opportunities for observation of reading situations in elementary school classrooms. (3F, S) Shaw

108. Social Studies in the Elementary School. Modern practices in organizing the elementary curriculum to provide social studies experiences for children consistent with the nature of the child and the democratic society in which he lives. (3W) Lewis

109. Arithmetic and Science in the Elementary Grades. Investigation of the aims of the arithmetic and science programs and an acquaintance with the materials, techniques of instruction, and experiences that may help children gain the skills, understanding, and attitudes desirable in these subject areas. (3S) Staff

110. Diagnosis and Treatment of Learning Difficulties. A study of methods of dealing with learning difficulties in basic educational skills of pupils in the elementary and secondary schools. The emphasis is upon developmental and corrective measures in the typical classroom. Recommended after student teaching. (3F, W, S) Stone

111. Principles of Secondary Education. The background and status of the American secondary school. Problems concerning desirable objectives and functions are analyzed. An introduction to various type curricula and methods is included. (5, F, W, S) Carlisle and Drake
113. Principles of Guidance. Major emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3F, W, S) Hatch

114. Organization and Administration. Fundamental principles of operating public schools, with emphasis on Utah conditions. (3F, W, S) Hansen, Lewis

118. Social Studies in the Secondary School. A special methods course for secondary school teachers with teaching majors or minors in any of the social sciences. (3F) Lewis

119. Extracurricular Activities. Designed to acquaint prospective teachers and administrators with extracurricular programs in secondary schools, and the place such activities occupy. (2S) Drake

124. The Teaching of English. This course considers what research says about methods of teaching English and what the content of the language arts program should be. It also includes a review of some fundamentals. (4W) Budge

127. Secondary School Methods. Teacher personality, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, testing, and evaluation are all included. Recommended to be taken the same quarter with Education 129. (3F, W, S) Budge, Hatch

129. Student Teaching in the Secondary School. This course must be taken during the same quarter as Education 127 and should be taken concurrently with Education 130, thus making a block of twelve credits to be completed in one quarter. The student should reserve all morning or all afternoon in his daily schedule for these courses.

Application for admission to student teaching is made the preceding quarter, and students may enroll only if their application has been approved. Applications will be approved only if the student has completed Education 111 and Psychology 100 and 102. Members of the class are assigned to a sponsor teacher in nearby secondary schools for student teaching in their major and minor subjects. A brief period of observation is followed by gradually increasing responsibilities until upon completion of the quarter, the student has had guided experiences in all professional responsibilities of the typical faculty member in the secondary school. (5F, W, S) Hatch, McClellan, Budge

130. Student Teaching in the Secondary School. See 129 above. (4F, W, S) Hatch, McClellan, Budge

131. Student Teaching. Student teaching at the junior college level. Enrollments by special permission only after the student has successfully completed Education 129. Designed for graduate assistants, laboratory instructors and others with substantial teaching assignments who wish to qualify for certification. (4W, S) Staff

132. Curriculum for the Mentally Handicapped. A study of curricula and adaptations in methods of teaching especially suited to the needs and patterns of abilities of mentally retarded children. The course should provide helpful guidance both for teachers of special classes for these children and for teachers who provide for them in "regular" school classes. Psychology 123 is a prerequisite or should be taken concurrently. (3W) Sharp

133. Curriculum and Methods for Kindergarten. The course will deal with purposes and procedures in kindergarten education. Class members will spend some time observing the kindergarten demonstration school on campus. (3F) Pugmire

136. Improving Instruction in the Elementary School. An analysis of the newer concepts of method and of the basic factors which contribute to effective learning. Motivation, problem solving, laboratory techniques, and materials of learning will receive attention. (3W, S) Pugmire

138. Improvement of Teaching in Secondary Schools. Designed to meet the needs of teachers, supervisors, and administrators. Emphasis upon recent developments in the improvement of teaching learning situations and activities from the junior high school to the junior college with special attention to core curriculum. (3S) Budge
141. Social Foundations of Education. The implications for education involved in social conditions and social change. The social significance of current educational theories and practices. (3W) Lewis

156. Student Teaching in Special Education. The area of specialized training for this course is with the mentally handicapped child and is designed to help the teacher apply methods and techniques found to be successful with slow-learning children. The apprentice plan is followed which requires an initial period of observation with minor responsibilities which increase as the student's ability is demonstrated. Enrollment is limited to experienced teachers or students who have completed Education 106. Students enrolled in the class will also be expected to have completed or be concurrently taking the course in Psychology 123, Psychology of Exceptional Children, and Education 132. Curriculum for the Mentally Handicapped. (5F, W, S) Sharp

161. Audio-Visual Aids in Education. Studies the building of a workable program in which the newest materials and techniques are utilized. Preparation of audio-visual material included. (3F, W, S) Drake

182. History of Education. Major educational movements from early Greek to the present with emphasis on purposes, organization, instructional procedures, curriculum, etc., and their bearing on today's education. Lewis

Special methods courses in Secondary Education

Teaching of Typewriting and Bookkeeping. (See Secretarial Science 179)

Teaching of Shorthand. (See Secretary Science 180)

Teaching of Physical Education. (See special methods courses in Physical Education.)

Teaching of Art. (See Art 152)

Teaching of Math. (See Math. 150)

Teaching of Music. (See special methods courses in music)

**GRADUATE PROGRAMS IN EDUCATION**

(Administration, Elementary, Secondary)

Requirements for graduate degrees in Education are included with the statement of the Graduate School on page 72. Detailed descriptions of the programs of study leading to these degrees are available at the office of either the Dean of the School of Graduate Studies or Dean of the College of Education.

202. Philosophy of Education. An analysis of the major philosophies of education and their implications for current educational practices. (3F) Lewis

203. Comparative Education. A study of the school system and educational problems of Europe, Latin America, the Middle East, Far East, and Russia. Students from foreign lands and resident faculty members personally acquainted with various educational programs are utilized as resource persons. (3W) Lewis

204. Elementary School Curriculum. An advanced course in elementary school curriculum for graduate students including experienced teachers, supervisors, and administrators. (3W) G. Jacobsen

205. Reading and Conference. Provides for individually directed study in subjects of one's special interest and preparation. (1-2F, W, or S) Staff

207. Elementary School Administration. The operation and management of the modern elementary school. (3F) G. Jacobsen

208. School Supervision. The principles and practices of school supervision including the qualifications and responsibilities of supervisors of instruction. (3F) G. Jacobsen

213. Organization and Administration of Guidance. (See Psychology 213). (3S) Wright

215. Secondary School Curriculum. A study of the secondary school curriculum, junior and senior high school, as it now exists in typical schools, with special reference to Utah. (3F) Hatch

217. The Junior High School. A study of the junior high school as a distinct segment of the American public school system, its functions, organization and curriculum with special emphasis upon the core curriculum and common learnings. (3W) Hatch

218. Public Relations in Education. Objectives and techniques and media for an improved school public relations program are listed and evaluated. (3F) Jacobsen

221. School Administration. The work of the school administrator and the principles upon which the profession of school administration is practiced. Federal state, and local relations to education are studied. (3F) Hansen

223. Legal Aspects of School Administration. Emphasis is given to responsibilities and functions of local and district school administrators with interpretation of legal status, form and procedure as established by statutes, legal opinions, and court decisions. (3W) Lewis

236. Secondary School Administration. Topics in secondary school administration are considered, including problems of teacher-pupil personnel, the principal as supervisor, and managing the activity program. Designed for experienced school principals, and those preparing for the administrator's certificate in secondary education. (3W) Carlisle

237. Problems in Secondary Education. For graduate students in secondary education and those preparing for school administration or supervision in the junior or senior high schools. Reviews current research in areas of special interest to class members. (3W) Carlisle

245. Problems in Elementary Education. Consideration given those fields of elementary education that members of the class desire to investigate in order to gain modern authoritative viewpoints. Opportunity for both individual and group work. (3W) G. Jacobsen

246. Problems in School Administration. The class has two purposes: (1) to assist students with the completion of graduate research problems in school administration; and (2) to serve as a seminar in school administration in which current problems in the field are analyzed. (3W) Staff

247, 248, 249. Education Seminar. Opportunity for investigation and report of individual problems and for group discussion and criticism on these reports. Minimum of one quarter required of all Education majors. (1F, W or S) Hansen

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. Prerequisite, Psychology 112. (3F) Carlisle

271. Research and Thesis Writing. Individual work in thesis writing with necessary guidance and criticism. Credit arranged. (F, W or S) Staff

281. School Finance. The importance of finances in a school system; principles and practices involved in collecting and distributing school revenues, with special reference to conditions in Utah. (3F) Jacobsen

299. Internship in School Administration. The course provides introductory experiences in school administration. The student will be assigned for a minimum of five hours weekly to work under the direction of an administrator in the public schools, either elementary or secondary, according to the student's goal. (F, W, S) Credit to be arranged. Staff
302. Readings in Foundations of Education. The course will deal with current problems of education in terms of their sociological, historical, and philosophical foundations. For advanced graduate students. Enrollment on consent of the instructor. (3W) Jacobsen


322. Administration of School Personnel. Principles and practices in management of teacher and pupil personnel. (3S) Jacobsen

342. Higher Education. A study of the development and current status of "education beyond the high school" in America with special emphasis upon the role of the Junior College. (3S) E. A. Jacobsen, Himes

355. School Building Programs. School housing surveys, location and capacity of schools, instructional needs as a basis for planning, standards for equipment, checking plans and specifications, business and legal provision governing financing and construction of new buildings, bids and contracts. (3S) G. Jacobsen

375. Field Studies and Thesis. Individual work on research problems applying on the program of the Ed. D. Credit arranged. (F, W, S) Staff

382. School Business Management. An intensive study of the factors involved in the efficient business management of school systems and individual schools. For school administrators, clerks, and students preparing for these positions. (3W) Staff

FINE ARTS

Twain Tippett, Associate Professor and Head of Department.

The Department of Fine Arts, comprising the subdivisions of Drama, Music, and Visual Arts, has a three-fold purpose. It is designed to offer rewarding contact with the arts to the college and community at large through experience as viewers, listeners or participants in a variety of exhibitions, dramas and concerts. It serves to prepare students as teachers of the arts in the elementary and secondary schools, and as participants in other professional endeavors in the field of fine and applied arts. Graduate studies, designed both to deepen artistic insight and to qualify students for the Master's Degree and advanced professional positions, are also available.

VISUAL ARTS

Floyd V. Cornaby, H. Reuben Reynolds, Professors; Jessie Larson, Everett Thorpe, Associate Professors; Harrison Groutage, Gaell Lindstrom, Assistant Professors.

The subdivision of Visual Arts serves three functions:

a. To the student body in general it offers:
   1. Courses which meet requirements in the field of language arts.
   2. Elective courses designed to increase appreciation of art and to satisfy avocational interests in the field.

b. Service courses are provided to other schools, departments and divisions of the University, particularly to majors in Home Economics, Industrial Design and Landscape Architecture. Advisers in those fields should direct their majors to appropriate courses.

c. Curriculums leading to the Bachelor's or Master's degree in Art Education or in Applied Art are provided. In the field of Art Education majors and minors may select specialization in Elementary Art or Secondary Art. In the field of Applied Art they may select specialization in Commercial Art, Crafts, Drawing and Painting, General Art or Interior Decoration. Majors in Art Education must choose a minor in
a department other than Art. (This is also recommended for majors in Applied Art.)

The subdivision of Art reserves the right to retain student work for temporary or permanent exhibition.

A list of detailed requirements and course sequences in the various curriculums may be obtained from the department office.

**Art Appreciation and History**

1. Exploring Art. Aims to increase enjoyment of living through the sense of sight. Develops understanding of basic principles underlying the visible forms of art in everyday life. (3F, 3W, 3S) **Staff**

2, 3, 4. Art History. This three-quarter series offers art majors a thorough survey of the lasting contributions of each major art movement. Artists and their enduring works are discussed and observed through extensive use of visual aids. Primitive, classical, medieval, renaissance, neoclassical, the important schools of modern art and contemporary works are treated. (3F, 3W, 3S) **Reynolds**

101. Art History of the Western Hemisphere. Stresses the great contributions of the Indian cultures of Latin America and the Spanish Colonists in painting, sculpture, and architecture. (3S) **Cornaby**

**Basic Design**

5. Beginning Design. Design relates to the meaningful organization of art elements. This beginning course introduces the basic art elements and comprises projects largely in two dimensions. Class meets 3 hours twice a week. Required of all art majors. (3F, 3W, 3S) **Staff**

6. Advanced Design. A continuation of Art 5 and three-dimensional projects are emphasized. The important element of color is also stressed. (3W) **Lindstrom**

7. Design Projects. An individually creative approach to design is the function of this course. A great variety of exciting design possibilities are explored in a wide variety of mediums. Art 5 and 6 are prerequisites. (3S) **Lindstrom**

135. Color. Color as a design element in stage lighting, painting and everyday living are the concern of this course. Physical, psychological and artistic aspects are correlated. Suited to the businessman, layman, dramatist, artist, and teacher, as well as, painters. (3S) **Reynolds**

**Art Media**

8. Basic Drawing. An individually creative approach to drawing natural forms from observation and memory. Various media are used. Prerequisite to all painting courses. (3F, 3W) **Larson; Lindstrom**

9. Anatomy for Artists. Analysis of bone and muscular structure of the body with emphasis on surface characteristics. (3W) Prerequisite to life drawing. **Groutage**

14. Introduction to Painting. Introducing basic approaches to painting which develop freedom of expression. Tempera and related media. Recommended prerequisite to all other painting courses. (3F) **Larson**

27, 28, 29. Art Photography. (3F, 3W, 3S) **Reynolds**

104. Life Drawing. From anatomical rendering to the analysis of the drawing in relation to creative composition. (3S) **Groutage**

105. Advanced Drawing and Composition. Special attention is given to drawing several objects in strong compositional designs. (3S) **Thorpe**
106. Perspective and Rendering. Principles of perspective and styles of rendering are presented for landscape architecture and art students. (3W) Reynolds

109. Landscape. Various approaches and techniques in painting — outdoor sketching, oil and related media. (3F, 3S) Larson

111. Water Color. (3S) Lindstrom

112. Portrait Painting. The contemporary study of the functions and form problems of portrait painting in terms of the principles of value, plane, line, texture, color and design. Any media may be employed. Prerequisite, Art 6. (3W) Groutage

125. Print Making. Such methods as block printing, wood cuts, silk screen, and etching are studied. Desirable preparation, Art 8. (3W) Groutage

127. Oil Painting. A basic course for students beginning to paint in oils. (3W) Thorpe

160. Sculpture. Creative expression in a variety of plastic media. Emphasizes aesthetic employment of form and the technique necessary to casting, built-up plaster modeling, beating metals, stone cutting, and wood carving. (3S) Groutage

**Functional Design**

21. Lettering Layout. Elementary and advanced pen and brush lettering. (3F, 3W, 3S) Thorpe

40. Essentials in Interior Design. Study of historic styles and the analysis of art elements and principles of design applied to home planning and furnishing. (3F, 3W) Larson

115. Fabric Design: Projects in creating design of character and beauty and applying them to suitable textiles in techniques of block print, stencil, and hooked rug, creative embroidery, silk screen printing, freehand painting, and batik. Desired prerequisites: Art 5 and 6. (3S) Larson

116. Ceramics. This course stresses the fundamental processes of making well-designed ceramic objects. (3F, 3W, 3S) Groutage; Lindstrom

117. Art Metal and Jewelry-Lab. Art Metal projects in hand-wrought copper, and silver, jewelry design and construction, precision casting. (3F, 3W, 3S) Cornaby; Lindstrom

118. Leathercraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles, and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (3F, 3W, 3S) Cornaby

121. Advertising Design and Illustration. Elementary and Advanced Fashion Illustration, art for reproduction, advertising layouts, techniques and skill in any media that will prepare the student for a professional career. (3W) Thorpe; Groutage

140. Applied Interior Design. Practical application of art elements and principles of design to problems of home decoration and furnishings (3S, 3W) Larson

141. Advanced Problems in Interior Design. Experimental projects in home planning and furnishing. (3S) Larson

**Art Education**

50. Art for Young Children. Designed to meet needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3S) Larson

151. Art Methods for Elementary Grades. Methods of teaching drawing, painting, design and handwork in the elementary schools. Required for preparation of a grade school teacher. Prerequisite: Art 5 and 6 or 14. (3S) Reynolds
152. Art Methods for High School. Methods of Teaching art in high
school. How to motivate work in drawing, painting, design, and crafts. Re­
quired of all majors and minors in art on secondary teaching level. Prereq­
uisites: Art 5 and 6 or 14. (3W) Lindstrom

Art 171 and 271. Special Studio Courses. Individual work in any one or
more of following, as approved by the instructor concerned. Time and credit
arranged. Design Studio, Painting Studio, Printmaking Studio, Sculpture
Studio, Experimental Media Studio, Crafts Studio. (F, W, S, Cr. Arr.)

Graduate Study
272. Art Research, Seminar and Thesis Problems. Time and credit ar­
 ranged.

Floyd T. Morgan, Associate Professor; W. Vosco Call, Assistant Professor.
The undergraduate curriculum and theatre activities in Drama are de­
signed for students who desire to prepare themselves for teaching careers in
Dramatic Art, for students who wish to specialize in Drama and for those who
wish to prepare themselves for advanced study in Drama and Theatre.

Forty-five to fifty credit hours of work in Drama, Speech and dramatic
literature are required for the teaching or non-teaching major in Drama. A
detailed list of requirements may be obtained from the department office.

Special curricula may be arranged for students who wish to take a com­
posite major combining courses in Drama with work in another department
or division as Speech, English, Art, Music, Physical Education, etc. Sixty cred­
it hours are required for the composing major. Ordinarily a composite major
can be completed in four college years. Students who desire to complete a
composite major in Drama and another division or department should work out
their programs with advisers assigned to them by the heads of the depart­
ments concerned.

For the minor in Drama a minimum of eighteen credit hours is required
including three hours in Drama 1. Other courses to meet the needs of the
student are to be selected with the aid of an adviser.

An important activity of the Drama Division is the Utah State Theatre
which produces several plays each year. Drama students participate in the
various departments of a production—acting, directing, staging, lighting
and managing.

Graduate Study

The Drama subdivision of the Department of Fine Arts offers advanced
study and research leading to the Master of Science degree.

Courses Offered

History and Appreciation Courses

1. Understanding Theatre. A course designed to develop appreciation for
theatrical entertainment through learning the contributions of playwrights,
actors, directors, designers, technicians, and theatres. Readings, recordings,
pictures, and actual performances are utilized. (3F, 3S) Morgan

2. Current Drama. Plays and musical comedies currently being presented
in world theatrical centers are studied and new innovations in theatre produc­
tions are considered. (3W) Staff

10. Drama Appreciation. A study of dramatic forms, tragedy, comedy,
melodrama, and theatrical styles such as, realism, symbolism and expres­
sionism. (3W) Staff

100, 102, 104. Masterpieces of Theatre. A study of plays as presented
in the theatre. Greek, Roman and Medieval religious plays in the fall quar­
ter. Winter quarter, plays from the renaissance to Ibsen are considered.
Modern European and American dramas are treated in the spring quarter.
(3F, 3W, 3S) Staff
106. Motion Picture and Television Appreciation. An analysis of cinema and Television attendance at “Film Festival” and selected movies required. Outstanding telecasts are assigned and discussed. (2F, 2W evening) Tippetts

130. History of the Theatre. An historical survey of the evolutionary processes in the theatre from ancient to modern times. Actors and acting methods, stages and production effects etc. are considered. (3F) Staff

160 Playwriting. Analysis of dramatic structure and technique as encountered in play directing, dramatic literature or in the writing of original plays. (3W) Morgan

Performance


44. Fundamentals of Acting. Theory and practice of the basic concepts of the art of acting. (3F) Call

46. Intermediate Acting. A continuation of Drama 44 with emphasis on characterization and the development of the actor's physical, mental and emotional resources. (3W) Staff

144. Advanced Acting. Emphasis on the creative approach to acting, analysis and creation of the roll and ensemble playing. (3S) Staff

124. Theatre Workshop. Limited credit is given for participation in Utah State Theatre plays. Rehearsal and production staff work arranged. Consult instructor for permission to register. (1-6F, 1-6W, 1-6S) Staff

146. Directing. Theory and practice of the principles of stage directing. Students select, cast, direct and present one-act plays. (3S) Staff

132, 134, 136. Private Instructions. Individual tutoring to develop competence in acting, directing, scenic and costume design. Special fee. May be taken from one to three quarters. (F, W, S, credit and time arranged.) Staff

Production Staging

50. Stagecraft. Technical organization and planning of the production, building, rigging, and shifting of scenery and construction of properties. (2W, 2S) Morgan

52. Makeup. Practice and theory of straight and character makeup for the stage. One two hour laboratory period per week. Recommended for prospective directors of school, church, and community theatricals. (1F) Morgan


56. Puppetry. The design, construction, and manipulation of puppets. Recommended particularly for elementary teachers. (3W) Reynolds

105. History of Costume. Shown social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. (College of Home and Family Living) (3F) Staff

150. Scene Design. Application of basic principles of design to the stage setting. Development of the scenic design through color sketches, plans, elevations and models. History of stage decoration and some painting techniques. (3F) Morgan

152. Stage Costuming. Fundamentals of pattern drafting, construction of stage costumes and accessories, organization and care of costume wardrobes. (2S) Staff
154. Stage Lighting. Study and application of the principles of stage lighting. Practice in planning the lighting and in mounting and operating lighting equipment. (2W) Staff

156. Theatre Organization and Management. Study of the managerial aspects (organization, promotion, financing) of the education and community theatre. (2W) Staff

190. Problems in Drama. Selected research problems of merit and of mutual interest to students and instructors are investigated. Consult instructor for permission to register. (F, W, S) (time and credit arranged) Staff

192. Projects in Theatre. Advanced work in acting, directing, scene design, costume design, costume construction, lighting, technical practice, make-up and theatre management. Projects may be done in connection with Utah State Theatre productions or they may be independent endeavors. A total of 9 credits may be earned in this course. By permission of instructors. (F, W, S) (Time and credit arranged.) Staff

194. Problems of Drama Directors. Play selection, organization of the production, drama club activities, simplification of settings, lighting, and costumes, financing, auditorium and stage facilities, central staging, audio-visual aids, and bibliography are studied. Recommended for directors and prospective directors of high school, church, and community theatres. (3 to five credits, S evening) Morgan

200. Seminar in Drama. Intensive study of special problems in the fields of drama and theatre. (F, W, S) (time and credit arranged) Staff

202. Research Studies. Advanced research in drama and theatre. By permission of instructors. (F, W, S) (time and credit arranged) Staff

204. Thesis. (Time and credit arranged) Staff

292. Advanced Projects in Theatre. Project work at the graduate level in any of the branches of theatre art. By permission of instructors. (F, W, S) (credit and time arranged) Staff

MUSIC

Walter Welti, Professor; A. L. Dittmer, Andrew J. Galos, Irving Wasserman, Associate Professors; Max F. Dalby, Assistant Professor; George Pahtz, Instructor.

The subdivision of Music serves three functions:

a. To provide courses for the general student body which meet lower division or general education requirements in Language Arts.

b. To provide courses beyond the above for students wishing to increase their understanding and appreciation of music or to develop their particular skills.

c. To provide specific sequences of courses leading to the Bachelor's and Master's degrees in music and music education.

Specific requirements and recommended course sequences for degrees in music may be obtained from the departmental office.

History, Appreciation, and Literature

1. Enjoying Music. Designed to increase understanding and enjoyment of music through studying and hearing selected compositions in all musical forms (meets Language Arts requirements). (3F, 3W, 3S) Welti

101, 102, 103. Music History and Literature. This is a basic course for music majors and those desiring a thorough background in music. It stresses music in general culture; the place of music in history and the relationship of music to the other arts. Fall quarter covers from antiquity to Handel. Winter quarter covers from Bach to Beethoven. Spring quarter covers from Schubert to the contemporary composers. Required of all music majors and minors. (Music 1, recommended as a prerequisite.) (2F, 2W, 2S) Wasserman
180, 181, 182. Piano Literature. Music written for the piano from its earliest composers to Mozart will be studied fall quarter. Piano music from Beethoven to early Romanticists winter quarter; and spring quarter stresses the Romantic Period to the present. Representative piano literature will be performed and analyzed during all quarters. (2F, 2W, 2S) Wasserman

183. Enjoying Opera. The beginning and development of opera are studied by listening to recordings of the great classic works. Offered in Alternate years. (3W) Welti

184. Sacred Music. Evolution of cantata and oratorio and consideration of modern hymns and sacred music. Offered in alternate years. (3W) Dittmer

185. Symphonic Literature. The evolution of symphonic music is studied and analyzed from recorded examples from masters of the Baroque, Classic, Romantic, and Contemporary Periods. Offered in alternate years. (3F) Galos

186. Chamber Music. An analysis of chamber music forms and its development, including sonata literature. Offered in alternate years. (3W) Galos

201. Introduction to Musicology. This course aims to lay the foundations for a broad philosophy of music through a study of music acoustics, aesthetics, sources of music literature, and principles of music pedagogy. Open to upper division students only. (3F) Dalby

Theory and Composition


104, 105, 106. Advanced Theory. Continuation of Beginning Theory. Course includes advanced sight singing, keyboard modulation and introductory counterpoint. (3F, 3W, 3S) Dittmer

107. Scoring and Arranging. Study of each of the standard instruments in use today, their employment in small assemblies and large groups. Scoring and arranging for band, orchestra, and voices. (3W) Dalby

108. Counterpoint. Writing music in the contrapuntal style, as it applies to classic and contemporary music. (3W) Dalby

109. Form and Analysis. A study of musical form in both homophonic, polyphonic, and contrapuntal styles, through the analysis of examples taken from better music literature. (3F) Staff

111. Composition. Projects in creative composition for more advanced students. Prerequisite: Music 106, 107, and 109. (3S) Staff

Ensemble Performance

(Ensemble may be repeated under the same number)

25, 125. Orchestra. Provides training and practical experience in a wide range of orchestral works, including symphonies and major choral works. (Arr. F, W, S) Galos

26, 126. String Orchestra. Provides experience in large ensemble playing. (1F, 1W, 1S) Pahtz

28. ROTC Cadet Band. Open to men enrolled in ROTC Basic (Freshmen and Sophomores). Band drill and rehearsals. Fall quarter ROTC Cadet Band meets with the University Band (see Music 128). All ROTC Cadet Band students are excused from regular military drill. (Students may not receive
credit in both University and Cadet Band during any one quarter.) (1½F, 1½W, 1½S) Dalby


136. Opera Chorus. The chorus is trained to perform in the university opera. Auditions are conducted intermittently to determine progress in memorization. (2W) Welti

133. Choir. Open to all students desiring to sing good choral literature. Regular attendance is a condition of membership; public performances close each quarter’s work). (1F, 1W, 1S) Dittmer

137. Madrigal Singers. Study and performance of madrigals, motets, and distinctive choral literature. Membership by audition only. Auditions are conducted at first and second rehearsals or by appointment with conductor. (1F, 1W, 1S) Welti

138. Meistersingers. A selected group of men singers. Admission by application and audition. Auditions are conducted at first and second rehearsals or by appointment with the director. (1F, 1W, 1S) Welti

139. Chansonnets Club. A selected group of women singers. Admission by audition only. Auditions are conducted at first and second rehearsals or by appointment with the director. (1F, 1W, 1S) Welti

135. Opera Staging and Production. For those who sing roles in the opera or work on the production staff; credit of 1 to 4 hours is arranged in accordance with the project undertaken. (W. 1 to 4) Welti

42. Piano Ensemble. Original works for two pianos and piano, four-hands; training in sight reading; developing ability in ensemble playing. Audition required. Four students per section. Time arranged (1F, 1W, 1S) Wasserman

43. String Ensemble. Offers opportunities for capable string players and pianists to form trios, quartets, and other small units. (1F, 1W, 1S) Pahtz

44. Brass Ensemble. Brass quartets, sextets, and larger groups. Members are selected from applicants. (1F, 1W, 1S) Dalby

45. Woodwind Ensemble. A study of the literature for Woodwind Quintet and other small groups. (1F, 1W, 1S) Dalby

Music Education

140. Conducting Choral. Basic routines of dealing with vocal ensembles; assigned projects in leading small and large ensembles in vocal groups. (2F) Welti

141. Conducting Instrumental. Basic routines in dealing with instruments in ensembles, band, and orchestra. (3W) Dalby

150. Music for Elementary Schools. Application of music to the elementary school classroom. Problems, methods, and materials in singing, rhythms, creative music, reading and listening. (3W, 3S) Dittmer

151, 152, 153. Secondary School Methods and Materials. Teaching and administration of various phases of the music program. Choral 151, orchestra 152, and band 153. (3W, 3F, 3S) Required of all music majors. Staff

Applied Music, Individual and Class Instruction

(One, one-half hour private lesson per week, with required practice receives 1½ credits.

Students may register for individual instruction with any member of the music staff. They will be accepted only with permission of the instructor involved.
Since a knowledge of several instruments, as well as, vocal music are required for a major or minor in music, class instruction is provided for students beginning new instrumental or vocal training. The following classes each carry one unit per quarter.

80. Group Piano Instruction. Staff
81. Group Vocal Instruction. (1F, 1S) Welti
82. Group Woodwind Instruction (1W) Dalby
83. Group Brass Instruction. (1S) Dalby
84. Group String Instruction. (1F) Galos
85. Group Percussion Instruction. (1F) Staff
60, 160. Individual Piano Instruction. Staff
62, 162. Individual Organ Instruction. Clark
64, 164. Individual Vocal Instruction. Dittmer, Welti
70, 170. Individual Woodwind Instruction. Dalby
72, 172. Individual Brass Instruction. Dalby
74, 174. Individual Violin Instruction. Galos, Dittmer
75, 175. Individual Cello Instruction. Pahtz

University practice studios are available for student rental at the controller's office. Scheduling times are to be arranged through the Department of Fine Arts.

LIBRARY SCIENCE

Milton Abrams, Associate Professor and Chairman; Russell Davis, Assistant Professor; Ann Smith, Instructor; Vilate Ransom, Instructor; Ida Marie Logan, Instructor.

Library Science may be used as a teaching minor in connection with a major in Education. This course prepares the student for a library certificate as issued by Utah State Board of Education and for a position as school librarian on the elementary or secondary level. A teaching minor of not fewer than 18 credits must be selected from Library Science courses.

The courses required for an Elementary library certificate are English 24, L.S. 120, and L.S. 150; for a high school library certificate: L.S. 120, L.S. 150, and L.S. 155.

The following elective courses may be used to satisfy the requirement of the Northwest Association of High and Secondary School Standards of 30 hours for a library position in High Schools of more than 300 students. Education 161, 107; English 122; Speech 118.

1. Introduction to Librarianship. A preview of the library profession, Davis
50. Reference Materials. Basic reference tools and an introduction to the library. (3F) Davis
100. Advanced Reference and Bibliography. Principal reference materials in the major subject fields. Methods of bibliography. Prerequisite Library Science 50. (3S) Staff
113. Book Repair and Binding. Limited to Library Science minors. (S2) Staff
120. Cataloging and Classification. Dewey decimal system of arranging books in an orderly fashion and the methods of preparing a library card catalog. (4W) Davis
150. Library Administration. Procedures and techniques of library operation. (3S) Davis
155. Book Selection. The materials used and records required in ordering books. (3W) Davis, Smith

160. Art of the Book. The history of bookmaking, printing, and libraries. (3F) Staff

170. Readings and Conference. Time and credit arranged. Any quarter. Limited to Library Science minors. Instructors approval required. Staff

HEALTH, PHYSICAL EDUCATION AND RECREATION

H. B. Hunsaker, Professor and Head of Department; Lois Downs, Dale O. Nelson, Associate Professors; Pauline Fuller, Lincoln McClellan, Assistant Professors; Arthur Mendini, Clayne Jensen, H. Dale Rasmussen, Janice Pearce, Instructors.

Intercollegiate Athletic Staff

H. B. Hunsaker, Professor and Director of Athletics; Cecil Baker, Head Basketball Coach, Associate Professor; Everette Faunce, Head Football Coach, and Ralph Maughan, Assistant Football Coach, Assistant Professors; George Nelson, Trainer, Jack Nelson, Assistant Football Coach, Evan Sorenson, Freshman Coach, and Dale Gardner, Administrative Assistant, Instructors.

Activity Courses

In the activity courses opportunity is given each student to develop skills in some physical activity that will help establish a permanent interest in healthful recreation, both active and passive, the promotion of physical fitness, the building of morale, and the maintenance of health.

A physical examination is required of each student at the beginning of each year to advise him properly about the type of activity best suited to his individual needs.

Women students are required to take physical education activity courses for six quarters. Classes may be selected by the student; no course may be repeated for credit. A student must satisfactorily complete an elementary course or have the permission of the instructor before she can enroll in an intermediate or advanced activity course.

All male students should take some activity courses in Physical Education. Numerous courses in aquatics, dual, team, individual and outing activities are offered each quarter.

Intramural Activities

Intramural activities are conducted as part of the program of the Department of Health, Physical Education and Recreation. The intramural program is planned to give every student moral, social, physical, and educational values derived from competitive activities. This program provides for both individual and team endeavor and every attempt is made by the department to make possible for all students to participate.

The Women's Intramural Association, in cooperation with the Women's Division of the department, offers a widely varied program of activities. All women students are eligible and encouraged to participate in any or all of the activities offered during the year.

The department offers an extensive organized intramural sports program for men. Competition in a variety of activities is carried on in separate leagues; fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues.

Recreation

The Department of Health, Physical Education and Recreation aims to meet the recreational needs and interests of every student, whether he is pursuing a course of study in agriculture, engineering, business, or other
professional activity. The purposes of these activities are the development of a love of wholesome recreation and sufficient skills so that the students will continue to participate with satisfaction and enjoyment in various recreation activities after they become members of a community. Clubs are organized in a variety of activities so that the above purposes may be realized. These clubs including hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and square dancing.

Professional Preparation in Health, Physical Education and Recreation

In the department of Health, Physical Education and Recreation students may specialize in the following areas: Physical Education, Elementary Physical Education, Secondary Physical Education Certification, Recreation, Health, Dance, Professional Scouting, and Physical Therapy. A composite major including two of the above areas may be taken to meet the major-minor requirement. Selection of a program of study in these areas should be carefully worked out under the guidance of the student's adviser. The following courses, in addition to the six credits required for graduation, are suggested for each of the above areas:

Non-certifying Physical Education Majors should complete Physical Education 17A, 18, 20, 21, 22, 30, 31, 75, 83, 84, 85 or 92, 106, 107, 108, 183; six credits in Sports Techniques, and ten credits of approved electives.

Elementary Physical Education Majors should complete Physical Education 24, 55, 75, 81, 83, 84, 85 or 92, 106, 120, 177, 182, 183, 184; six credits in Sports Techniques and six credits from approved electives.

Secondary Physical Education Requirements

MEN

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<th>Course</th>
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<tr>
<td>P. E. 17A</td>
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<td>M. S.</td>
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<td>*Group Req.</td>
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<td>Eng. 1, 2, 3</td>
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<td>Electives</td>
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*Recommended Group Requirement.
Ex. Sc. = Chem. 10 & Physics 3 or 6

Sophomore

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Juniors

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Seniors

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Secondary Physical Education Women Majors should complete the following:

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Sophomore

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Junior

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Senior

Recruitment Majors should complete Physical Education 3, 17A, 18, 74, 75, 83, 84, 85, 153, 157, 179, 183, 196; three credits in Sports Fundamentals, four credits in crafts, music, drama, and photography.

Health Education Majors should complete Physical Education 55, 84, 108, 145, 183, 184; Public Health, 15, 50, 151, 152, 153, 156, and Psychology 145 or Sociology 162 or Social Work 165, and 12 credits from approved electives.

Dance Majors should complete Physical Education 72, 76, 81, 83, 102, 103, 104, 106, 107, 108, 111, 140, 150, 151, 153, 183, 184; six credits of approved electives.

Students planning to go onto a Physical Therapy School should complete Physical Education 3, 17A, 18, 74, 75, 83, 84, 85, 103, 104, 106, 107, 108, 111, 140, 150, 151, 153, 183, 184; four credits in Sports Fundamentals and four credits in Sports Techniques, and 12 hours from approved electives. Physical Therapy students should work closely with the adviser in selecting courses to fill groups and minor requirements.

**Master of Science Degree in Physical Education**

The Department of Health, Physical Education and Recreation offers courses leading to the Master of Science degree in physical education or recreation. Before admission to candidacy for the degree, a student must complete the equivalent of a Bachelor's Degree in physical education at Utah State Agricultural College and additional requirements as prescribed by the graduate school. Required courses are: P. E. 192, 250, 271, 295, 299, Ed. 267, Eng. 211.

Students entering the department for graduate study should select supporting fields from one or two other areas of the school, closely allied to physical education and recreation. Students should elect graduate courses from the areas selected. Suggested areas and courses are:

- **Education** 201, 211, 219, 221, 230, 237.
- **Health** 160, 166, Bact. 144, 151, 156, 168, 201.
- **Psychology** 107, 110, 140.
### Activity Courses for Men

2. Freshman Football (1F)
4. Boxing (1F, 1W, 1S)
5. Boxing (Advanced) (1F, 1W, 1S)
6. Football (1W) (Non-Varsity)
7. Wrestling (1F, 1W, 1S)
8. Wrestling (Advanced) (1F, 1W, 1S)
10. Indoor Track and Field (1W)
12. Track (1S)
15. Softball (1S)
16. Swimming (1F, 1W, 1S)
17. Swimming (Intermediate) (1F, 1W, 1S)
23. Basketball (1F, 1W, 1S)
29. Varsity Football (1F)
34. Soccer (1F)
35. Volley Ball (1W)
37. Trampoline (1F, 1S)
38. Tumbling and Gymnastics (1W)

### Activity Courses for Women

39. Soccer-Speed Ball (1F)
40. Volleyball (1F, 1W)
41. Basketball (1W)
42. Softball (1S)
43. Field Hockey (1S)
44. Tumbling and Stunts (1W, 1S)
52. Swimming (1F, 1W, 1S)
56. Swimming (Intermediate) 1F, 1W or 1S)
58. Rifle (1W)
60. Body Conditioning (1F, 1W, 1S)
152. Synchronized Swimming (1F)

### Activity Courses for Men and Women

1. Hiking (1F, 1S)
3. Skiing (1W)
9. Fencing (1F, 1W, 1S)
13. Bowling (1F, 1W, 1S)
18. Swimming (Advanced) (1F, 1W, 1S)
19. Skiing (1W) 2nd Quarter
45, 46, 47. Adapted Physical Education. A Program designed to meet the needs of individuals who are unable to participate in the required program of Physical Education. Students must obtain permission of the head of the department before registering. (1F, 1W, 1S)

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- **Staff**: Sorenson, G. Nelson, Faunce, Maughan, McClellan
- **D. Nelson**: Fuller, Downs, Fuller, Fuller, Fuller, Fuller
71. Tap Dancing (Interm.) (1F, 1W) Fuller
72. Social Dancing (1F, 1W, 1S) Staff
73. Golf (1F, 1S) Staff
74. Life Saving. Prerequisites: Red Cross Swimmers Card or permission of instructor. American Red Cross Certification is given to students who pass the examination. (2F, 2W) Rasmussen
76. Social Dance (Advanced) (1F, 1S) Staff
90. Tennis (Intermediate) (1S) Staff
136. Golf (Advanced) (1S) Staff
141. Modern Dance (Advanced) (1W, 1S) Fuller
155. Diving. Prerequisite: PE MW 18 (1S) Staff
161. Archery (Advanced) (1W, 1S) Staff
166. Badminton (Advanced) (1F, 1W, 1S) Downs
167. Tennis (Advanced) (1S) Staff
168. Square Dancing (1F, 1W, 1S) Jensen

**Professional Courses**

17A. Swimming. For screening of all freshmen and transfer students majoring in Physical Education. (1F, 1W) Rasmussen

20. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Tennis and Archery. (1F) Taught alternate years. Not taught 57-58. Staff

21. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Social and Square Dancing. (1W) Taught alternate years. Not taught 57-58. Staff

22. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Badminton and Golf. (1S) Taught alternate years. Not taught 57-58. Staff

24. Dance Laboratory. Folk dancing for freshman and sophomore women majoring or minoring in physical education. (1F) Taught alternate years. Not taught 57-58. Fuller

26. Dance Laboratory. Tap dancing for freshman and sophomore women majoring or minoring in physical education. (1S) Taught alternate years. Not taught 57-58. Fuller

30. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Boxing and Wrestling. (1F) Taught alternate years. Staff

31. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Tumbling, Gymnastics and Trampoline. (1W) Taught alternate years. Staff

32. Fundamentals of Sports. A professional course designed to develop the fundamental skills of Volleyball and Speedball. (1S) Taught alternate years. Staff

55. First Aid. Standard American National Red Cross course in first aid with emphasis on practical use of the knowledge as applied to everyday life in various occupations. Detailed demonstrations and practice. American Red Cross First Aid certificate may be obtained by students who pass a satisfactory examination. (3F, 3W) Jensen

75. Introduction to Physical Education. An introduction to the historical background, philosophy, theory and practice in Physical Education. (2F) Staff

77. Dance Laboratory. Techniques of Elementary Modern Dance for freshman and sophomore women majoring or minoring in Physical Education. (1F) Taught alternate years. Fuller
78. Dance Laboratory. Techniques of Intermediate Modern Dance for freshman and sophomore women majoring or minoring in Physical Education. (1W) Taught alternate years. Fuller

79. Dance Laboratory. Techniques of Advanced Modern Dance for Freshman and sophomore women majoring or minoring in Physical Education. (1S) Taught alternate years. Fuller

81. Rhythms and Dramatic Games. Rhythms for young children; its use in creative movement. Methods of presenting and developing rhythms are studied (2F) Fuller

83. Playground and Community Recreation Leadership. Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (3S) Fuller

84. Problems in Physical Growth. The individual is traced through the various stages of development with special emphasis on the physical aspects of growth. Principles and function of activity is applied. (3S) Jensen

85. Organization of Intramural Sports. Organization and administration of intramural sports in secondary schools. Sports, tournaments, units of competition, scoring systems, and co-ordination of intramural sports with physical education and athletics are considered. (3F) Mendini

86. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating football, touch football, basketball, wrestling and boxing. Attention also is given to the proper instruction of other game officials such as timers, scorers and game administrators. (2F) Mendini

87. Sports Officiating for Men. Knowledge of the rules and mechanics of officiating volleyball, ski meets, water basketball, badminton and softball. The techniques of officiating basketball are reviewed. Attention also is given to the proper instruction of other game officials such as timers, scorers and game administrators. (2W) Mendini

92. Organization of Intramural Programs for Women. Organization of sports days, play days, tournaments, and administration of intramural activities for women. (3W) Downs

93. Sports Officiating for Women. Techniques of officiating, knowledge of rules, and practical experience in officiating. (2F) Staff

94. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of soccer-speedball and volleyball. (1F) Taught alternate years. Downs

95. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of basketball and basketball officiating. (1W) Taught alternate years. Downs

96. Physical Education Laboratory. A professional course for lower division women designed to develop the fundamental skills of softball and field hockey. (1S) Taught alternate years. Downs

98. Physical Education Laboratory. Fundamentals of individual sports for lower division women majoring or minoring in physical education. (1S) Taught alternate years. Not taught 57-58. Downs

102. Dance Composition. Composition based upon the special elements of direction, level, and dimension. Experience in composing for an individual and for group. (2F) Fuller

103. Dance Composition. Composition based upon the following musical forms: AB, Rondo, Theme, and Variation, Canon and Round, Dance Suite. (2S) Fuller

104. Dance Production. Composition done independently and participation in a performance required: lighting, staging, costume and make-up applied to a dance concert. (2W) Fuller

106. Scientific Foundations of Physical Education. "Basically" a study of Kinesiology which is the science of movement. The course includes a study
of the structure of the human body in terms of its use in activity; a mechanical analysis of all types of activity based on principles of good body mechanics; and accepted methods of using and developing the human body. (3F) D. Nelson

107. Scientific Foundations of Physical Education. "Basically" a study of the physiological functions of the human body in various types of activity. The course includes a detailed study of the physiological changes that take place during all kinds of activity. The application of physiological principles are then applied to physical education. (3W) D. Nelson

108. Scientific Foundations of Physical Education. "Basically" a study of the adapted physical education program. The course includes the administration of a corrective physical education program in addition to a study of abnormal problems in body mechanics, Athletic injuries and their treatment, Athletic training procedures, and principles dealing with abnormal conditions found in the physical education program. (3S) D. Nelson

111. Creative Rhythms for Schools. Methods and materials used in guiding creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W) Fuller

113. Construction of Physical Education Equipment. Construction of and practice in the use of rhythmic instruments and play equipment. (3S) Staff

120. Methods in Physical Education. A study of theories of learning and their practical application to the teaching of physical education. Open to men and women. (2F) D. Nelson; Downs

121. Techniques in Physical Education. A professional course designed to develop teaching techniques in social and square dance. Open to men and women. (2W) Taught in alternate years. Not taught 57-58. Staff

122. Techniques in Physical Education. A professional course designed to develop teaching techniques in tennis and badminton. Open to men and women. (2S) Taught alternate years. Not taught 57-58. Staff

124. Scoutmaster's Basic Training Experience. The standard training course approved by the National Council and includes the following: Plans and methods, fundamentals, organization and leadership, program planning, meetings, hiking, and camping. (2S) Staff

130. Technique in Physical Education. A professional course designed to develop teaching techniques in boxing and wrestling. (2W) Taught alternate years. Staff

131. Technique in Physical Education. A professional course designed to develop teaching techniques in gymnastics, tumbling, trampoline and speed-ball. (2S) Taught alternate years. Staff

132. Water Safety Instructor's Course. Prerequisite: American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching, swimming, diving, life-saving and use of small water crafts. Proper American Red Cross certification is given students who pass the examination. (2W, 2S) Rasmussen

135. Safety Education. (a) The needs for safety education; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions; and readings, stressing various aspects of safety in many areas. (2S) Staff

140. Dance History. A history of dance from the primitive through Greek, Medieval and Renaissance periods into the theatrical dance forms: Ballet and Modern. (3W) Fuller

145. Alcoholism and Education. The alcohol problem is considered from the physiological, psychological, sociological, educational, historical, and legal aspects. The development of a correlated attack on the problem is emphasized. (3S) D. Nelson

150. Methods in Dance. The place of various types of dance in the physical education program. Emphasis given methods of teaching these activities and practice in teaching class members. (2S) Fuller
151. Techniques of Dance. Techniques of a variety of dance types with emphasis on ballet and modern. (2S) Staff

153. Leadership in Dance. An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing is prerequisite. A syllabus is required. (2S) Staff

157. Social Recreation Leadership. Practical experience in conducting social recreation activities by planning and conducting social recreation evenings for church, school and civic groups. Prerequisite: P.E. 83. Time and credit arranged. (F, W, or S) Staff

160. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in soccer, speedball and volleyball. (2F) Taught alternate years. Staff

161. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in basketball. Consideration is also given to officiating basketball. (2W) Taught alternate years. Staff

162. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in softball and field hockey. (2S) Taught alternate years. Staff

165. Techniques in Physical Education for Women. A professional course designed to develop teaching techniques in stunts and tumbling. (2S) Taught alternate years. Not taught 57-58. Staff

177. Physical Education. A course designed to give a philosophy of Physical Education in the Elementary school. Emphasis is placed on program planning, teaching techniques, the direction and participation in elementary Physical Education activities and the choosing of activities that will help satisfy the needs of the elementary school child. (3F) Downs

179. Camping and Camp Craft. Training in camp technique and camp leadership. Different types of camps and their organization, supervision, equipment and safety are considered. Several short hikes and an overnight camp are conducted during the course. Each class member is expected to participate in these hikes. (2S) Mendini

182. Physical Education. A course designed to gain an understanding of the Elementary School Physical Education program. Curriculum facilities, equipment, and the teaching of activities are emphasized. Emphasis is also placed on the activities as specified in the Utah State Course of Study for the elementary school. (3W, 3S) Downs

183. Interpretation of Physical Education Objectives. Results and values of physical education activities under leadership in terms of development, adjustment and standards, and their relationships as objectives. (3F) Hunsaker

184. Administration of Physical Education. Administration procedures in the conduct of physical education in the high school; curriculum construction and program planning. (3S) Hunsaker

188. Methods in Football. Fundamentals of football, theory and practice, details of each position on the team, training, and managing, complete technique of developing offensive and defensive tactics. (2W) Faunce

189. Methods in Basketball. Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; methods of defense and offense. (2F) Baker

190. Methods in Baseball and Track. The course is taught in two distinctive phases. (a) Fundamentals in track and field, training and the conduct of athletic meets. (b) Fundamentals of baseball, team play, training and strategy. (2S) Staff

191. Interpretation of the Health Examination. Examination procedures, the detection of physical defects, the general assessment of the health of the individual and the follow up program. (3S) Staff
192. Tests and Measurements in Physical Education. Practical studies of tests now used and technique of test construction. (3W) Hunsaker

194. Problems of Athletics. Discussion problems in athletics relative to public relations, athletic management, administration of athletics, purchase of equipment, schedules, plant layout, etc. (3S) Staff

196. Organization of Recreation. Problems of organization and administration of community recreation departments, including staff, facilities, program of activities and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school co-operation in a United recreation program. (3S) Jensen

250. Reading and Conference. Credit arranged. Provides for individually directed study. D. Nelson

271. Research and Thesis Writing. Credit arranged. Hunsaker

295. Problems in Physical Education. (3F, 3W, 3S) Hunsaker


PSYCHOLOGY AND GUIDANCE

Arden N. Frandsen, Professor and Head of Department; David R. Stone, Heber C. Sharp, Parley Newman, Associate Professors; Benjamin H. Pubols, Jr., E. Wayne Wright, Assistant Professors.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Courses in psychology contribute, therefore, to both professional training and personal development of students in nearly every department of the University.

A major or preferably a master’s degree in psychology should prepare students professionally (1) for guidance and psychological counseling in high schools; (2) for teaching psychology, study habits, mental health, and personality development in high schools; (3) for diagnostic and remedial teaching and for dealing with personality and conduct problems of children in elementary schools and in child guidance clinics; (4) (with additional courses in Education) as a “special” teacher of exceptional children; (5) as clinical psychologists (with additional graduate training) in mental hygiene clinics and hospitals; (6) for personnel work (at the junior professional level) in industry, the U. S. Employment Offices, various Civil Service positions, and in the military services, and (7) for further graduate study in psychology, education, child development and social work. Psychology is also a suitable major for students planning to study medicine, nursing, law, and social work, or personnel work after graduating with a bachelor’s degree.

The Department of Psychology has arrangements with schools, social welfare agencies, juvenile courts, the industrial school, and a mental hospital in which graduate students and some seniors may have practical experience in the general field of clinical psychology. The experiences include educational and vocational counseling; diagnosis and guidance of gifted, subnormal, and delinquent children; diagnosis and treatment of conduct and personality problems; diagnosis and remedial instruction for achievement difficulties in school subjects; teaching psychology in high school or college; teaching exceptional children; and for various kinds of psychometric work.

Lower Division Preparation for Psychology. The best preparation for psychology is basic training in biological science, social science, literature, mathematics and physical science. In completing the group requirements, it is recommended that the following courses be included: Physiology 4; Sociology 70; English 40, 45, and other literature (novel and biography) courses; Mathematics 34, 35, and desirably additional mathematics courses for students with interest in the subject; Physics 7. The minimum of 40 hours in the “group requirements” might well be exceeded. Psychology courses for lower division students expecting to major in psychology are Psychology 53, 71, and, if desired before attaining upper division status, 100, 105, and 112.
Requirements for a major in psychology include 40 credits of approved courses from the following basic: Psychology 53, 71, 100 or 105, 127, 140 or 145, 161, 183, 281, 282; and elective: from Psychology 80, 102, 105, 108, 114, 115, 121, 123, 140, 145, 155, 175, 191; Sociology 170; Education 110; Speech 167, or 173. As upper division electives, Zoology 111; Physiology 121, 122, 123; the Education courses for teachers certification; Sociology 130, 153; S. W. 165, 270; an upper division courses in literature are also suggested.

A minor in psychology (which should include Psychology 53, 71, 100 or 105, 112, 127, 140 or 146, 161, 281, and 183) is recommended for high school teachers who expect to participate in the school guidance program, social workers, students majoring in speech correction, students whose major is business administration, and students majoring in other social sciences.

Master of Science Degree in Psychology. Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program planned to meet the student's professional objectives may be arranged to include courses both from psychology and pertinent fields. In preparation for meeting the requirements for the Professional School Counselor's Certificate, for example, courses mainly from psychology and education would be chosen. Lists of the prescribed courses for this certificate and for other special professional objectives may be obtained from the Department Head. Besides the courses required for a specific professional objective, the Master of Science degree in psychology should include, as a graduate or undergraduate student, study in the following fields: (1) general and experimental, (2) systems and history, (3) learning, (4) child and adolescence (included in educational), (5) clinical psychology, (6) mental hygiene, abnormal psychology and physiological, (7) social psychology, (8) personality, (9) statistics, and (10) research thesis. Besides additional courses from those listed in each of the above 10 areas, courses planned especially for graduate students are: Psychology 115, 123, 175, 191, 202, 205, 208, 212, 213, 214, 216, 217, 280, 281, 282, 284, 285, 286, 287 or 288. For students who have not majored in psychology thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin graduate study in psychology.

Master of Science Degree in Guidance. Any able student who has a teaching certificate and a total of 30 credits in Education and, or in Psychology is eligible to begin study for this degree. Included in the courses required are: Education 110; Guidance 187, 213; and Psychology 123 or 140, 127, 183, 202 or 205, 281, 282, 285, 288; and a thesis in the field of guidance. These are also the courses required for a Professional Counselor's Certificate.

Personnel in Business and Industry: In cooperation with the Inter-Departmental Program in Human Relations, psychology students may earn a Master's degree in Personnel Psychology. This program would include the central courses outlined by the committee, and the following courses: Psy. 71, 80, 102 or 105, 112, 127, 140 or 145, 181, 183; Speech 9; Merchandising 63, 156; Sociology 130, 160, 161; and Social Work 165, 174.

Doctorate in Educational Psychology and Counseling. The Department of Psychology, in cooperation with the Department of Education has planned a program of advanced graduate study in counseling, school clinical psychology, and educational psychology that leads to the Ph.D. degree in Educational Psychology. The program requires two years of graduate study (partly supervision of individual study) beyond the M.S. degree, plus a six months' internship in school, mental hygiene clinic, hospital, or social agency. Prospective candidates interested in learning more about this program should confer with Dean John C. Carlisle or Professor Arden Frandsen.

Courses

33. Mental Hygiene for College Students. Deals with the common personal and social problems of normal people, that is, problems which arise when people try to get along together. It is intended as a basis for improving self-understanding, personal and social effectiveness, happiness and emotional health. (3F) Sharp
53. Elementary General Psychology. Principles of human behavior and experience, including: nature of personality; factors of determining development; how we learn, observe, and think; motives of human conduct; dealing with people; maintenance of personal efficiency and mental health. For Lower Division students in all schools of the College. (5F, W, or S)  

Staff

71. Experimental Methods in Psychology. A study of the scientific methods and of specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: General Psychology. (3W) Pubols

80. Reading and Study Skills. A practical course, highly individualized, designed to aid students in improving the efficiency of their work and study habits. Individual appointments arranged for one-third of the time. (2F, W, or S) Stone

100. Human Growth and Development. A study of the developmental characteristics and processes of human physical and psychological development from birth to maturity. For prospective elementary and secondary teachers. (3F, 3W, 3S) Staff

102. Educational Psychology for Secondary Teachers. A professional course for prospective high school teachers intended to increase understanding of adolescents and to develop insight into conditions for effective learning. Applications to development in adolescence of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects are emphasized. Prerequisite: General Psychology. (3F, W, or S) Stone

105. Child Psychology and Development. The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional developments in children from birth to adolescence. Generalizations with respect to dynamic personality, individual differences, emotions, motivation, how children learn, observe, and think are applied to understanding and guiding children's behavior in home, school, and community. Opportunity for observation and applications of psychological methods of child study in the school is provided. Prerequisite: General Psychology. (3F, W, or S) Frandsen

108. Educational Psychology for Elementary School Teachers. A study from the point of view of psychological theory and research, of the aims, selection and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. Prerequisite: General Psychology. (3F, W, S) Frandsen

112. Application of Statistics to Education and Psychology. Elementary study of statistical procedures used in handling test scores in schools and of the concepts needed to read current educational and psychological literature. May be taken by last quarter sophomores who have taken General Psychology. (3F or S) Frandsen

115. Seminar. Readings and Discussions on Current and Special Topics in Psychology. Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or periodical literature on a specialized topic, selected according to student's interest. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2F, W or S) Staff

121. Individual Differences. The nature, extent, and causes of human differences and of the implications and applications of a recognition of these differences in several major life activities. The concepts of human differences have useful applications in the work of the students majoring in the other social and biological sciences. (3S) Sharp

123. Psychology of Exceptional Children. The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment, suited to their needs. The groups included are the mentally deficient, physically handicapped, the gifted, and children having serious personality and conduct problems. (3W or Su.) Sharp

127. Psychology of Learning. A comprehensive study of descriptions of learning, factors related to efficiency, explanatory theories of learning, and of
applications of the facts and explanatory principles to guiding learning in
school and out-of-school situations. Prerequisite: General Psych. (3S) Pubols

140. Abnormal Psychology. A descriptive and explanatory study of the
varieties of mental abnormality — psychoses, psychoneuroses, and minor mal-
adjustments — their causes, the methods of treatment and the mental hygiene
approach in preventing psychological maladjustments. Prerequisite: General
Psych. (3S) Sharp

145. Mental Hygiene. Designed for teachers and other workers in social
occupations. Based on the philosophy that a knowledge of the factors which
influence mental health should be in the possession of all who work with peo-
ple. Intended to promote understanding of emotional and social adjustment
and as a basis for guiding children, adolescents and adults toward improved
mental health. Prerequisite: General Psych. (3W) Sharp

155. Psychology of Business and Industry. Methods and explanatory prin-
ciples of psychology are applied to understanding several general problems of
business and industry, including vocational choice; selection of employees; ad-
vertising and selling; marketing and consumer research; conditions for efficient
work, and psychological aspects of training for work in business and industry.
(See also Business Administration 155) Prerequisite: General Psychology or
instructor's approval. (3F) Himes

161. Social Psychology. A study of the acquisition of personality or “self.”
The effect of society on the individual, and the individual's reciprocal effect
on society are considered in terms of such topics as propaganda, institutional
behavior, “social” neuroses, morale, leadership, and membership. Prerequisite:
General Psych. (3W) Staff

162. Social Psychology of Teaching. An application of the concepts of
“self” and of “group dynamics” to teaching, and to leadership and participa-
tion in other social situations. (3W) Staff

165. Psychology of Military Leadership. (3S) Newman

175. Physiological Psychology. Physiological mechanism underlying nor-
mal and abnormal behavior, with special attention to those operating in both
organic and non-organic disturbances. Prerequisite: General Psych. (3S) Pubols

183. Theory and Techniques of Counseling. Principles and techniques of
counseling students on problems of curriculum planning and vocational choice,
on problems of improving methods of study, and on problems of emotional and
social adjustment will be studied. Applications will be made also to admin-
istrative, supervisory teaching, and other inter-personal relations situations.
(3S) Wright

191. History and Systems of Psychology. History of psychology and a
critical comparison of the several systematic points of view on major problems
in psychology. (3S) Staff

202. Psychology of Adolescence. Growth, psychological and social charac-
teristics and development, educational and guidance needs, and adjustment
problems of adolescents as met in schools, homes, and communities. Prereq-
quisite: Educational Psych. (This course and the Psychology of Learning
provide training in advanced educational psychology for graduate students in
secondary education and in psychology. (3Su.) Staff

205. Problems in Child Psychology and Guidance. Elementary school child
guidance problems—study of the roles of teachers and child guidance special-
ists in promoting mental health and in diagnosing and treating problems of
achievement, social adjustment, and emotional adjustment. The course may
be considered as an advanced course either in child psychology or in elementary
school guidance. Alternates with Psychology 280. (3F) Staff

208. Advanced Educational Psychology of the Elementary School. Ad-
vanced study, from the points of view of learning theory and experiments in
elementary education and child psychology, of the aims, curriculum, methods
of teaching, provisions for individual differences, and evaluation of outcomes
in the elementary school. Intended especially for supervisors, principals, and teachers of the elementary school interested in graduate study. Thesis topics are suggested. Provision is also made for undergraduate students who need the course Psych. 108 for certification. (3Su.) Frandsen

212. Treatment of Psychometric Results. Statistical methods of representation, and analysis of interrelationships of psychological test scores. (2W) Frandsen

214. Independent Readings in Psychology. For students who cannot participate in the discussions in Psychology 115, this course provides opportunity for independent readings and conferences on topics selected by the student. (2F, W or S) Staff

216. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) Staff

217. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) Staff

280. Personality. An advanced study of the organization, development, dynamics, and appraisal of personality. Theories and empirical investigations of personality will be studied as a basis for arriving at integrated concepts of the nature and development of personality. Both the biological and cultural determinants of personality will be considered. (3F) Staff

281. Psychometrics Applied to Guidance. For school counselors, personnel workers, social workers, and clinical psychologists. Consideration is given selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisite: General Psychology and Elementary Statistics. For seniors or graduate students. (5F) Frandsen

282. Individual Diagnostic Intelligence Testing. Theory and techniques of testing, including practice in the administration of (a) the Stanford-Binet and other individual tests especially suited to psychological examination of children, and (b) the Weschsler-Bellevue and related tests for use with adolescents and adults. Interpretation of test data. (5W) Frandsen

284. Hospital Treatment of Mental Patients. Seminar and staff conferences on personality appraisals, diagnoses, and treatment of mental hospital patients. Students observe and participate in treatment to the extent they are qualified in all of the hospital routines and “treatment” activities in which patients participate. (4F, W or S) Staff


286. Problems in Counseling and Clinical Psychology. Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy are studied. (2F) Staff

288. Practicum in Clinical Psychology. Arrangements are made for obtaining experience under staff supervision in vocational guidance; diagnostic testing and writing of interpretative reports; counseling; psychotherapy; diagnostic and remedial teaching. Subjects include children, adolescents, and adults in schools, institutions for the mentally retarded and for delinquents, and patients in mental hospitals. Psychological procedures and institutions are selected according to qualifications and interests of each student. Time and credit arranged. (F, W or S) Staff

300. Educational-psychological theories in practice. From observation and wide reading of educational-psychological theories — on motivation, learning, individual differences, personality, interpersonal relations, evaluation, etc. — hypotheses will be formulated for checking by observation in selected
school situations, both at the elementary and secondary levels. Class activities include two hours each of observation and discussion. (3W) Frandsen


Guidance


287. Occupational Information. Collection, classification and uses of occupational information in counseling. (2W) Wright

297. Workshop in Guidance. A faculty or part of a faculty in a school or school district studies, evaluates, and attempts to improve the use of the school’s resources for more effective guidance in its several phases. (3) Staff
COLLEGE OF ENGINEERING AND TECHNOLOGY

Division of Engineering ................................................................. 163
Engineering Drawing ................................................................. 164
Agricultural Engineering ............................................................ 165
Chemical Engineering ................................................................. 166
Civil and Irrigation Engineering .................................................. 167
Electrical Engineering ................................................................. 174
Tool Engineering ....................................................................... 178
Engineering Experiment Station .................................................. 181
Division of Technology ............................................................... 181
Aeronautical Technology ............................................................. 182
Automotive Technology ............................................................... 185
Industrial Education ................................................................. 188
    Industrial Arts ................................................................. 189
    Trade and Industrial Education ............................................. 189
    Industrial Management ....................................................... 190
    Woodworking and Building Construction .................................. 190
Welding ......................................................................................... 195
The College of Engineering and Technology consists of the Division of Engineering and the Division of Technology. The Division of Engineering offers both undergraduate and graduate curricula in professional engineering. The Division of Technology offers both two-year and four-year curricula in several specialized fields of Industrial Technology. It also offers undergraduate and graduate courses in Industrial Education.

Admission. For general requirements, see "Academic Regulations," in the Introduction, page ....... In addition the applicant must have completed at least one unit each of high school algebra and plane geometry with grades of C or better. Solid geometry, physics and chemistry are strongly recommended. For the engineering curricula, to enter without deficiencies, the student must have completed a minimum of 1½ units of algebra (and preferably 2 units), and be capable of carrying successfully Math 35 (College Algebra). Students with deficiencies in high school mathematics are strongly urged to spend a Summer Session in college preparatory work at this University prior to registration for the Fall Quarter. Students who enter the Fall Quarter with deficiencies, and those who are unable to carry successfully the mathematics courses listed for the Freshman year, will have an opportunity to make up this deficiency during the Summer Session, between the Freshman and Sophomore years. All students will be expected to be registered for Math 98 (Differential Calculus) concurrently with Physics 20, Fall Quarter of the Sophomore year. Students planning to take Advanced Air Science or Military Science, should arrange a five year program of study.

Scholarship. All students must maintain an average grade of C or higher to remain in the College of Engineering and Technology and to be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade of C, or higher. A student who receives a grade of D in any mathematics or engineering sequence courses must repeat this course before proceeding in the sequence unless specifically excused, in writing, by the advisor and the instructor of the succeeding course. Students must maintain a C average in all mathematics and engineering or technology courses. It is strongly recommended that physics courses with D grades be repeated.

Graduation. Candidates for graduation must satisfy the general University requirements listed in "Academic Regulations," except those pertaining to group requirements. They must, in addition, satisfy the requirements of the prescribed curriculum of their elected majors, and must have a C average (grade point average of 2.00 or more) in all mathematics and engineering or technology courses for which they have registered.

Opportunity for Graduates. The tremendous development in modern industry, the necessity for control and development of natural resources, the rapid advance of transportation and communication, and the development of structures to meet the needs of society, give assurance that graduates of the College of Engineering and Technology will have ample opportunity for remunerative professional employment.

Faculty Advisers. Personal contact with the student is provided through advisers who assist the student when registering, and who are available for consultation at all times.

Employment Assistance. The College of Engineering and Technology, through its faculty, establishes contacts with those industries, corporations, municipal, state and federal agencies that employ technically trained men. Employment assistance is given to members of each graduating class, to alumni who desire to change positions, and to undergraduates who wish summer employment.

Division of Engineering

The Division of Engineering offers undergraduate curricula in Civil Engineering, Electrical Engineering (Electronics and Communications Option),
Tool Engineering, and Welding Engineering. Graduate study for the Master of Science degree is offered in Civil Engineering, Electrical Engineering, and Irrigation and Drainage Engineering. The Civil and Irrigation Engineering Department provides a two-year graduate program for the professional degree of Civil Engineer and Irrigation Engineer, and collaborates with other departments in offering the Doctor of Philosophy degree in Irrigation Science.

A department of Engineering Drawing provides service courses in drafting for all departments of the University.

Objectives. The objectives of the four-year curricula in engineering are to provide the student with an opportunity to obtain the thorough, fundamental, and technical education necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities that are essential to high professional attainment. The curricula are carefully planned to meet the recommendations of the Engineers Council for Professional Development.

Upper Division Standing. A student must have completed 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22 and Mathematics 99 or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

Engineering Societies. General professional association and advancement are promoted by activities of student branches of national engineering societies. The following are represented, either by institutional membership, faculty membership, or student chapter: American Concrete Institute, American Geophysical Union, American Road Builders Association, American Society of Agricultural Engineers, American Society of Civil Engineers, American Society for Engineering Education, American Society of Tool Engineers, the Institute of Radio Engineers, and others.

Honor Societies and Scholarships. The Alpha Delta Chapter of Sigma Tau was installed at Utah State University in February, 1951. Membership is elected from junior and senior engineering students whose scholarship is in the upper third of their class.

Graduating Seniors in the upper ten percent of the class are eligible for membership in Phi Kappa Phi. Graduate students may be elected to Associate Membership in Sigma Xi, honorary scientific society.

Several scholarships are available to engineering students. (See "Scholarships, Fellowships, Awards" in Introduction to catalog.)

Engineering Seminars. Engineering seminars are a feature of the advanced engineering work. Course C.E. 198 is required of all Civil Engineering students in their senior year. E.E. 175 and T.E. 184 are required of Electrical and Tool Engineering seniors respectively.

Field Trips. Field trips to local construction projects, engineering works, and industries are arranged for engineering students. Seniors in engineering usually take a supervised field trip covering the major engineering works in the western United States. This trip is usually scheduled in the Spring Quarter.

### Common Freshman Curriculum in Engineering

<table>
<thead>
<tr>
<th>Dept. No.</th>
<th>Course Title</th>
<th>F</th>
<th>W</th>
<th>S</th>
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<tbody>
<tr>
<td>C.E. 1, 2, Electives&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Engineering Orientation</td>
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<tr>
<td>E.D. 61, 62</td>
<td>Engineering Drawing</td>
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<tr>
<td>E.D. 63</td>
<td>Descriptive Geometry</td>
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</tr>
<tr>
<td>Math. 35&lt;sup&gt;2&lt;/sup&gt;</td>
<td>College Algebra</td>
<td>5</td>
<td></td>
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</tr>
</tbody>
</table>

<sup>1</sup>Orientation taken in Spring Quarter is under direction of the major department.

<sup>2</sup>Students deficient in High School mathematics, Algebra B, will register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore years.
ENGINEERING DRAWING

Austin G. Loveless, Associate Professor and Head of Department; Carl R. Wallis, Assistant Professor; Ross A. Nyman, A. B. Smith, Instructors.

Note: Students taking engineering drawing courses are advised not to purchase their instruments or supplies until after they have attended the first scheduled exercise.

The Engineering Drawing department offers service courses in drafting and blueprint reading to all departments of the University.

The Department's four drafting laboratories have a total floor space of 5400 square feet and are equipped with 120 individual drafting tables. Modern instructional equipment such as drafting machines, reproduction facilities, moving pictures, slides, and other teaching devices are available to students. Since this is primarily a service department, basic courses are designed to meet needs of many departments.

Students may qualify for a minor in Engineering or Mechanical Drawing on completion of 18 credits, including Descriptive Geometry.

Courses

59. Blueprint Reading and Industrial Drawing. For those desiring only one quarter's work in drafting. Reading and interpretation of blueprints, lettering, use of instruments, and basic drafting practices. Two lectures, two labs. (3S) Nyman

60. Elementary Drafting. For Forestry students. Use of instruments, simple lettering, and drafting fundamentals. One lab. (1W) Staff

61, 62. Engineering Drawing. The use of drafting instruments, graphic solutions, applied geometry, lettering, shape and size description, sectioning, and standard elements and symbols. (3F, W, S) Staff

63. Descriptive Geometry. Principal and auxiliary views, points, lines, and planes, developments, intersections and warped surfaces. Engineering problems relating to cut and fill, mining, geology, and industrial design are selected. Prerequisites: E.D. 61 or L.A. 20. One lect., two labs. (3F or S) Staff

93. Mechanical Drawing. Advanced work for those interested in an engineering drawing minor. Includes industrial drawing, and fundamentals of architectural, structural, welding, piping, and electrical drawings. Prerequisite: E.D. 62 (3F, S) Staff

94. Working Drawings and Specifications. An introduction to architectural drawing and specifications applied to building and construction problems. Scale drawings including plans, elevations, sections and construction details are completed with tracings and prints. Prerequisite: E.D. 62 (3W) Staff

95. Machine Design. Mechanisms of power and motion and the design of machine parts incorporating standard industrial methods. Prerequisite: E.D. 63. (3F) Staff

120. Machinical Drawing for Industrial Arts Teachers. Preparation of course work and training of teachers to teach architectural, sheetmetal, ma-

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3Department requirement indicated in Freshman year under the respective curricula. If indicated as elective, must be approved by Department Head.
chine, and electrical drawing, in junior and senior high school industrial arts program. Prerequisite: E.D. 62 or equivalent. (3F) Loveless

194. Mechanical Perspective. Practical problems in angular, parallel, and oblique perspective. Rendering finished drawings. Prerequisites: E.D. 62. (3S) Loveless

195. Industrial Production Illustration. Translation of working drawings into dimetric and trimetric projections, exploded views, and assemblies as a means of rendering industrial illustrations. Prerequisite: E.D. 95. (3W) (Taught alternate years with E.D. 194) Loveless

196. Aircraft Drawing. Aircraft techniques, numbering systems, change methods, and technical specifications. Prerequisite: E.D. 63. (3S) Staff

AGRICULTURAL ENGINEERING

Spencer H. Daines, Associate Professor and Head of Department; J. Donald Wadsworth, Extension Agricultural Engineer; Von H. Jarrett, Assistant Professor; Glen E. Stringham, Instructor and Project Engineer for College—Industry Farm Electrification Committee.

The Department of Agricultural Engineering offers service courses involving application of engineering knowledge to farm problems related to farm machinery, farm power, farm structures, drainage, irrigation, soil erosion control, and modern farm and home equipment.

The Department also offers service courses in farm mechanics, designed to give students practical training in use of hand and power tools and other mechanical skills related to farming and industry. Classes are open to all university students.

Typical Program of Study For Two-Year Certificate of Completion in Agricultural Mechanics.

<table>
<thead>
<tr>
<th>First Year</th>
<th>Second Year</th>
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</thead>
<tbody>
<tr>
<td>Course</td>
<td>F</td>
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<tr>
<td>Math. 34, 35, 44</td>
<td>3</td>
</tr>
<tr>
<td>English 1, 2, 3</td>
<td>3</td>
</tr>
<tr>
<td>E.D. 61, 62, 63</td>
<td>3</td>
</tr>
<tr>
<td>Welding 91, 94</td>
<td>3</td>
</tr>
<tr>
<td>A.E. 1</td>
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</tr>
<tr>
<td>A.E. 10</td>
<td>4</td>
</tr>
<tr>
<td>M.S. or A.S.</td>
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<tr>
<td>Approved Electives</td>
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<td></td>
<td>17</td>
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<td>16</td>
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</tbody>
</table>

This program is suggestive only. Variations are permitted according to a student's objectives with the approval of his advisor and department head.

Courses

1. Farm Mechanics. Use of hand and power tools, sharpening, care and selection of tools and shop supplies. Sheet metal work; cold metal; forge work; practical farm drawing; home farm shop; and shop safety. 3 lectures, 2 labs. (5F, W) Jarrett

4. Dairy Mechanics. Basic equipment for modern dairy plants; its accessories and upkeep. Three lectures, one lab. (4F) Daines

10. Irrigation Practice. Primarily for agricultural students. Principles and practices of efficient and economic use of irrigation water. Prerequisite: Math. 34. Three lectures, one lab. (4F or S) Bagley

14. Farm Power for Agricultural Students. Principles, operation, care and maintenance of internal combustion engines and electric motors. Two lectures, one lab. (3F or S) Daines
15. Farm Machinery for Agricultural Students. Principles of mechanics and materials applied to farm machinery. Operation, adjustment, and care of agricultural machines. Two lectures, one lab. (3W or S) Daines


102. Farm Power. Operation, care and maintenance of tractors and farm engines. Diesel, L.P.G., 4-cycle and 2-cycle engines and electric motors. Three lectures, two labs. (5W or S) Jarrett

103. Farm Machinery. Selection, operation maintenance, and repair of farm machinery including materials of construction, mechanics, transmission of power, adjustment of tillage, planting, spraying, dusting, forage and harvesting equipment, brazing cast iron, welding, hardfacing and use of the carbon arc torch. Three lectures, two labs. (5F) Jarrett


109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply and farm sanitation, farm electrical systems and appliances. Three lectures, one lab. (4W) Daines

110. Irrigation Principles. Primarily for upper division students in agriculture and colleges other than Engineering. Water measurement, conveyance, and application, consumptive use of water and water requirements, pumping, drainage, and soil-water relationships. Prerequisite: Math. 34 and upper division standing. Two lectures, one lab. (3S) Hansen

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering. The student is expected to develop his initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. Staff

298. Thesis. Time and Credit arranged. (F, W or S) Staff

Chemical Engineering

The following is a suggested outline of courses for Freshmen and Sophomores desiring to major in Chemical Engineering. Students may transfer to the University of Utah, or another institution, granting a degree in Chemical Engineering, at the end of the Sophomore year.

<table>
<thead>
<tr>
<th>Freshman</th>
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<th>Sophomore</th>
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<tr>
<td>Course</td>
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<td>S</td>
<td>Course</td>
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<td>C. E. 1, 2, 65</td>
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<td>Math. 98, 99, 100</td>
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<td>Math 55', 46, 97</td>
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<td>Physics 20, 21, 22</td>
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<td>E. D. 61, 62, 63</td>
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<td>Chem. 121, 122, 115</td>
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<td>English 1, 2, 3</td>
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<td>Chemistry 3, 4, 5</td>
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<td>5</td>
<td>Economics 51</td>
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</tbody>
</table>

1Students deficient in High School mathematics, Algebra B, will have to register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have an opportunity to make up mathematics deficiency during the Summer Session between Freshman and Sophomore years.
C. H. Milligan, Professor and Head of Department; O. W. Israelsen, Professor Emeritus; A. Alvin Bishop, J. E. Christiansen*, Vaughn E. Hansen, H. R. Kepner, Dean F. Peterson, Professors; Spencer H. Daines, Reynold K. Watkins**, W. A. Cordon, Elliot Rich, Associate Professors; Jay M. Bagley, Fred W. Kiefer, Jr., Willis A. Tingeby, J. R. Barker, Assistant Professors; Frank Haws, Research Associate; Bruce H. Anderson***, Extension Irrigation Specialist, C. W. Lauritzen, Allan S. Humphreys, and Lyman Willardson, Collaborators, U. S. Department of Agriculture.

This department offers the Bachelor of Science Degree in Civil Engineering and Master's Degrees in Civil and in Irrigation and Drainage Engineering. A professional engineering degree is offered in Civil and in Irrigation and Drainage Engineering. This department collaborates with other departments in offering the Doctor of Philosophy Degree in Irrigation Science.

Civil Engineering consists of the economic application of the laws, forces and materials of nature to the design and construction of engineering structures, including irrigation and drainage systems, highways, railways, bridges, buildings, dams, water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

The carefully planned curriculum in Civil Engineering is accredited by the Engineers Council for Professional Development. It is based upon a thorough training in English, Mathematics, Physics, and Chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to many phases of Civil Engineering.

Academic work is supplemented by local field trips during the junior and senior years, and a major field trip of approximately one week duration in the senior year. These field trips provide opportunity for first-hand study of projects under investigation, construction, and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

The Civil and Irrigation Engineering department is housed mainly in the Engineering Building, where well-equipped laboratories and classrooms provide ample facilities for experimental work. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the engineering properties of soil. The materials testing laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscope.

A program of research is conducted in collaboration with Agricultural Research Service, of the U. S. Department of Agriculture under the direction of the Agricultural Experiment Station. This, together with activities of the Engineering Experiment Station, provides opportunities for qualified students to act as part-time research assistants and thereby obtain experience and compensation for their services.

Utah State University is located in the heart of the Irrigation region 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.

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*On leave Fall Quarter 1957.
**On leave 1957-58.
***Iran contract assignment 1957-1959.
### Civil Engineering Curriculum

**Degree: Bachelor of Science in Civil Engineering**

#### Freshman

<table>
<thead>
<tr>
<th>Course</th>
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<td>C. E. 1, 2, 3</td>
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<tr>
<td>T. E. 150</td>
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#### Senior

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The curriculum is accredited by the Engineers Council for Professional Development. All students will be required to complete this curriculum to obtain the B. S. degree in Civil Engineering.

### Suggested Five Year Curriculum in Civil Engineering

This curriculum is suggested for those who wish to broaden their education, for those who wish to take advanced military science or air science, or for those who are deficient in entrance requirements.

Some students may wish to obtain a better foundation in mathematics, physics, or other branch of education. Some may of necessity have to work a considerable amount of time to stay in school, or they may wish to participate in athletics or other extra-curricular activities. The 5-year curriculum is designed to meet these special needs. Students who desire the 5-year curriculum should consult their advisors to work out a satisfactory program.

#### FIRST YEAR

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### COLLEGE OF ENGINEERING AND TECHNOLOGY

#### THIRD YEAR

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#### Courses

1. **Engineering Orientation.** A preview of engineering; what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. (1F, 1W) **Staff**

2. **Slide Rule Instruction.** Practice in the use of the Log-Log slide rule. Prerequisite Math. 46 or concurrently. (1F, 1W, 1S) **Staff**

3. **Civil Engineering Orientation.** Engineering problems and lectures covering the various subdivisions of Civil Engineering. (1S) **Staff**

65. **Engineering Problems.** Practice in the solution of engineering problems including use of logarithms, slide rule, calculating machines. Emphasis is placed on good habits of work and study. Prerequisite: C. E. 2 and Math. 46. One lab. (1F or 1S) **Tingey**

80. **Office Practice: For Foresters.** Practice in preparing office plans from surveys that are encountered by the forester in working up field notes. Prerequisite: C. E. 81 or equivalent. Two labs, one lecture. (3W) **Tingey**

81. **Plane Surveying.** Primarily for Forestry students. Use of tape, hand level, level, transit, compass, and plane table. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math. 35 and 46. One lecture two labs. (3F and 3S) **Tingey**

82. **Mapping and Office Practice.** Practice in mapping various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C. E. 81 or 84. Two lectures, two labs. (4W) **Kiefer**

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1Students deficient in High School mathematics, Algebra B, will register for Math. 34, Introduction to College Algebra, Fall Quarter, and will have the opportunity to make up mathematics deficiency during Summer Sessions between Freshman and Sophomore year. Otherwise they may choose the 5-year curriculum. Students who have not had High School plane geometry must take this course without credit.

2Humanities may be selected from the following: History, economics, government, literature, sociology, philosophy, psychology, religion (accepted by the university for college credit), and fine arts.

3Technical electives may be selected from the following: C. E. 120, 121, 122, 127, 130, 131, 132, 143, 145, 147, 148, 149, 160, 181, 182. (Courses will be taught only for classes of eleven or more students).
84. Elements of Surveying. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35 and 46. Two lectures, two labs. (4F) Kiefer

85. Advanced Surveying. Problems in chaining, leveling, curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C. E. 82 and 84. Two lectures, two labs. (4S) Kiefer

101, 102, 103. Engineering Mechanics. Includes statics, dynamics, and strength of materials. Fall Quarter and part of the Winter Quarter are devoted to study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and kinematics and kinetics of bodies in translation, rotation, and plane motion. The remainder of the year is devoted to a study of mechanics of engineering materials including stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads, etc. Prerequisite: Math. 110 (or taken concurrently) and Physics 20. Three lectures, one lab. (4F, 4W, 4S) Rich or Kiefer

105, 106, 107. Structural Theory and Design. This sequence introduces the analysis and design of structures and their elements, C. E. 105 and 106 cover stress analysis and design in steel, timber, and reinforced concrete. In C. E. 107, students are given more comprehensive problems in the design of buildings and bridges. Prerequisites: C. E. 101, 102, 103. Fall and Winter Quarters, recitation daily, one lab. Spring Quarter, five recitations. (6F, 6W, 5S) Kepner

111. Advanced Dynamics and Kinematics. Kinematics of linkages, belts, gears and cams. Design of machine elements subject to dynamic loadings. Two lectures, one lab. Prerequisite: S. E. 103. (3F) Kepner

112. Stresses in Machine Elements. A study of stresses in machine parts; theories of failure; statically indeterminate stresses and deflections; thermal stresses; stress concentration. Prerequisite: C. E. 103. Three lectures, one lab. (4W) Kiefer

120, 121, 122. Highway Engineering. The Fall Quarter is devoted to general highway engineering including current aspects of the federal highway engineering program, economics, financing, surveys and plans, geometric design of rural highways, and highway drainage. The Winter Quarter deals with the subgrade structure, stabilized roads, materials of highway construction, and the design of flexible and rigid pavements. Traffic problems are studied in the Spring Quarter including the vehicle and the driver, traffic surveys, accidents, planning and design, traffic control, and regulations. Three lectures and one lab. (4F, 4W, 4S) Cordon

127. City Planning. Master plans, civic units, parks and playgrounds, utilities, housing, sub-divisions, zoning, civic centers and airports. Three lectures. Prerequisite: C. E. 120. Two lectures, one lab. (3S) Cordon

128. Non Metallic Materials. The nature and properties of non metallic engineering materials. Includes testing materials in accordance with ASTM standards. Three lectures, one lab. (4W) Cordon

130. Building Construction and Cost Estimating. Construction methods used in fabrication and creation of buildings and practice in estimating costs. 2 lectures, one lab. (3F) Kiefer

131, 132. Structural Design Problems. Problems in deflection of beams and trusses, analysis and design of statically indeterminate trusses and rigid frames. Open to seniors and to graduate students in Civil Engineering. C. E. 103 is prerequisite for C. E. 131 and C. E. 105 and 106 are prerequisites for C. E. 132. 3 lectures and one lab. (4W, 4S) Kepner

141, 142. Fluid Mechanics and Hydraulics. Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, flow of fluids in pipes and open channels, measurement of fluid flow and hydraulic principles underlying the design and selection of tangential and reaction turbines and pumps. Prerequisites: Physics 20, Math. 110 (or taken concurrently). Three lectures, one lab. (4F, 4W) Hansen
143. Irrigation Principles. For advanced engineering students. Soil, water, plant relations; water requirements, efficiency of water use; flow of water in soil. Prerequisites: C. E. 142. Three lectures, one lab. (4F, or 4S)

144. Applied Hydraulics and Pneumatics. Theory and practice in hydraulics and pneumatics as they apply to machine tools and controls. Prerequisite. C. E. 141. Two lectures, one lab. (5S)

145. Design of Drainage Systems. Drainage design in relation to soil properties, location of drains, flow of water, properties of tile, drainage construction, salinity of soil, and quality of water. Prerequisite: C. E. 142. Three lectures and one lab. (4S)

146. Design of Water Conveyance Irrigation Structures. Application of principles of solid, fluid, and soil mechanics to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C. E. 106, 142, and 150. Three lectures. (3W)

147. Design of Water Control Structures. Design of dams, diversion works, drops and chutes, spillways, wastewater, headgates, and check gates. Prerequisite: C. E. 146. Three lectures. (3S)

148. Design of Farm Irrigation Systems. Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems, for application of water by both surface and sprinkling methods. Prerequisites: C. E. 146, 143. (5S)

149. Irrigation Institutions. Laws governing acquisition, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; federal legislation affecting water. 4 lectures (4F)

150. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and the design of earth structures and foundations. Prerequisites: C. E. 103, 142. Three lectures, one lab. (4F)

151. Hydrology. (Primarily for Forestry Students.) Weather elements, factors influencing run-off, and influence of range and land-management practice on run-off and erosion. Three lectures. (3F)

152. Hydrology and Meteorology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, ground water, and runoff; methods of collection of hydrologic data and their use in water supply and flood control studies. Prerequisite: C. E. 141, or by special arrangement. Three lectures, one lab. (4W, 4S)

153. Application of Thermodynamics. For Aeronautics, and Automotive majors. Applications of laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigeration. Prerequisites: Math. 35, 44; Physics 19. Three lectures, one lab. (4W)

154. Photogrammetry. The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: E. D. 63, C. E. 81 or 86, or Senior standing in Forestry, Range or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Three lectures, one lab. (4W)

155. Route Surveying. Theory and practice in highway curves and earth work, including methods used in highway, street, canal, pipe line and general project surveys. One lecture, one lab. (2S)

156. Senior Project. Research or testing project in some phase of engineering. Student conducts minor research project under direction of faculty. Conducted cooperatively with C. E. 198 and English 111. (1W, 1S)

194. Sewerage. Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical and biological action and methods of final disposal. Prerequisite: C. E. 142. Three lectures, one lab. (4S) Kepner


196. Elementary Engineering Thermodynamics. The general energy equations, principles of the thermodynamic cycles for internal combustion engines, processes of vapors, air compression, refrigeration, and flow of fluids. Prerequisites: Physics 22 and Math. 99. Three lectures, one lab. (4F or S) Daines

198. Senior Seminar. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all Civil Engineering Seniors. One lecture. (1F, W, S) Staff

201, 202. Advanced Structural Theory. Review of elementary strength of materials, advanced topics in stress analysis involving central, torsional, and flexural loads. Open to graduate students in Civil and Irrigation Engineering and to qualified Senior students, with the approval of the instructor. (3F, 3W) Kepner

203. Advanced Structural Design. Individual problems in the design of modern structures. Checking of designs by model analysis may be selected. Prerequisite: C. E. 132. (3F, W, or S) Kepner

210. Earth and Rock-Fill Dams. Design of flexible type (earth or rock-fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. Prerequisite: C. E. 150. (3W) Milligan

211. Masonry Dams. Design of rigid type dams. Stress, analysis and design of gravity, gravity-arch, multiple arch, and deck types of masonry dams. Timber, steel, and miscellaneous types are also considered. For graduate students and specially prepared seniors. Time arranged. Prerequisite: C. E. 103. (3F) Bishop

212. Appurtenances to Dams and Operation of Reservoirs. Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation. For graduate students and specially prepared seniors. Prerequisite: C. E. 142. (3S) Staff

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. 142. Time arranged. (3W) Staff

220, 221, 222. Advanced Highway Engineering. Economics of location and design, selection, improvement and maintenance, traffic control, administration and finance, and jurisdiction as applied to highways. Prerequisite: C. E. 122. (3F, W, S) Cordon

230. Special Problems in Civil, Irrigation or Drainage Engineering. Independent study of a chosen problem under the direction of a member of the department staff. The student is expected to develop his initiative in pursuing these problems. Formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. Staff

231, 232. Irrigation Science. Advanced study in irrigation including such topics as consumptive use of water, soil moisture, irrigation, erosion, and land management, infiltration, permeability, and other irrigation engineering principles and practices. (3W, 3S) Bishop, Milligan

243. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: C. E. 142 and 147. (3S) Hansen

245. Advanced Design of Drainage Systems. Measurements of field permeability, hydraulics of wells, pumping for drainage, leaching and reclamation of saline soils, etc. (3W) Bishop

250. Advanced Soil Mechanics. Theories of seepage, capillarity, stress, consolidation, and stability are developed and applied to the practical design and construction of earth structures. Interpretation of laboratory tests is given special attention. For graduate students and specially prepared seniors. Prerequisite: C. E. 150 or its equivalent. (3S) Watkins


273. Advanced Hydrology. Application of basic hydrologic principles to engineering investigations. Application of the unit hydrograph, infiltration analysis, hydrograph analysis, streamflow routing for reservoir operation and control, use and storage of groundwater. For graduates and specially prepared seniors. Prerequisite: C. E. 173. Three lectures. Credit arranged. Milligan

295. Sanitary Design. Principles of design, construction and operation of water purification and sewage treatment plants. Prerequisites: C.E. 193, 194. (3W or S) Kepner

298. Graduate Thesis. Time and credit arranged. Each quarter. Staff
299. Graduate Seminar. Time arranged. (1S) Staff

Advanced Degrees in Irrigation and Drainage

The program of study for either the degree of Master of Science in Irrigation and Drainage Engineering or for the professional degree of Irrigation Engineer depends upon the student’s previous training and experience. It should contain basic sequence courses to strengthen the undergraduate program and to provide adequate training in irrigation and drainage. Since students come to this institution with different objectives, no rigid curricula can be suggested for advanced degrees. Typical programs of study for students having the Bachelor of Science degree in either Agricultural Engineering or Civil Engineering leading to the Master of Science degree in Irrigation and Drainage Engineering or the degree of Irrigation Engineer are as follows:

Typical Programs of Study for the M.S. Degree in Irrigation and Drainage Engineering

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Typical Programs of Study for the Degree of Irrigation Engineer

**FIRST YEAR**

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**SECOND YEAR**

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Total: 16 16 16

These typical programs are suggestive only. Variations are permitted according to a student's previous training and his objectives so long as the general requirements of the department and the Graduate School are satisfied. These general requirements are described under, "Graduate School." Similar programs may be arranged for the degrees of M.S. in Civil Engineering and for Civil Engineer.

**ELECTRICAL ENGINEERING**

Larry S. Cole, Professor and Head of Department; Clayton Clark, Bertis L. Embry, Professors; William L. Jones, Bruce O. Watkins, Associate Professors; Duane G. Chadwick, Assistant Professor; Robert A. Heyborn, Instructor.

The curriculum in Electrical Engineering is accredited by the Engineer's Council for Professional Development.

The four year program listed below leads to the Degree of Bachelor of Science in Electrical Engineering, with emphasis in the field of general electronics.

Laboratory work in small groups is an organized part of most courses to provide physical confirmation of basic principles; familiarity with commonly used components, instruments and equipment; and to make possible closer relationships between teacher and student and between students. It is believed than an increased degree of understanding and retention results through this program.

The prescribed course of study includes mathematics and basic science, engineering science, engineering analysis and design, basic communication and humanistic-social studies. A reasonable choice of elective subjects is provided to allow the student to pursue studies of special individual interest. Provision for additional mathematics is made for students who plan graduate study.
For students who plan to participate in the Advanced Military Program, Athletics, work part-time, or who desire a broader and less intense program, a five year course of study leading to a B.S. degree is also available.

**Graduate Study**

The Masters Degree program in Electrical Engineering is basically general, covering circuits, waves and fields, with supporting mathematics, and physics. Some specialization is available in the fields of radio propagation, servo-mechanisms, computer fundamentals, microwave measurements, and transistor circuitry.

A suggested course of study is listed below which will lead to the M.S. degree. Modification may be made, depending on the individual student's preparation and objectives.

**Electrical Engineering Curriculum**

**Degree: Bachelor of Science in Tool Engineering**

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**Senior**

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**Suggested Course of Study Leading to the Degree of Master of Science in Electrical Engineering**

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¹Electives must be approved by Department Head.

²May be selected from the following: history, economics, government, literature, philosophy, fine arts, and non-sectarian religion.
Courses

21. Fundamentals of Electricity. A service course for students in Industrial Arts, Automotive, Welding, etc. Basic principles of practical and applied electricity; DC and AC circuits; power; wire and wiring; motor, generator and transformer principles; batteries; meters. Prerequisites: Math. 34 or equivalent. Three lectures. (3F, 3W, 3S)

22. Fundamentals of Electricity Lab. A laboratory course to accompany E. E. 21. Demonstrations and experiments on basic electric principles, circuits and equipment; problem sessions. One lab. (1F, 1W, 1S)


101. Electronics. A special course for senior or graduate science majors and non-electrical engineers. Fundamentals of electric and electronic circuits; applications to the electrical measurement of physical quantities. Prerequisites: Physics 21 and Elementary Calculus. Three lectures, one lab. (4F)

104. Fundamentals of Electrical Engineering—Circuits. For non-electrical engineers. Principles and analysis of DC and AC circuits. Electric and magnetic fields and circuits. Prerequisites: Calculus and Physics 21. Two lectures, one lab. (3F)


107. Electrical Machinery I. An introductory course covering the basic principles of Electrical Machinery; magnetic circuits; DC machines; AC power circuits, polyphase circuits, power transmission and distribution. Prerequisite: E. E. 81. Three lectures, one lab. (4F)

108. Electrical Machinery II. A continuation of E. E. 107 with special emphasis on AC machines. Transformers; single and polyphase systems and machines; control equipment. Prerequisite: E. E. 107. Three lectures, one lab. (4W)

110. Lines and Filters. Principles and characteristics of transmission lines, networks, matching sections and filters. Prerequisite: E. E. 81. Three lectures, one lab. (4S)

120. Antennas. Fundamentals of antennas, radiation and wave propagation directional arrays; feed lines and matching and phasing networks; antenna and field strength measurements. Prerequisite: E. E. 110, 139. Three lectures, one lab. (4S)
124. **Fundamentals of Electronics.** Analysis of the principles, characteristics and operation of electronic devices utilizing basic physical laws and concepts of modern physics; includes study of thermionic emission, vacuum and gas tubes, photoelectricity, semiconductors and transistors. Prerequisites: E. E. 81, Math. 110 (concurrent registration in Physics 120 is desirable). Three lectures, one lab. (4F) 

125. **Electronic Circuits I.** Principles and design of low pass tube and transistor voltage amplifiers; Class A, AB and B power amplifiers; feedback principles and feedback amplifiers. Prerequisite: E. E. 124. Three lectures, one lab. (4W) 

126. **Electronic Circuits II.** Principles and design of tube and transistor tuned amplifiers; RF power amplifiers and oscillators; modulation and detection in AM and FM systems. Prerequisite: E. E. 125. Three lectures, one lab. (4F) 

129. **Elecroacoustics.** Fundamentals of architectural acoustics: Theory and principles of electromechanical transducers including loudspeakers, microphones and vibration pickups; recording methods and equipment; measurement techniques in acoustic and electromechanical systems. Prerequisite: E. E. 125, 131. Three lectures, one lab. (4W) 

131. **Transient Analysis.** Elementary study of transient phenomena in linear systems; formulation of the circuit differential equations and their solutions; the Laplace transform and operational methods are stressed; network analysis. Prerequisites: E. E. 110 and Math. 110. (3F) 

139. **Fundamentals of Electric Waves.** Introduction to vector analysis; elementary electromagnetic field theory; Maxwell's equations; radiation and wave guides. Prerequisite: E. E. 110 and Math. 110. (3F) 

140. **Pulse Techniques.** Principles and design of pulse and wide band amplifiers; pulse generators, multivibrators and related circuits. Prerequisites: E. E. 131, 139. Three lectures, one lab. (4W) 

141. **Microwaves.** Fundamental principles of microwaves, generators and cavity resonators; wave guides, parabolic and horn radiators; microwave transmission and propagation; measurements in the microwave region. Prerequisites: E. E. 139, 140. Three lectures, one lab. (4S) 

150. **Instruments and Measurements.** The principles and application of electrical and electronic instruments; methods and techniques of measurements. Prerequisite: (or concurrent registration in) E. E. 124. One lecture, one lab. (2F) 

151-2-3. **E. E. Project Laboratory.** Individual engineering assignments involving design, development, construction and testing of various types and units of electronic and communications equipment. A formal engineering report is required on each project. Prerequisite: Senior standing in E. E. Two labs. (2F, 2W, 2S) 


175, 176, 177. **Electrical Engineering Seminar.** A weekly meeting of staff and senior E. E. majors. Reports and discussions on recent developments in electronics and communications. Each student prepares and presents a technical paper on a suitable topic. (1F, 1W, 1S) 

180. **Transistors.** An introduction to the theory, principles and characteristics of transistors. Fundamental applications of transistors; circuitry, analysis and design. For senior or graduate E. E. majors. Prerequisites: E. E. 139, and Physics 120. Three lectures, one lab. (4S)
200. Special Studies in Electrical Engineering. Preparation of professional papers and reports, research, and special problems. Open to senior E. E. students of high standing or graduate students. Time and credit arranged. 

Staff

211, 212. Advanced Electronic Circuits. Pulse techniques and recurrent electrical transients. Generator, trigger, multivibrator and similar circuit theory and design. Theory and design of high-speed pulse amplifiers. Wide-band and bandpass amplifiers. Amplifier noise problems. Prerequisite or concurrent registration in E. E. 131 or equivalent. Three lectures, one lab. (4F, 4W)

Clark

222, 223. Network Synthesis. The mathematical basis and design methods for two and four terminal passive networks having physically realizable driving point emittances. Prerequisites: Math. 254 and E. E. 131. Three lectures. (3W, 3S)

Jones


Clark

251. Servomechanisms and Automatic Controls. Basic theory and design of servo systems. Transient response and stability problems. Computer fundamentals. Prerequisite: E. E. 131 or equivalent. Three lectures, one lab. (4S)

Watkins


Staff

TOOL ENGINEERING

Frederick Preator, Professor and Head of Department; Rawson D. Child, Assistant Professor.

The department offers a four-year curriculum that leads to the degree of Bachelor of Science in Tool Engineering. The present demand for capable tool engineers is greater than the supply of personnel qualified to take over production responsibilities.

Tool Engineering is a branch of engineering devoted primarily to planning the process of economic manufacture; the art and science of analyzing, planning, designing, construction, and producing tools for manufacturing industries. The tool engineer handles the more specialized activities of process engineering, machine design, tool design, plant and layout engineering, gage engineering, manufacturing cost estimating, machine tool building, and maintenance engineering.

The Tool Engineering laboratories are equipped with eighteen engine lathes, three universal and one vertical milling machine, one planer, three shapers, four precision tool grinders, six drill presses, five tool grinders, one carbide tool grinder, one DoAll machine, two punch presses, and one power hack saw. The laboratory is well supplied with all the necessary hand tools for precision work. The heat treatment laboratory is equipped with five electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. A modern inspection laboratory has gage blocks, sine bars, electric comparators, polishing heads and microscopes for mechanical inspection work.

A joint program of cooperative training with Utah industries has been worked out for advanced students which permits registration for summer periods. Field trips to industrial plants are conducted each year for junior and senior students. Senior field trip, transportation fee $30.00.

Student Chapter No. 2 of the American Society of Tool Engineers, promotes the professional and social interests of the tool engineering majors. Members of the teaching staff are qualified members of the national society.
## Tool Engineering Curriculum

### Degree: Bachelor of Science in Tool Engineering

#### Freshman

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### Courses

50. **Orientation.** Lectures, films, and field trips to acquaint the student with diverse opportunities for the tool engineer in industry. (1S) **Staff**

51, 52. **Machine Tool Operation.** Training in use of hand tools, and in bench work and tool sharpening, together with elementary training on drill press and engine lathe. Reading assignments on machine tool operations, and applications of mathematics to machine tool problems are included. (4F, W or S) **Child**

53, 54. **Machine Processes.** (Shaper and Milling Machines) Introduction to work on the shaper, planer, and milling machines prepares the student for advanced operations. (3F, W) (54 taught fall quarter only) **Preator, Child**

56. **Machine Lab for Engineers.** Acquaints engineering students with basic machine tool operations. (3S) **Staff**

57. **Quality Inspection and Control.** Theory and practice of precision control of the manufactured product. Students learn the use of precision equipment, to read material specifications, and to maintain quality control during the production cycle. Prerequisite: Math. 44 or 46. (2W) **Preator**

58. **Manufacturing Processes.** Teaches the student the fundamentals of such manufacturing processes as foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; shows possibilities and limitations of these processes and their application to fabrication of industrial products. (2S) **Child**

160. **Engineering Metallurgy.** Physical properties, composition, constituents, and heat treatment of metals used in industry, including cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. Prerequisite: Chemistry 10. Three lectures, one lab. (4F, W, S) **Preator**

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¹ and ² See footnotes pages 189 and 196.
151. Tooling Operations. Develops for the student an understanding of the capacity and versatile usefulness in production operations of the fundamental machines and equipment used in the manufacturing operations. Prerequisite: T. E. 52 and 53. Two lectures, two labs. (4F, W) Child

152. Tool Planning. Analysis machining processes and organization of operational sequence. Tool planning procedures and routing for production control. Prerequisite: T. E. 151. Two lectures, two labs. (4W) Child

153. Tool Processes. Introduction to tool and gage and die processes. The student studies and makes specialized tools and equipment necessary for the design and construction of projects in the tool and die industry. Required of all major students. Two lectures, two labs. (4S) Child

158. Manufacturing Analysis. Economics of tooling operations; the productivity of machines, different tooling methods, fabrication techniques, breakdown of operations, tool maintenance, tool costs, and job estimating. (3S) Child

181. Tool Design. The study and design of such production tools as gages, jigs, and fixtures. Includes tool design standards, tolerances, springs, details of jigs, cam layouts, and techniques of preparing tool drawings. Each student designs and constructs a set of tools for production of a specific workpiece. Emphasis on development of creative ability and originality. Prerequisite: C.E. 103. Two lectures, three labs. (5F, 5W) Preator; Child

182. Die Design. Types of manufacturing operations and design problems for production tooling. Emphasis is placed on plastic working of metals. Two lectures, three labs. (5S) Staff

183. Plant Layout. Study of the utilization of space, machining, and equipment for economical production in manufacturing operations. Laboratory consists of organizing and planning details for layout of production operations. Two lectures, three labs. (5S) Preator

184. Seminar. A review of current technical literature dealing with the latest production methods. Oral and written reports presented for discussion. (1W, or S) Preator

185, 186. Co-operative in Plant Training. A co-operative training course conducted by the university and industry to supplement the student's academic work with plant experience and to qualify him for industrial opportunities. Arranged (6). Staff

Two-Year Curriculum Leading to Certificate of Completion in Machine Tool Technology

The two-year terminal curriculum prepares young men who have mechanical interests and abilities to become skilled craftsmen and technicians. Operations performed in the two-year terminal course are the same as those required in industrial shops. Mechanical drawing and blue print reading are essential in the Machine Tool curriculum. Capable and efficient craftsmen are rarely out of employment in the manufacturing industries.

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By act of the Board of Trustees of the Utah State University, 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 University.

(10) To publish and distribute through bulletins, circulars, and technical articles in periodicals the result of such studies, surveys, tests, investigations and researches as will be of greatest benefit and interest to the people of Utah.

The Engineering Experiment Station is an integral part of the College 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, College of Engineering and Technology.

Division of Technology

The Division of Technology includes four departments: Aeronautics, Automotive, Industrial Education and Welding. Beginning as a Department of Mechanic Arts in 1888, the division has expanded and developed as a result of efforts of the University to provide for the “liberal and practical education of industrial classes” as outlined in the original charter for Land-Grant Colleges and Universities.

This division offers three major programs:

I. Industrial Technology Program. Present-day industry requires services of engineers, technicians, and skilled craftsmen. The Industrial Technology program is a four-year technical program leading to the degree of Bachelor of Science in Industrial Technology. The training provided combines technical knowledge and manual skills with a broad general college education. This program prepares technicians for technical, supervisory, or managerial positions in modern industry and is an excellent foundation for entrance into industrial Civil Service positions, or for private business. Prescribed curricula under this program are described under the departments in which they are offered.
II. Industrial Education Program. This program, offered by the Department of Industrial Education, gives professional training for teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and the Summer Season. Completion of the under-graduate curriculum leads to the degree of Bachelor of Science in Industrial Education with majors in Industrial Arts Education for junior and senior high school positions, and Trade and Industrial Education for junior college and vocational school positions.

Graduate study leading to the degree of Master of Science in Industrial Education is also offered.

III. Vocational Technical Program. This program prepares skilled technicians for modern industry. Completion of the two-year curricula, listed under the departments in which they are offered, leads to a Certificate of Completion in the specific field. This program is briefer and more specialized than the degree program.

This program is offered in close co-operation with the State Department of Public Instruction, and with industry. Problems of training and placing of students are considered jointly with advisory committees representing the trade. Instruction covers the practices of industry with emphasis on latest methods, modern equipment, and live productive work. The instructors all have years of successful trade experience in their field.

The Vocational Technical Program offers many distinct advantages to students desiring terminal education. Students completing this program are not only well prepared with the skills of their trade to enter modern industry, but they are also prepared, through their association and activities on a college campus, to take their place in society. Students entering industry from this training program have opportunities for further progress and advancement in industry, as has been demonstrated by many industrial leaders. By returning to this institution for further training, qualified students may apply most of the credit earned under this program toward a degree, and thus better prepare themselves for supervisory and managerial positions.

AERONAUTICAL TECHNOLOGY

Lowell P. Summers, Associate Professor and Acting Head; Samuel W. Merrill, Instructor.

This department offers instruction for thorough training of skilled airframe and powerplant mechanics and aeronautical technicians.

The Aeronautics Department is a fully certified Air Agency complying with Civil Aeronautics Authority regulations and holds Certificate No. 1175 covering training of combined Airframe and Powerplant Mechanics. The curricula, equipment, and instructors have been properly certified in compliance with regulations for the training of Airframe and Powerplant Mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Airframe and Powerplant mechanic ratings. This training prepares graduates for both airframe and powerplant maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in aeronautics with a general college education. Training is based upon the objective of scientifically and systematically developing students to a point where they can assume responsible positions in the industry. Students graduating in the four-year curriculum are required to have successfully accomplished the written and practical C.A.A. examinations for Airframe and Powerplant Mechanic ratings.

Facilities include complete laboratories and modern equipment for instruction in powerplants, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.
### Aeronautical Technology Curriculum

#### Freshman

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<th>Course</th>
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<td>Aero. 5, 6, 7</td>
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<tr>
<td>Math. 34*, 35, 46</td>
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<tr>
<td>English 1, 2, 3</td>
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<tr>
<td>T.E. 56</td>
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<tr>
<td>Weld. 92</td>
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<td>E.E. 21</td>
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*Electives must be approved by department head. May include advanced military or on the mathematics entrance examination may omit Math. 34 and begin with Math. 35.

#### Sophomore

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<td>Aero. 8, 9, 10</td>
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<td>E.D. 61, 62, 63</td>
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<td>Physics 17, 18, 19</td>
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<td>A.S.</td>
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<td>Chem. 10, 11</td>
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<td>English 112</td>
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<td>Aero. 100, 105, 134</td>
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<td>I.E. 120</td>
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*Electives must be approved by department head. May include advanced military or air science.

#### Senior

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<td>Econ. 125</td>
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<td>C.E. 176</td>
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<td>Aero. 131, 130, 37</td>
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<td>Speech 5</td>
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#### Two-Year Vocational Program

Certificate of Completion in Airframe and Powerplant mechanics will be granted on satisfactory completion of the 2-year freshman and sophomore curriculum listed above and the Civil Aeronautics Authority's written and practical examination in Airframe and Powerplant Mechanic Ratings. Application for graduation and payment of diploma fee through the Registrar's Office is required for a 2-year certificate of completion.

#### Courses

**5, 5a. Composite Aircraft Structure.** Design, construction, repair, and maintenance of composite aircraft, including wood structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. (4 lect. 4 lab. F) Merrill

**6, 6a. All-metal Aircraft Structures.** Design, construction, repair, and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. (4 lect. 4 lab. W) Merrill

**7, 7a. Aircraft Maintenance.** The maintenance, repair, and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, instruments, electrical equipment and installation, and general servicing of components; rigging, weight and balance computations, periodic inspections, recording of repairs and alterations, time and material cost estimates, material and equipment requirements. Pertinent Civil Air Regulations are studied. (4 lect. 4 lab. S) Merrill
8, 8a. Aircraft Powerplants. Repair, maintenance, and operation of modern air-cooled and liquid-cooled aircraft engines, including design, disassembly and reassembly procedures, special tools and their application, power sections, accessory sections, supercharger sections, cylinder and valve mechanisms, and pertinent Civil Air Regulations. Basic related material includes a study of specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, inspection methods, materials and processes, volumetric efficiency, and compression ratios. (4 lect. 4 lab. F) Summers

9, 9a. Aircraft Powerplant Accessories. Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel injection systems, lubricating systems, magnetos, generators, and voltage control systems, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism, induction systems and superchargers, fuels and lubricants. (4 lect. 4 lab. W) Summers

10, 10a. Aircraft Powerplant Maintenance. Training in alteration, maintenance and operation of aircraft powerplants, including periodic inspections, servicing, diagnosis of engine malfunctioning, and engine installation. Theory of operation and design characteristics of controllable, constant speed, hydromatic, electric and reversible propellers. Overhaul and maintenance of propellers. Pertinent Civil Air Regulations. (4 lect. 4 lab. 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: Aero. 10. Two lectures, one lab. (3F) Staff

101. Flight Engineering. Principles underlying relationships between altitude, power output, airplane performance, and the use of engine power curves, take-off and climb charts, cruising charts and flight logs. Three lectures, one lab. (4F) Summers

102. Advanced Turbo Jet Propulsion and Gas Turbines. Extension of fundamental theory, axial and centrifugal flow compressors, gas turbines, burners, and jet propulsion. Prerequisite: Aero. 100. Two lectures, one lab. (3F) Staff

103. Elementary Aircraft Design. Basic constructural concepts relating to aircraft design. Three lectures. (3S) Staff


105. Aircraft Woods and Plastics. Analysis of materials as applied to aircraft. Emphasis on investigation and development of methods involving design criteria. Two lectures. (2W) Staff

126. Airline Maintenance and Fixed Base Operations. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Administration; interline agreements promotion and publicity. Two lectures. (3W) Staff

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. Two lectures. (2F, 2W, 2S) Staff

131. Time and Motion Study. Techniques of time and motion study and their inter-relationship. Detailed discussion and practice with process charts, multiple-activity charts. Therblig check list, motion economy and stop-watch time study. Methods of application and personnel problems involved. Three lectures. (3F) Staff
132. Airport Planning. The airport and the community airway and airport traffic control. Airport types, fundamental requirements, planning and construction. Lighting, building and hangar design. Special problems and miscellaneous facilities. Three lectures. (3S) Staff

134. Aircraft Electrical Systems and Equipment. The more complex electrical systems used in larger aircraft. Three lectures, two labs. (4S) Summers

Ground School Courses

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Two lectures. (2F, 2W or 2S) Staff

32. General Service and Operation of Aircraft. Aeronautical Ground School (Primary). Theory of flight, inspection, care and maintenance of aircraft and engines. Two lectures. (2F, 2W or 2S) Staff

34. Navigation. Maps, charts, and navigational problems. Required by the C.A.A. for any pilot rating above private. (3F, 3W or 3S) Staff

Flight Courses

Students interested in flight courses should take Physics 16, Introductory Meteorology which is required by the C.A.A. for pilot rating above Private Pilot Certificate.

37. Private Pilot Certificate. Flight School Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certification. Prerequisite: Aero 31 and 32. (F, W or S) Credit arranged, limit 3 credits. 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, 34 or Private Pilot Certificate and Aero 34, and Physics 16, Meteorology. (F, W or S) Credit arranged. Limit 10 credits. Staff

AUTOMOTIVE TECHNOLOGY

Owen Slaugh, Associate Professor and Head of Department; Ivan E. Lee and Lynn R. Willey, Assistant Professors; Clyde Hurst, Instructor.

This department offers a Bachelor of Science Degree in Industrial Technology with majors in Automotive Technology, or Diesel Technology. It also provides general service courses for students in other departments who desire to become familiar with various phases of automobile education. In cooperation with the Industrial Education Department courses are offered in Driver Educational Teacher Training.

Facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the most modern servicing and testing equipment, and provide ideal conditions for study.

The course of study in Automotive or Diesel Technology prepares a student to be a technician who can better interpret the designs of the engineers and direct the work of repairmen. This major also prepares students to become shop foremen, shop superintendents, and with special preparation, school instructors. Excellent background is provided for entrance into civil service, private business, and managerial positions with large companies.

Students desiring to prepare themselves more thoroughly for advanced study in related engineering, may do so by registering for mathematics and engineering courses as electives during their junior and senior years. Recommendations will be made by the adviser for engineering and humanities courses.
# Automotive Technology Curriculum

## Freshman

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<th>Course</th>
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<tr>
<td>Auto 1, 2, 3</td>
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<td>Math. 34*, 35, 44</td>
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<td>English 1, 2, 3</td>
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<td>Weld 94, 91, 190 or 191</td>
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<tr>
<td>C.E. 2, Auto 54</td>
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<td>Chem. 10, 11, 12</td>
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<td>E.D. 61, 62, 63 or 93</td>
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<td>E.E. 21</td>
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<td>T.E. 51 or 56</td>
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<tr>
<td>Auto 61</td>
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<td>Auto. 162</td>
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<td>Econ. 51</td>
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<td>Physics 17, 18, 19</td>
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<td>I.E. 113</td>
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<td>I.E. 120 or Psy. 155</td>
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<td>P.H. 155 or Zool. 111</td>
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<td>Econ. 125 or BA 155</td>
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<td>English 112</td>
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<td>B.A. 109, 147, 148</td>
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## Diesel Technology Major

Substitute Auto 21, 22, 23, 122, and 123 for Auto 1, 2, 3, 102, and 103.

## Two-Year Vocational Technical Program

Certificate of completion in Automotive Repair, Diesel and H. D. Mechanics, and Auto Body Reconditioning will be granted, upon application and payment of diploma fee, to students completing the Freshman and Sophomore years of the respective curricula.

## Auto Body Reconditioning—Two Year

Substitute Auto 52, 53, for Auto 2; Auto 12, 13, and 16 for Auto 4, 5, and 6; Auto 62 for Chem. 12.

## Service Courses

Courses open to any student: Auto 51, 52, 53, 54, 61, 62 and 162.

### Courses

1. **Steering Correction.** (Technical and Shop) Construction, operation, and repair of all parts of the automobile chassis. Units studied are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, and hydraulic brakes. Modern methods of repair. (6F, W) Willey

2. **Automotive Engines.** (Technical and Shop) Construction, operation, and repair of the modern automobile engine, including cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. (6F, W) Lee


*Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.*

5. Auto Electrics. (Technical and Shop) Construction, operation, and repair of electric systems used on modern automotive equipment, including the battery, lighting system, ignition systems, starting and generating systems. Modern methods of repair. (6F, W) Slaugh

6. Motor Tune-up. (Technical and Shop) Correlates the work covered on engines, carburetion and electrics. Tests for troubles are made with modern tune-up equipment; these troubles remedied by trade-accepted methods. Prerequisites: Auto 2, 4, 5. (6S) Slaugh

12. Fender Reconditioning. (Technical and Shop) Roughing out, shrinking, leading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfaces. (6F) Willey

13. Body Reconditioning. (Technical and Shop) Construction and repair of automobile bodies. Units include checking and alignment of automobile bodies and repair and replacement of damaged body panels such as the dash, cowl, trunk, rocker, floor, side, top and door panels. Prerequisite: Auto 12. (6W) Willey


21. Heavy Duty Chassis. (Technical and Shop) Construction, operation, and repair of automotive diesel and heavy-duty chassis. Units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (6S) Hurst

22. Automotive Diesel Engines. (Technical and Shop.) Construction, operation, and repair of automotive diesel engines, including two-stroke cycle and four-stroke automotive, truck and tractor engines and their accessories. (6W) Hurst

23. Heavy-Duty Drives. (Technical and Shop.) Construction, operation, and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (6F) Hurst

51. Automobile Chassis. Principles and practice in construction, operation, and servicing of the modern automobile chassis. Units of the course include axle, wheel suspension, steering gears, frames, springs, universals, drive shafts and brakes. Open to any college student. Two lectures, two 2-hr. labs. (3F) Hurst

52. Automobile and Farm Power Plants. Principles and practice in construction, operation and servicing of the modern automobile and farm power plants. Units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmission, overdrive, fuel, cooling and lubrication system. Two stroke, four stroke and diesel cycles considered. Open to any college student. Two lectures, two 2-hr. labs. (3S) Lee

53. Automobile and Farm Engine Electricity. Principles and practice in the construction, operation, and servicing of electrical systems used on modern automobiles and farm engines. Units studied include starting, generating, lighting, ignition, and special accessory systems. Open to any college student. Two lectures, two 2-hr. labs. (3W) Slaugh


61. Body and Fender Repair. Principles and practices in fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. Two lectures, two 2-hr. labs. (3W) Willey

101. Frame, Suspension and Steering Systems. (Technical and Shop.) Geometry and design factors of the various types of steering units including power steering, differential and brake steering, wheel balancing, frame alignment, and power brakes. Prerequisite: Auto 1. Math. 34, 44. (3W) Hurst

102. Internal Combustion Engines. (Technical and Shop.) Design and operational characteristics of different engine types. Attention is given such items as combustion chamber design, precision cylinder and bearing boring, engine balancing, valve actuating mechanisms, determination of bearing loads, inerita and centrifugal forces and production of engine parts. Prerequisite: Auto 2, Math. 35, 44. (3W) Lee

103. Automatic Transmission. (Technical and Shop.) Development of fluid couplings, torque converters, transmissions, electric clutches, and hydraulic valve control systems. Tests and trouble diagnosis procedures emphasized. Prerequisite: Auto 3. (3W) Hurst

122. Fuel Injection Systems. (Technical and Shop.) Design, operation, and servicing of diesel and gasoline injection systems. Includes air and solid types injection. Turbulence requirements of induction are considered. Prerequisite: Auto 22, Physics 19. (3W) Hurst

123. Hydraulic Drives and Special Differentials. A study of history and development of hydraulic clutches and transmissions used on trucks and buses. Consideration is given to unique gear designs, strength tests of materials, torque arms, radius rods, angular drives, and the evolution of differential gear design. (3S) Hurst

151. Carburetion. Technical training in fuels and combustion processes related to internal combustion engines. Emphasis is given to cycle analysis and associated carburetor problems affecting combustion. Prerequisite: Auto 4 or equivalent. Two lectures, one 3-hr. lab. (3F) Slaugh

152. Motors, Generators, and Magnetos. Technical training in construction and operation of electrical testing equipment used with the major electrical units of the automobile. Emphasis is given in industrial testing procedures and practices. Principles and practices in construction, operation, and repair of magnetos. Prerequisite: Auto 55 or equivalent. Two lectures, one 3-hr. lab. (3W) Lee

154. Seminar and Special Problems. A systematic review of the automotive field with discussions and reports on recent developments. Lab. analysis of special problems encountered in automotive work. Prerequisites: Auto 151 and 152. Two lectures, two 2-hr. labs. (3S) Slaugh

162. Metal Refinishing. Principles and practice in preparing metal for refinishing. Fundamental procedures in priming, surfacing, and applying lacquer, enamel, and a variety of novelty finishes. Two lectures, two 2-hr. labs. (3F, 3W) Willey

INDUSTRIAL EDUCATION

William E. Mortimer, Professor and Head of Department; Charles N. Merkley, Associate Professor; Dan H. Swenson, Charles W. Hailes, Lynn Willey, Assistant Professors; H. M. Wadsworth.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. In addition, courses in woodwork and building construction are offered in this department. Students who complete their undergraduate courses receive a Bachelor of Science degree in Industrial Education with a major in Industrial Arts Education, or Trade and Industrial Education. Those completing the curriculum in Woodwork and Building Construction receive a Bachelor of Science Degree in Industrial Technology with a major in Building Construction.
The Master of Science degree in Industrial Education is offered with majors in Industrial Arts Education or Trade and Industrial Education. All courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments except I.E. 112, 113, 121, 129, 141, 142, 143, 144, 145, 161, 162, 163, 171, 172, 173, 174 and 184. Courses in the 200 series are intended strictly for graduate work. Registration in these courses requires approval of the major professor and the instructor concerned. None of the courses in Woodwork and Building Construction are applicable to the Masters Degree.

INDUSTRIAL ARTS

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Industrial Arts certificates, and is composed of courses in arts, sciences, education, industrial arts technical and professional, and basic shop skills. The catalog description of each course in the curriculum is printed in the description of courses for each department offering the various courses.

Industrial Arts Education Curriculum

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TRADE AND INDUSTRIAL EDUCATION

The trade and industrial program is designed primarily for instructors and supervisors in Vocational Technical Education and/or Vocational Industrial programs. A candidate for the degree of Bachelor of Science in Industrial Education must show evidence of successful trade and teaching experience, together with the general education requirements necessary for state certification in his field. Observation and directed teaching in the major and minor subjects may be substituted for teaching experience. The trade and teaching experience must be approved by a committee consisting of the department heads concerned.

^Students who have completed high school Algebra B and who make satisfactory grades on the mathematics entrance examination may omit Math. 34 and begin with Math. 35 in Fall Quarter.

^Electives must be approved by Department Head.
Trade and Industrial Education Curriculum

Freshman  
Course  | F | W | S  
Trade Training  | 6 | 6 | 6  
English 1, 2, 3  | 3 | 3 | 3  
Math. 34, I.E. 6  | 3 | 3 | 3  
Engr. Dr. 61, 62, 63  | 3 | 3 | 3  
Art 1 or 30  | 3 | 3 | 3  
A.S., M.S., or P.E.  | 1 | 1 | 1  

Sophomore  
Course  | F | W | S  
Trade Training  | 6 | 6 | 6  
Phys. Sci. 31, 32, 33  | 3 | 3 | 4  
Bot. 1, Physio. 4  | 5 | 5 | 5  
Psy. 53  | 5 | 5 | 5  
Approved Electives  | 2 | 2 | 2  
A.S., M.S., or P.E.  | 1 | 1 | 1  

Junior  
Course  | F | W | S  
English 41 or 54  | 5 | 5 | 5  
Econ. 51  | 5 | 5 | 5  
Psy. 102, Soc. 70  | 5 | 5 | 5  
Adv. Trade or Tech.  | 5 | 5 | 5  
I.E., 101, Ed. 113  | 1 | 1 | 1  
I.E., 120, 118  | 3 | 3 | 3  
Electives  | 3 | 3 | 3  

Senior  
Course  | F | W | S  
I.E. 107, 110  | 3 | 3 | 3  
I.E. 129, 121  | 3 | 3 | 3  
I.E. 112  | 8 | 8 | 8  
I.E. 102  | 3 | 3 | 3  
English 112  | 3 | 3 | 3  
Econ. 125  | 3 | 3 | 3  
Adv. Trade or Tech.  | 3 | 3 | 3  
Electives  | 4 | 4 | 4  

16 16 16  

If a high school teaching certificate is desired, Edu. 114 and Public Health 155 must be included among the electives.

INDUSTRIAL MANAGEMENT

See College of Business and Social Sciences.

WOODWORK AND BUILDING CONSTRUCTION

This program offers courses in the fundamentals of woodworking, building construction, estimating and contracting, cabinet work, wood finishing and home mechanics. It offers a curriculum leading to the degree of Bachelor of Science in Industrial Technology with a major in Building Construction. It also provides general courses for any student desiring work of this nature and for students registered in Industrial Arts Education who need woodwork in their curriculum.

Building Construction Curriculum

Freshman  
Course  | F | W | S  
English 1, 2, 3  | 3 | 3 | 3  
Engr. Dr. 61, 62, 63  | 3 | 3 | 3  
Math. 34, 35, 44  | 3 | 3 | 3  
I.E. 64, 65, 66  | 3 | 3 | 3  
Art 1, 22, 26  | 3 | 3 | 3  
M.S., A.S., or P.E.  | 1 | 1 | 1  

Sophomore  
Course  | F | W | S  
Chem. 10, 11  | 5 | 5 | 5  
E.E. 21  | 3 | 3 | 3  
E.E. 22  | 1 | 1 | 1  
Engr. Dr. 94, 93  | 3 | 3 | 3  
I.E. 62, Econ. 51  | 3 | 3 | 3  
I.E. 72, 68, 60  | 2 | 2 | 2  
Bot. 1, Physio. 4  | 5 | 5 | 5  
Forestry 26  | 3 | 3 | 3  
M.S., A.S., or P.E.  | 1 | 1 | 1  

16 18 16  

*Electives must be approved by Department Head.
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**TWO-YEAR VOCATIONAL TECHNICAL PROGRAM**

Certificate of Completion in Carpentry will be granted, upon application and payment of diploma fee, to students completing the Freshman and Sophomore years of the curriculum. Some substitutions of specific courses will be allowed with the approval of the Department Head and Dean.

**Courses**

6. **Applied Shop Mathematics.** Simple mathematical formulas are used in solving problems in mechanical work. These include speed ratios, steel square, micrometer reading, and area and volume problems. Prerequisite: High school algebra and geometry. Three lectures. (3F or W) Swenson

13. **Driver Training.** For persons who desire to learn to drive an automobile correctly and safely. Traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; general mechanics, operation, and servicing of automobile; highway safety engineering; and actual supervised training in dual-control cars. Two lectures, lab arranged. (2F, S) Willey

30. **Building Maintenance.** Discussion of materials used in maintaining modern school buildings and their proper use. Required of all persons doing part-time custodial work on campus. Two lectures, lab arranged. (3F, W, S) Wadsworth

40. **Sheet Metal.** Fundamental operations and tool processes of sheet metal-work. Articles are made from black iron, galvanized iron, and bright tin that give practice in pattern developing, cutting, soldering, seam ing, riveting, and wiring. Two 3-hour labs. (2F) Hailes

60. **Elements of Plumbing.** Includes specifications, codes, layouts, installations, inspections, cutting and fitting pipe, and repairs. One lecture, one lab. (2S) Merkley

61. **Fundamentals of Woodwork.** Study and practice in the use and care of hand tools including the sharpening of tools, and a study of the fundamental hand tool processes. An introduction to the use of common woodworking machines is included. Practice in wood construction is provided through the building of projects. Three labs. (3F) Swenson

62. **Machine Woodwork.** A study of safety measures, use and care of all of the common woodworking machines including the sharpening of machine cutters and other machine maintenance problems. A study of woods and various other materials related to wood construction is included. Practical experience is provided through student-constructed projects. Prerequisite: I.E. 61. Three labs. (3W) Swenson

63. **Advanced Woodwork.** The design and construction of furniture and other advanced projects provides additional experience and practice in both hand tool and machine processes for students who have completed I.E. 62 or who have had considerable woodworking experience. Problems related to furniture and other fine wood construction are made a part of the course through assigned reading, lecture and class discussion. Prerequisite: I.E. 62. Three labs. (3S) Swenson
64, 65, 66. Building Construction. Laying out and constructing buildings, stressing carpenter work. Includes concrete forming, framing, roof framing, roofing, scaffolding, siding, exterior and interior trim, window and door work. Special attention is given to trade construction methods. Prerequisite: I.E. 63. Three labs. (3F, 3W, 3S) Merkley

68. Practical Electric Wiring. For students in building construction courses. Covers the national electrical code and local codes in Utah communities. Includes choice of materials, design of circuits and inspection for electrical heat, light and power installation in homes and small public buildings. Two lectures, one lab. (3W) Swenson

70. Wood Finishing. Fine wood finishing such as natural finished, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, and stucco paints. Students are required to practice in each type of finishing. Two lectures, three 1-hour labs. (3F, W, or S) Staff

72. Concrete and Masonry Products. Composition of concrete for various purposes. Masonry composition and construction; their strength and thermal conductivity. Projects are built in the laboratory during the course. One lecture, one lab. (3F) Merkley

73. Materials of Industry. Wood and wood products, commercial veneered panels, roof coverings, wall boards, insulating materials, siding, composition panelings, glass products and other non-metal materials used in building trades. Three lectures. (3W) Staff

74. Woodwork for Everyone. This class is open to all who have a desire to work with wood, both men and women. Instruction is given in the fundamentals of woodwork and includes training in the use of both hand tools and woodworking machines. Projects are selected and built by students; a wide latitude in the selection of projects is afforded. Special emphasis is given to wood turning. Instruction is also given in furniture repair and in the basic principles of woodfinishing and re-finishing. Five labs. (2-5F, W or S) Staff

101. Observations in Student Teaching. This course serves as a preliminary to the regular student teaching in Industrial Education. Students will be assigned to various schools within the area to observe teaching in Industrial Arts or Trade and Industrial Education. (1F, W, S) Mortimer; Hailes

102. Instructional Aids. Instruction in the purpose, types, sources, preparation and proper use of audio and visual aids, including samples, models, charts, graphs, slides, still film, movie film, sound film, and other aids suitable for classroom and auditorium use. Prerequisites: I.E. 107 and 129. Three lectures. (3W) Mortimer

104. Occupational Analysis. Principles and practice in analyzing occupations in order to determine teaching content. Students complete an analysis of one unit for a trade or occupation. Three lectures. (3 Arr.) Mortimer

107. Principles and Objectives of Industrial Education. Philosophy and purposes of Industrial Education. Students study and compare general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three lectures. (3F) Mortimer

110. Shop Organization and Management. Teaches students to organize and manage an Industrial Education Shop of the unit, general, or multiple activity type. Each student prepares, for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. Prerequisites: I.E., 107, 129. Three lectures. (3W) Mortimer

111. The General Shop. Comprehensive study of the types of "General Shop," its advantages and applications; content and organization of subject matter; methods of teaching and shop plans. General shop projects, shop plans and new trends in content and equipment are given special consideration. Prerequisite: I.E. 107. Three lectures. (3 Arr.) Mortimer; Hailes
112. **Student Teaching in Industrial Education.** Students observe and teach in Industrial Arts shops throughout the state. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the state in junior and senior high schools. (8W) Mortimer; Hailes

113. **Driver Education and Traffic Safety.** To acquaint prospective teachers and others with available instructional materials for driver education and the latest methods of presenting these materials in the classroom and on the road. Supervised practice is arranged for each student. (3F, or S) Willey

118. **Industrial Safety Education.** A practical course for technical workers, supervisors, and foremen in fundamentals of plant planning and operation for accident prevention. Special consideration is given to planning safety programs to meet the needs of particular situations as they are experienced by the members of the class. Three lectures. (3W) Staff

120. **Personnel Relations.** Training for leadership in industry as foremen, supervisors, and directors. Problems in organizing, supervising, training, and directing personnel. Directed conferences based on student experiences and directed studies in leadership problems and principles are included. Three lectures. (3F or S) Staff

121. **Methods in Industrial Education.** Latest techniques of teaching applied to individual and group instruction in Industrial Education. Each student has opportunity to use these different methods in presenting lessons before the class. Prerequisite: I.E. 107, 129. Three lectures. (3W) Mortimer

123. **Curriculum Problems in Industrial Arts.** Teaches prospective Industrial Arts instructors the application of skills and knowledge acquired in basic shop courses. Each student constructs projects suited to the work recommended by the State Department of Education. He prepares lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisite: I.E. 129 and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. Three lectures, three 3-hour labs. (6S) Mortimer

124. **History of Industrial Education.** Historical developments of manual and industrial education from the early leaders to the present. Emphasis is given to the influence that various leaders and movements, in both Europe and America, have had upon present-day objectives of industrial arts and vocational industrial education. Three lectures. (3F) Mortimer

129. **Organization and Development of Instruction Materials.** Selection and arrangement of teaching materials to be used in industrial arts and trade and industrial shop work. Three lectures. (3F) Mortimer

141. **Art Metalwork.** Laboratory work in embossing, sinking, engraving, etching, and metal spinning operations. Work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Tool Technology. Three 3-hour labs. (3S) Hailes

142. **Plastics.** Acquaints students with the new and important group of plastic materials now produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. Special emphasis is given to the place of plastics in modern industrial arts programs. Three 3-hour labs. (3F) Hailes

143. **Recreational Crafts.** Especially for students majoring in recreational leadership. Consists of: (1) planning and organizing craft work as part of community recreational programs, (2) laboratory work in crafts, such as wood, leather, plastics, metals, and others. Two 3-hour labs. (2S) Hailes

144. **Foundry Principles and Practices.** Principles and practices of basic foundry work. Castings are made using common non-ferrous metals, such as aluminum, copper, brass, and bronze. Two 3-hour labs. (2F) Hailes

145. **Industrial Arts Applied Electricity.** Provides the prospective teacher with an understanding of how the basic principles and applications of electricity in the home and in industry should be prepared for the industrial arts program of secondary schools. Prerequisite: E.E. 21. One lecture, two 3-hour labs. (3F) Mortimer
I.E. 150. Related Technical Training in Vocational Education. A course provided for students enrolling in industry and factory schools conducted on a college level wherein instructors, course content, and facilities have been approved by a committee functioning through the Industrial Education Department. This course may be repeated for a maximum of nine quarter hours credit to be acquired at a rate not to exceed 1½ quarter hour credits per 40 hour clock-hour week. No students should expect to acquire more than three credits in this course in any one calendar year except where teacher training courses are of longer duration. Regular college fees must be paid and accepted registration procedures followed. Time and credit arranged.

161, 162, 163. Advanced Building Construction. Estimating and contracting. Construction and design of homes, farm buildings and apartments. Covers porch work, stairways, dormers, special roofs, insulation and other special construction, specification writing, cost estimating, construction methods, allowable loads, and drawing of special sections and details. Problems in actual bidding on sets of plans are worked out by students. Prerequisites: I.E. 66, E.D. 94. Three lectures, two labs. (5F, 5W, 5S) Staff

164. Conference Leading. Principles and practice in conference leading applied to methods used in industry. Emphasis given to preparation, use and evaluation of this method as it affects industrial education programs. Workshop or lecture. (3 arr.) Staff

167. Special Problems in Industrial Education. For qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Time and credit arranged. Staff

171, 172, 173. Cabinet Work. Design and construction of furniture and cabinets. Special emphasis is given to planning cabinets for modern homes and buildings and to organization of the work for efficient production. A study of woods best suited to furniture and cabinet construction is included. Prerequisite: I.E. 63 (3F, 3W, 3S) Merkley; Swenson

174. Art Woodwork. Study and application of decorative means employed for artistic appeal in wood. Turning, veneering, inlaying, finishing, and other techniques are included. Students also study and use the woods and tools best adapted to the work. Prerequisite: I.E. 63. Two 3-hour labs, one lecture. (3F, S) Mortimer; Merkley

180. Industrial Arts for Elementary Schools. Objectives and theory of Industrial Arts in the elementary school. Suitable instructional content will be presented for each grade level and methods of teaching and organizing instructional materials will be carefully considered. Instruction is given on the use of tools and materials in the shop where projects suitable for the elementary school will be constructed from modern industrial materials. Two lectures, one lab. (3W) Staff

184. Ornamental Iron Work. Designing and making of iron furnishings in harmony with modern design and techniques for both interior and exterior use. Wrought iron furniture, railings, etc., will be planned and constructed. Prerequisite: Basic course in Welding. 2 labs. (2S) Staff

207. Philosophy of Vocational Education and the Practical Arts. Designed to enrich and expand the student's understanding of the nature and purposes of vocational education and practical arts, their relationships and differences, and the place each phase of the work should have in a public school program. Prerequisite: I.E. 107 or equivalent. Three lectures. (3 Arr.) Staff

209. Course of Study Building in Industrial Education. Teaches students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, reference, tests, and instructional schedule. Each student completes this work for one unit of instruction. Prerequisite: I.E. 107. Three lectures. (3 Arr.) Mortimer

251. Administration and Supervision of Industrial Education. The laws, regulations, and policies affecting Industrial Education programs; organization, supervision, and management necessary for successful operation of these programs. Three lectures. (3 Arr.) Staff
254. Measurement in Industrial Education. Construction and use of the various types of tests and rating scales used in Industrial Education. Emphasis is placed upon measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods necessary for intelligent use of the tests are covered. Prerequisite: Psychology 102. Three lectures. (3 Arr.) Mortimer

255. Techniques in Writing Instruction Sheets. Principles underlying development of instruction sheets for use in industrial arts and trade and industrial education programs. Prerequisite: I.E. 129. Three lectures. (3 Arr.) Staff

259. Planning and Equipping School Shops. Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. For administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students study basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to solution of their particular problems. Prerequisite: I.E. 110. Three lectures. (3 Arr.) Staff

260. Problems of Adult Education. Development of Adult Education movements; learning abilities, educational interests, needs of adults, organization of evening school programs, apprenticeship training, and related instructions for trade programs will be included. (3 Arr.) Staff

267. Reading and Conference. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with approval of the department head; investigation is carried on under direction of the major professor. (Arr.) Mortimer

270. Seminar in Industrial Education. Gives opportunity for investigation and reporting of individual problems. (1-2 Arr.) Mortimer

271. Research and Thesis Writing. Provides for individual work in thesis writing in industrial education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arr.) Mortimer

290, 291, 292. Advanced Studies Under Plan “B.” Special library and seminar problems or studies designed to meet requirements for reports under plan “B.” (2-3 Arr.) Mortimer

WELDING

A. B. Kemp, Instructor, and Head of Department; Edward L. France, Assistant Professor.

This department provides instruction in all phases of electric and oxy-acetylene welding with curricula leading to Bachelor of Science degrees in Welding Engineering or Industrial Technology and a two-year curriculum leading to a certificate of completion. It also offers general service courses for students in other departments who desire to become familiar with basic welding as it applies to their field of endeavor.

**Welding Engineering Curriculum**

**Freshman**

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<td>C.E. 105, 106, 107</td>
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**Welding Technology Curriculum**

Degree: Bachelor of Science in Industrial Technology

Major: Welding Technology

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<tr>
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<td>Math. 34, 35, 44</td>
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<td>T.E. 56</td>
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<tr>
<th>Two-Year Vocational Technical Program</th>
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<td>Math. 34, 35', 44'</td>
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<td>Physics 17, 18, 19</td>
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<td>M.S. or A.S.</td>
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</table>

*1Humanities may be selected from the following: History, economics, government, literature, sociology, philosophy, psychology, religion (accepted by the university for college credit), and fine arts.

*2See footnote 1, page 189.
Courses

In all of the following courses, various techniques and welding positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

41, 42, 43. Acetylene Welding. Acetylene welding of ferrous and non-ferrous metals as used by industry. (5F, 5W, 5S) France

44, 45, 46. Electric Welding. Electric welding as used in industry, (5F, 5W, 5S) Kemp

91. Acetylene Welding. Principles and practice in fundamentals of oxy-acetylene welding and cutting. A general service course open to all college students. Two lectures, two 2-hour labs. (3F, 3W, 3S) Kemp


94. Electric Welding. Principles and practices in use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc welding of steels. Two lectures, two 2-hour labs. (3F, 3W, 3S) Kemp

96. Engineers' Welding. Exploration in Modern Welding. Students receive basic instruction and practice in use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. (3S) Kemp

153, 154, 155. Advanced Acetylene Welding. Hard surfacing, special bronzing problems, pipe welding, and other problems. Qualifies for code, tests. Prerequisite: Weld. 43 or 92. (3F, 3W, 3S) France

161, 162, 163. Advanced Electric Welding. Special problems in arc-welding and qualifies students for code test. Prerequisite: Weld. 46. (3F, 3W, 3S) Kemp

190. Advanced Acetylene Welding. Vertical and overhead steel welding. Special problems. Prerequisite: Weld. 91. (3F, 3W, 3S) France


193. Welding Seminar. Current Topics in production methods, cost, design, and manufacture of welded products used in modern industry. (2S) Kemp
Increasing activity in the fields of forest management, range management, wildlife management, soil conservation, watershed management, and forest recreation, and the unquestioned need for their correlation in long-range wild land management, have created excellent opportunities for men who wish to enter these fields of public service. The purpose of this college is to provide training in the conservation and management of wild lands and their resources so that they may be of continuing benefit for present and future generations of citizens.

The favorable geographical location of this College of Forest, Range, and Wildlife Management provides exceptional facilities for field experience and affords excellent opportunities for effective training in managing wild lands and their resources. Forest and range lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of the school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range, soil conservation, and wildlife problems and offer unlimited study projects and opportunities for demonstration. Herds of elk and deer are studied close to the campus during the winter. Primitive areas, Yellowstone Park, and other national parks are within a half day to one day's driving distance.

A regional office of the U. S. Forest Service is in Ogden, 45 miles distant, and offices of the U. S. Fish and Wildlife Service and the Utah Department of Fish and Game, the U. S. Bureau of Land Management, U. S. Bureau of Reclamation, U. S. Indian Service, and U. S. Soil Conservation Service are in Salt Lake, 85 miles from Logan.

Courses of Study

The curricula of this college prepare men for positions with federal or state agencies and for private work in (1) forest management, (2) range management, and (3) wildlife management. Forest management students may choose between three options: one designed to train for general forestry work, as with the public land managing agencies, one more strictly for timber management, and one in forest recreation management. Range management students may specialize in general range management, forest-range management, or soil conservation and watershed management. Wildlife management students may select a curriculum to train either for game management or fishery management.

Entrance Requirements

Normally, graduation from an accredited high school is prerequisite to entrance to the college. Veterans and certain others, not high school graduates, may be admitted if they make acceptable scores on certain college entrance tests.

Students entering the college will make more satisfactory progress if they have had two years of high school algebra, geometry, and also chemistry, physics, typing, and biology. Four years of English are also desirable. It is important that the student should have an interest in and an aptitude for studying natural science.

Summer Camp

Successful completion of field instruction at the college-operated summer camp is required of students taking certain curricula, prior to the junior year. This includes all students who plan to major in any curricula in the Forest Management Department and the Forest-Range Management option offered by the Range Management Department. Any properly qualified student in
the college may attend if he desires and makes suitable arrangements prior to the camp period. The camp opens soon (usually the first Monday) after the end of the spring quarter, and continues for seven weeks, unless the camp is released for fire-fighting in which instance the camp lasts eight weeks. Nine credits are allowed for the complete program. In addition to the regular summer school fees, a $5.00 fee is charged for each of the four courses. Board is provided on a cost basis, lodging is without cost. Students attending camp must be inoculated against Rocky Mountain spotted fever.

Students who transfer to this college from other schools should note that (a) completion of the camp program is required in the above-named courses of study; (b) it is prerequisite to professional forest management course work in the junior year; and (c) in addition to having completed two years of college work, the pattern of courses taken at another college should essentially duplicate those required of freshmen and sophomores in this college.

Field Trips

Field trips are planned each year as part of the regular class instruction. Besides short trips scheduled for individual courses, each department conducts an extensive field-problems trip in the spring quarter of the junior year, or the fall quarter of the senior year; this trip is required of all students. The trip for range management juniors is taken just before the fall quarter starts. The trip for forest management and wildlife management juniors is taken during a period of ten days or two weeks just prior to the end of the spring quarter. A fee of about $40.00 is charged each student to defray the general expenses of the trip.

Loan Funds

Two sources of funds are available on a loan basis to worthy, deserving upper-division studies in the College of Forest, Range, and Wildlife Management. These are the W. B. Rice Memorial Loan Fund and the Bureau of Land Management Fund. Loans are made for short periods. The funds are administered by a faculty committee and application should be made to the Dean's office.

Graduation Requirements

The following general requirements are met by all students graduating from the College of Forest, Range, and Wildlife Management.

A. One hundred and ninety-two quarter credits, exclusive of basic Military Science, physical education, and summer camp (as previously designated).
B. All courses prescribed under the study program of his chosen field.
C. Three hours of social science, in addition to general economics.
D. Proficiency in written and spoken English. Students showing deficiency are required to pass certain supplementary or corrective courses in addition to regular requirements.
E. At least one summer of department-approved practical and qualifying work experience. In certain instances summer camp attendance may fulfill this requirement.

RANGE MANAGEMENT

L. A. Stoddart, Professor and Head of Department; C. Wayne Cook, Professor; Arthur D. Smith, Associate Professor; DuWayne L. Goodwin, Phil R. Ogden, Max E. Robinson, Assistant Professors, Extension Range Specialist.

A four-year program leading to the degree of Bachelor of Science in range management is available in the College of Forest, Range, and Wildlife Management. Opportunity is given under this program to specialize in general
range management, forest-range management, or in range soil conservation and watershed management.

Graduates are qualified for positions such as Forest Ranger, Soil Conservationist, and Range Manager, or Range Conservationist under the United States Civil Service Commission, with such federal agencies as the Forest Service, Soil Conservation Service, Indian Service, and Bureau of Land Management. At present an acute shortage exists in qualified men for such positions, and employment opportunities are excellent. State land management and both federal and state research opportunities are also unusually good.

The graduates from these programs are qualified for many private jobs, such as operating a livestock ranch, technical foreman for livestock companies, adviser to land management companies, and range land appraiser.

The degree of Master of Science in Range Management is granted upon completion of an arranged course of study. Adequate facilities are available to allow emphasis upon such related fields as forestry, soil conservation, animal husbandry, botany, wildlife, economics, or soils. A bachelor's degree in range management or a related subject is prerequisite to advanced study.

To a selected few students, a program of instruction and research leading to the degree of Doctor of Philosophy also is offered. Students having the bachelor's or master's degree should contact the department head for information concerning their eligibility for study toward this degree.

There are available to graduate students a number of assistantships which will defray most of the costs of attending school. Such assistantships involve part-time work for the department as research assistants. They generally pay $125 per month or more and include exemption from non-resident tuition fees. Several of these assistantships are available each year, and interested students should apply to the department head for further details.

**Required Basic Courses**

All students in the Department of Range Management must complete a core of basic course work as detailed below. In consultation with his adviser, the student must elect other course work to meet his personal objective in training. The student must obtain from his adviser approval of a complete study program before becoming a candidate for a degree. It is recommended that this be done as early as possible and, in no instance, later than the Junior year.

During the freshman and sophomore years all range management majors must complete the following:

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<th>Course</th>
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<tr>
<td>College algebra and trigonometry</td>
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<td>Chemistry, including organic</td>
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<tr>
<td>Botany, including taxonomy</td>
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<td>Physics</td>
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<td>Economics</td>
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<td>Geology</td>
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During the junior and senior years all range majors must complete the following:

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<td>Plant ecology</td>
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<tr>
<td>Plant physiology</td>
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<tr>
<td>Range plant communities</td>
<td>8</td>
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<tr>
<td>Agrostology</td>
<td>4</td>
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<tr>
<td>Watershed management</td>
<td>4</td>
</tr>
<tr>
<td>General range management</td>
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<td>Range field problems</td>
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<td>Range technical problems</td>
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<tr>
<td>Range improvement</td>
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The following fields of specialization are recognized in the department:

1. **General Range Management.** Elective course work should emphasize range management and animal husbandry. The student is fitted for management of range lands, public range land administration, and private range operation.

2. **Forest-Range Management.** Elective course work in forest management should be emphasized, including summer camp. The student is especially fitted for administrative work with the U. S. Forest Service.

3. **Watershed Management.** Elective work should emphasize mathematics, soils, and hydrology. At least 3 courses in animal husbandry are required for Civil Service Examinations in Soil Conservation. These students are fitted for work in the fields of vegetation influences, soil conservation, and watershed supervision.

Among recommended electives are all courses in range management; Forest management 103, 104, 106, 118, 130, 132, and forestry summer camp; Wildlife 150, 153, 155; Mathematics 97, 98; Civil Engineering 81, 141, 173; Agricultural Engineering 108; Agronomy 103, 114, 155, 165; Geology 115; Applied Statistics 131, 132; Botany 121; Animal Husbandry 2, 10, 110, 125, 150; Veterinary Science 120; and Zoology 2, 112.

**Minor in Range Management**

The following courses in Range Management are suggested for students who wish to minor in this field (requirements subject to approval by the Range Department): Range 126, Plant Ecology, 5 credits; Range 160, Principles of Managing Range Lands, 5 credits; Range 130, 131, 132, Range Plant Communities, 10 credits; Range 181, Range Economics, 3 credits.

**Description of Courses**

1. **Elements of Range Management.** Introduction to the problems and methods in the field of range management. (1W) Stoddart

98. **Plant Community Analysis.** Field practice with native vegetation. (Summer Camp 1) Goodwin

126. **Plant Ecology.** Analysis of habitat factors that influence plant growth and distribution; attention to plant succession and competition and to plant indicators. Prerequisites, Botany 30, Agronomy 56 or 58. Lab fee $1. (5F, S) Stoddart

130. **Range Plant Communities—Grasslands.** Composition, distribution, successional patterns, and management of grassland ranges. Prerequisite, Botany 30. Lab fee $1. Two lectures, one lab. Saturday field trips may be scheduled. (3F) Goodwin

131. **Range Plant Communities—Forests.** Composition, distribution, successional patterns, and management of forested ranges. Prerequisite, Botany 30. Two lectures, two labs. Saturday field trips may be scheduled. Lectures may be taken without labs. (2-4W) Goodwin

132. **Range Plant Communities—Deserts.** Composition, distribution, successional patterns, and management of desert ranges. Prerequisite, Botany 30. Lab fee $4. Two lectures, one lab. Saturday field trips may be scheduled. (3S) Goodwin

160. **Principles of Managing Range Lands.** A general course designed to give students not majoring in the field a knowledge of how to evaluate, increase, and perpetuate range. Field trips and laboratory work on range plants. Credit not allowed students having credit in Range 162. Prerequisite, Botany 25. Four lectures, one lab. Lab. fee $2. (5S) Cook

162. **Range Management.** Problems in managing native range lands; maintenance of production; utilization of range forage; and range livestock
management. Prerequisite, Botany 30. Four lectures, one lab. Lab fee $3. (5F) Cook

163. Range Improvement. Methods and problems involved in seeding range lands, improving stock watering facilities, and fencing ranges, terracing, water spreading and use of dams on range lands. Prerequisite, Range 160 or 162. Two lectures. (2W) Stoddart

164. Technical Problems in Range Management. Specialized problems in range management and range administration encountered by the technician. Prerequisite, Range 160 or 162. (3W) Stoddart

180. Watershed Management. Floods, soil erosion, and runoff on range and forest lands, effects of vegetation in equalizing runoff and preventing erosion, and methods of rehabilitating damaged watersheds. Prerequisite, Range 126. Three lectures, one lab. Lab fee $2. (4F) Goodwin

181. Range Economics. Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite, Range 160 or 162. (3W) Cook

192, 193, 194. Range Seminar. A systematic review of range management and related subjects. Prerequisite, Range 160 or 162. (2F, W, S) Staff

195. Range Problems. Individual study and research upon a selected range problem. (1-3F, W, S) Staff

196, 197. Range Field Problems. Field study of range management operation and research. Courses 196 and 197 are given alternate years. Lab fee $30. (3F) Goodwin

200. Range Thesis. Original research and study on a problem in range management. Open only to graduate students. (1-15F, W, S) Staff

204. Land Use Seminar. Current problems and practices in wildland management with special emphasis on western range. (2F) Stoddart

205. Seminar in Range Nutrition. Problems in management and research in the field of plant and animal nutrition on the western range. Offered 1958 and alternate years. Prerequisite, Animal Husbandry 10. (3W) Goodwin


210. Environmental Factors. Environmental factors and interaction between organisms and environment as found on native range land. Offered 1959 and alternate years. Prerequisite, Range 126. (3W) Goodwin

211. Synecology. Development, structure analysis, and classification of native range vegetation. Offered 1958 and alternate years. Prerequisite, Range 126. (3W) Goodwin


281. Advanced Range Economics. Advanced study of economics of various systems of range management, range seeding, land operation, and livestock management. Prerequisite, Range 181. (2S) Smith

WILDLIFE MANAGEMENT

W. F. Sigler, Professor and Head of Department; G. H. Kelker, Professor; A. W. Stokes, Associate Professor; and C. A. L. Professor; Robert Smith, Teaching Assistant. Collaborators: J. B. Low, Professor and Biologist; O. B. Cope, Professor and Fishery Biologist; Norman Benson, and Ross V. Bulkley, Assistant Professors and Fishery Biologists. U. S. Fish and Wildlife Service.
Upon completion of basic courses and the upper-division requirements outlined in the study program, students receive the degree of Bachelor of Science in Wildlife Management.

Course work in the junior year provides basic training in both options offered by the department. The work of the senior year should complete the option of game management or fisheries started in the junior year. In these two years, the student will need to complete a minimum of thirty hours from courses offered by the department.

The option in game management stresses ecological and economic phases of important birds and animals. The student, if he wishes, may choose two courses from three management courses offered—Game Birds (Wildlife 146), Waterfowl (Wildlife 147) and Big Game (Wildlife 153). Those students concentrating in big game management must attend summer camp, then take at least twelve hours in Range Management and seven more hours in Forest Management. However, thirty hours are required in forestry for those desiring employment in the U. S. Forest Service. Also, students concentrating on small game will need to select supporting courses with care. Such approved support to a major study will constitute a minor when eighteen hours are selected either from one department or from two closely related departments.

The fishery option trains students primarily for management of freshwater fish. The general principles, however, apply to marine and anadromous (salmon) fish as well. Graduates find work in marine as well as freshwater fishery fields. Since fishing is the chief recreational activity of people in the United States, this resource is being exploited faster than its problems can be solved. This option includes many leads to other fields of study.

Wildlife students receive ample opportunity during the school year to learn field techniques they will use after graduation. These include census methods of fish and game, hunter checking station and creel census assignments, determination of sex, age, and growth rates of fish and game, and evaluation of habitat.

The advance degrees, Master of Science or Doctor of Philosophy in Wildlife Management or in Fishery Management, are granted upon completion of a prescribed course and fulfillment of the Graduate School requirements.

The Utah Cooperative Wildlife Research Unit provides eight research assistantships for graduate students in the department. The Wildlife Management Department has one teaching assistantship. In addition there are usually several grants from outside conservation agencies available to support graduate research. Prospective students should submit formal application with a transcript of college credits and references to the Dean of the School of Graduate Studies, but inquiry on admission should be directed to the head of the Wildlife Department. Applications for assistantships should be directed to the Director of the Wildlife Research Unit or the head of the Department.

### Required Basic Courses

<table>
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<th>Department, Course No.</th>
<th>Course Name</th>
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<td>Military Science 11, 12, 13</td>
<td>Basic Military Science</td>
<td>F 1 W 1 S 1</td>
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<tr>
<td>or Air Science 11, 12, 13</td>
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<tr>
<td>English 1, 2, 3</td>
<td>Basic Communications</td>
<td>3 3 3 3 3</td>
</tr>
<tr>
<td>Mathematics 34, 35, 44</td>
<td>Algebra, Trigonometry</td>
<td>5 5 3 3 3</td>
</tr>
<tr>
<td>Economics 51</td>
<td>General Economics</td>
<td>5 5 5 5 5</td>
</tr>
<tr>
<td>Botany 24, 25, 30</td>
<td>General Taxonomy</td>
<td>5 5 5 5 5</td>
</tr>
<tr>
<td>Forest Management 1</td>
<td>Survey-Orientation</td>
<td>5 5 5 5 5</td>
</tr>
<tr>
<td>Range Management 1</td>
<td>Elements of Range Mgt.</td>
<td>5 5 5 5 5</td>
</tr>
<tr>
<td>Wildlife Management 1</td>
<td>Elements of Wildlife Mgt.</td>
<td>5 5 5 5 5</td>
</tr>
</tbody>
</table>

1Not required by those who have served with the Armed Forces.

2Students presenting 1½ units of high school algebra or otherwise qualified to take College Algebra (Math. 35) are not required to take Math 34. High school geometry is prerequisite to Math. 34, 35, and 44.
## Sophomore Year

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Science 21, 22, 23</td>
<td>Basic Military Science</td>
<td>F 1 1 1</td>
</tr>
<tr>
<td>or Air Science 21, 22, 23</td>
<td>or Basic Air Science</td>
<td></td>
</tr>
<tr>
<td>Zoology 3, 4</td>
<td>Invertebrate and Vertebrate</td>
<td></td>
</tr>
<tr>
<td>Chemistry 10, 11, 12</td>
<td>General, Organic</td>
<td>F 5 5</td>
</tr>
<tr>
<td>Entomology 13</td>
<td>General Entomology</td>
<td></td>
</tr>
<tr>
<td>Physiology 4</td>
<td>General Physiology</td>
<td></td>
</tr>
<tr>
<td>Physics 6</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>Agronomy 58</td>
<td>Forest and Range Soils</td>
<td></td>
</tr>
</tbody>
</table>

## Summer Camp

## Junior Year

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Management 145</td>
<td>Principles of Wildlife Mgt.</td>
<td>F 3</td>
</tr>
<tr>
<td>Wildlife Management 160</td>
<td>Animal Ecology</td>
<td></td>
</tr>
<tr>
<td>Wildlife Management 171</td>
<td>Field Problems</td>
<td>F 2</td>
</tr>
<tr>
<td>Wildlife Management 172</td>
<td>Problem Orientation</td>
<td></td>
</tr>
<tr>
<td>Wildlife Management 175</td>
<td>Wildlife Law Enforcement</td>
<td>F 3</td>
</tr>
<tr>
<td>Range Management 126</td>
<td>Plant Ecology</td>
<td></td>
</tr>
<tr>
<td>Speech 105</td>
<td>Intermediate Speech</td>
<td>F 3</td>
</tr>
</tbody>
</table>

## Senior Year

All senior wildlife management students take the following courses:

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Mgt. 157, 158, 159</td>
<td>Wildlife Seminar</td>
<td>F 1 1 1</td>
</tr>
<tr>
<td>Agronomy 131</td>
<td>Applied Statistics</td>
<td></td>
</tr>
<tr>
<td>English 111 or 112</td>
<td>Technical writings or Advanced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>writing problems</td>
<td>F 3</td>
</tr>
</tbody>
</table>

To the above list of 19 hours specified in the Wildlife curriculum, the student will need to add at least 11 more hours for a major in game management or in fisheries.

## Major in Game Management

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Management 146</td>
<td>Upland Game</td>
<td>F 3</td>
</tr>
<tr>
<td>Wildlife Management 147</td>
<td>Waterfowl and Furbearers</td>
<td></td>
</tr>
<tr>
<td>Wildlife Management 153</td>
<td>Big Game</td>
<td>F 5</td>
</tr>
</tbody>
</table>
| Wildlife Management 170 | Wildlife Problems                  |                           | *(3 hrs. any quarter)*

Electives from associated departments (Botany, Range, Forestry, Zoology, and others) are chosen by the student with approval of his major professor and the Dean to support the major; and if possible, such cognate work from one or two closely related departments may be elected to provide a minor of 18 hours. However, a student must take 30 hours of forestry if he desires employment with the U.S. Forest Service.

*Not required of those who have served with the Armed Forces.*
Major in Fish Management

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
<th>F</th>
<th>W</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Management 161</td>
<td>Limnology</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife Management 165</td>
<td>Fish Management</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Wildlife Management 169</td>
<td>Techniques of Fishery Mgt.</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoology 155</td>
<td>Ichthyology</td>
<td></td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description of Courses

1. **Elements of Wildlife Management.** Introduction to the problems and methods of wildlife management. (IS) Staff

99. **Wildlife Practice.** Integrated studies of wildlife populations in relation to land uses. Lab fee $5. (Summer camp 1) Kelker

145. **Principles of Wildlife Management.** Characteristics of animals and their habitat in relation to general management practices. 3 lectures. Stokes

146. **Management of Upland Game.** Taxonomy, life histories, distribution, environmental needs, and plans for management of game birds and small mammals. 2 lectures, 1 lab. Prerequisite, Wildlife 145. (3S) Stokes

147. **Waterfowl and Furbearers Management.** Taxonomy, life histories, habitat requirements, economic importance, and plans for management of waterfowl and furbearers, especially muskrat and beaver. Prerequisite, Wildlife 145. 3 lectures, field trips. (5S) Stokes

150. **General Wildlife Management.** Principles of animal ecology and wildlife management; life histories, economics, and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife management majors. Field trips arranged. 5 lectures. (5S) Kelker

153. **Big Game Management.** Life histories, distribution, numerical variation, enemies, and management activities for big game animals. Prerequisite, Wildlife 145 or 150. 3 lectures, 2 labs, including field trips. (5W) Kelker

155. **Economic Wildlife.** General importance of wildlife resources; natural history, economic values and control methods for rodents and predators; identification of skulls and skins; brief evaluation of hawks and reptiles. 2 lectures, 1 lab. (3W) Kelker

Ichthyology. Ecology, classification, and life histories of native and introduced fishes. 2 lectures, 2 labs. (4W) (See Zoology 155) Sigler

157, 158, 159. **Wildlife Seminar.** Discussion of current developments in wildlife management. 2 recitation periods per week. (1F, W, S) Staff

160. **Animal Ecology.** Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. 3 lectures, 2 labs, including field problems. (5F) Smith

161. **Limnology.** Physical, chemical and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisites, Botany 30, Zoology 13. 2 lectures, 2 labs. (4F) Sigler

162. **Fishery Ecology.** Importance of the animal environment of freshwater fishes. Food organisms, predation, parasitism, and economic importance. Prerequisites, Zoology 3, 4, 13. 2 lectures, 2 labs, including field trips. (4W) Cope

165. **Fishery Management.** Principles and techniques in lake, pond and stream improvements; ecology of game fishes, propagation methods, common fish diseases. Prerequisite, Zoology 155. 2 lectures, 1 lab. (3S) Sigler

169. **Techniques in Fishery Management.** Mechanics of collecting and analyzing life history material of fishes. Prerequisites, Zoology 155, Wildlife 161. 3 lectures, 2 labs. (5W) Sigler

170. **Wildlife Problems.** Individual study and research upon a selected wildlife problem approved by the instructor. (1-5F, W, S) Staff
171. Field Problems. Study of wildlife management operations of various agencies in the West. (Fee $35.) (2F, S) Staff

172. Problem Orientation. A discussion of the needs of and approach to wildlife investigations presenting data, analyzing the problem, and drawing conclusions relative to research in wildlife management. 3 lectures. (3W) Kelker

175. Wildlife Law Enforcement. Review of state and federal regulations of fish and game; discussions of apprehension of violators, collection of evidence and its use in court. Offered in even-numbered years. (3W)

210. Advanced Field Problems. Field training in techniques not covered in undergraduate courses. (1-5F, W, S) Staff

253. Advanced Big Game Management. Population dynamics, census methods, hunting regulations, and management plans. Prerequisite, Wildlife 153 or equivalent. 2 lectures, 1 lab. (3W) Kelker

257. The Research Approach. The application of elementary logic and the scientific method to wildlife investigations. 2 lectures. (2F) Kelker

258. Graduate Seminar. Discussion of current investigations by class members and by representatives of state and federal agencies. 2 lectures. (2S)

259. Graduate Seminar. Review of current literature. Discussion of the completion and publication of students' technical papers. 2 lectures. (2S) Sigler


261. Advanced Limnology. Advanced study of factors affecting productivity of fresh water. Prerequisite, Wildlife 161 or equivalent. 2 lectures, 2 labs. (4F) Sigler

270. Research and Thesis. Credit for field or laboratory research, library work, and thesis writing. (3-15F, W, S, SS) Staff

FOREST MANAGEMENT

J. Whitney Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; R. R. Moore, Stewart Ross Tocher, Associate Professor; Stewart Ross Tocher; Assistant Professor; Lewis M. Turner, Extension Forester; James L. Mielke, Collaborator in Forest Pathology.

Upon completion of either of the following described courses of study, students are granted the degree of Bachelor of Science in Forest Management. The three courses of study are designed to give the student comprehensive training in all branches of forest management, including growing, protecting, harvesting, and utilization of timber crops. Three options are offered by this department. It is desirable that the student know by the end of the sophomore year in which one he will enroll.

The option in general forestry basically provides training in timber management. However, in recognition of the needs of several of the land and resource managing agencies, it also provides training in range management, watershed management, game management, and recreation management. In brief, this course of study conforms to the concept of multiple-use forestry. This pattern of training meets the needs of personnel engaged in the administration of public forest lands.

The second option, timber management, provides major emphasis on the growing, harvesting, and utilization of timber crops and is appropriate training for employment in private forest industries or specialized timber work with the public forest managing agencies.

The third option in forest recreation management is designed to train men for employment with the National Park Service, the U.S. Forest Service, state departments of conservation, forestry or park services, or municipal park services. Suitable training in outdoor recreation organization, manage-
ment, and supervision is provided, and in addition to this is given sufficient forestry training to qualify graduates for various federal civil service examinations and positions.

The degree of Master of Science in Forest Management may be earned by a student who has an undergraduate degree in forestry, with acceptable scholarship, upon completion of a prescribed course of study and fulfillment of other requirements listed by the College of Graduate Study. Normally the student is required to take all of the courses in the 200 series taught in the Forest Management Department (see description of courses). One or two years may be required, depending upon whether the student is able to devote full or only part time to his studies. Applicants should submit an official transcript of their college courses and an official application for admission to the Dean of the College of Graduate Study. Application forms may be procured from his office.

The Master of Forestry degree program is available to those students possessing a non-forestry Bachelor’s degree, with acceptable scholarship. The requirements include completion of the required, basic lower division courses, the summer camp program, the required upper division forest management curriculum, and ten units of graduate (200 series) course work. This program may require two or more years, depending upon how closely related to forestry is the student’s undergraduate work. Applicants for this program should apply as described in the previous paragraph.

One research assistantship is available to a graduate student in forest management. Application for this fellowship should be made to the head of the Forest Management Department.

Required Basic Courses

—Freshman Year—

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Science 11, 12, 13</td>
<td>Basic Military Science or Basic</td>
<td>F 1 1 1</td>
</tr>
<tr>
<td>or Air Science 11, 12, 13</td>
<td>Air Science</td>
<td></td>
</tr>
<tr>
<td>English 1, 2, 3</td>
<td>Basic Communications</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Mathematics 34, 35, 44</td>
<td>Algebra, Trigonometry</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Chemistry 10, 11, 12</td>
<td>General, Organic Chemistry</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Forest Management 1</td>
<td>Survey-Orientation</td>
<td>2 2 2</td>
</tr>
<tr>
<td>Range Management 1</td>
<td>Elements of Range Mgt.</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Wildlife Management 1</td>
<td>Elements of Wildlife Mgt.</td>
<td>1 1 1</td>
</tr>
<tr>
<td>Animal Husbandry 1, 2</td>
<td>Fundamentals, Laboratory</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Engineering Drawing 60</td>
<td>Engineering Drawing</td>
<td>1 1 1</td>
</tr>
</tbody>
</table>

—Sophomore Year—

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military Science 21, 22, 23</td>
<td>Basic Military Science or Basic</td>
<td>F 1 1 1</td>
</tr>
<tr>
<td>or Air Science 21, 22, 23</td>
<td>Air Science</td>
<td></td>
</tr>
<tr>
<td>Botany 24, 25, 26</td>
<td>General Taxonomy</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Botany 120</td>
<td>Plant Physiology</td>
<td></td>
</tr>
<tr>
<td>Civil Engineering 81, 80</td>
<td>Plane Surveying, Office Practice</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Physics 6</td>
<td>General Physics</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Agronomy 58</td>
<td>Forest &amp; Range Soils</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Economics 51</td>
<td>General Economics</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Speech 105</td>
<td>Intermediate Speech</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Geology 3</td>
<td>Physical Geology</td>
<td>5 5 5</td>
</tr>
</tbody>
</table>

1 Not required of those who have served with the Armed Forces.
2 Students presenting 1/2 units of high school algebra or otherwise qualified to take college algebra (Math. 35) are not required to take Math. 34. High school geometry is prerequisite to Math. 34, 35, 44.
3 Not required of students taking the timber management option.
4 Not required of students who have had adequate training in engineering-mechanical drawing in high school.
### Summer Camp

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Management 96</td>
<td>Forest Practice</td>
<td>3</td>
</tr>
<tr>
<td>Forest Management 97</td>
<td>Forest Surveying</td>
<td>4</td>
</tr>
<tr>
<td>Range Management 98</td>
<td>Plant Community Analysis</td>
<td>1</td>
</tr>
<tr>
<td>Wildlife Management 99</td>
<td>Wildlife Practice</td>
<td>1</td>
</tr>
</tbody>
</table>

### A—General Forestry

#### —Junior Year—

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Management 106,</td>
<td>Forest Management</td>
<td>F: 4, W: 3, S:</td>
</tr>
<tr>
<td>107</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Management 112,</td>
<td>Forest Measurements</td>
<td>F: 4, W: 3, S: 2</td>
</tr>
<tr>
<td>113</td>
<td>Dendrology: Hardwoods, Conifers</td>
<td></td>
</tr>
<tr>
<td>Forest Management 114,</td>
<td>Silviculture</td>
<td>F: 3, W: 3, S: 2</td>
</tr>
<tr>
<td>115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Management 118,</td>
<td>Forest Protection—Fire, Insect,</td>
<td>F: 3, W: 3, S: 2</td>
</tr>
<tr>
<td>119</td>
<td>Diseases</td>
<td></td>
</tr>
<tr>
<td>Forest Management 132</td>
<td>Public Land Administration</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 146</td>
<td>Junior Field Problems</td>
<td>F: 3</td>
</tr>
<tr>
<td>Range Management 126</td>
<td>Plant Ecology</td>
<td>F: 5</td>
</tr>
<tr>
<td>Range Management 162</td>
<td>General Range Management</td>
<td>F: 5</td>
</tr>
<tr>
<td>Wildlife Management 150</td>
<td>General Wildlife Management</td>
<td>F: 5</td>
</tr>
</tbody>
</table>

#### —Senior Year—

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Management 121</td>
<td>Forest Management</td>
<td>F: 4</td>
</tr>
<tr>
<td>Forest Management 122</td>
<td>Forest Valuation</td>
<td>F: 4</td>
</tr>
<tr>
<td>Forest Management 123</td>
<td>Forest Economics</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 126</td>
<td>Wood Technology</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 133</td>
<td>Forest History &amp; Policy</td>
<td>F: 2</td>
</tr>
<tr>
<td>Forest Management 137</td>
<td>Forest Improvements and Recreation</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 120</td>
<td>Regional Silviculture</td>
<td>F: 3</td>
</tr>
<tr>
<td>Range Management 131</td>
<td>Range Plant Communities</td>
<td>F: 4</td>
</tr>
<tr>
<td>Range Management 180</td>
<td>Watershed Management</td>
<td>F: 4</td>
</tr>
<tr>
<td>English 111 (or 112)</td>
<td>Technical Writing or Advanced Writing Problems</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 134</td>
<td>Aerial Photo Interpretation</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 147</td>
<td>Forest Seminar</td>
<td>F: 2</td>
</tr>
</tbody>
</table>

### B—Timber Management

Students choosing the timber management option will add the following courses to those of the general forestry option and omit Range Management 131, 180, Forest Management 119:

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Management 116</td>
<td>Seeding and Planting</td>
<td>F: 2</td>
</tr>
<tr>
<td>Forest Management 125</td>
<td>Logging</td>
<td>F: 3</td>
</tr>
<tr>
<td>Forest Management 129</td>
<td>Mechanical Properties</td>
<td>F: 2</td>
</tr>
<tr>
<td>Forest Management 130</td>
<td>Milling and Products</td>
<td>F: 4</td>
</tr>
<tr>
<td>Forest Management 131</td>
<td>Forest Products Marketing</td>
<td>F: 3</td>
</tr>
<tr>
<td>Zoology 105</td>
<td>Forest Entomology</td>
<td>F: 3</td>
</tr>
<tr>
<td>Botany 140</td>
<td>Forest Pathology</td>
<td>F: 4</td>
</tr>
</tbody>
</table>
C—Forest Recreation Management

Students choosing the Forest Recreation Management option are required to take the same schedule as General Forestry with the exception of Animal Husbandry 1 and 2 plus the following courses:

<table>
<thead>
<tr>
<th>Department, Course No.</th>
<th>Course Name</th>
<th>Quarter taught and credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F  W  S</td>
</tr>
<tr>
<td>Landscape Architecture</td>
<td>130 Recreational Planning</td>
<td></td>
</tr>
<tr>
<td>Forest Management</td>
<td>138 Recreational Land Classification</td>
<td></td>
</tr>
<tr>
<td>Forest Management</td>
<td>139 Recreational Structures</td>
<td></td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>120 Roads and Pavement</td>
<td></td>
</tr>
<tr>
<td>*Landscape Architecture</td>
<td>3 Principles of Landscape Architecture</td>
<td></td>
</tr>
</tbody>
</table>

Description of Courses

1. Survey and Orientation. Survey of the profession of forest management, and the relation of conservation and multiple uses of wildland resources to the welfare of the state and nation. (2F) Turner; Floyd

10. Forest and Range Conservation. An introduction to conservation problems designed to acquaint students with the nature and extent of the renewable resources of the United States and the methods of conservatively using them. Open to all students except those registered in the College of Forest, Range, and Wildlife Management. (2W) Tocher

26. Wood Technology and Mechanical Properties of Wood. For vocational education or industrial arts majors. Covers structure, identification, and mechanical properties of commercial woods of the United States. (3W) Tocher

96. Forest Surveying. Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Lab Fee $5. (Summer camp 3 credits) Tocher; Daniel; Moore

97. Forest Practice. Field studies in inventories, successional stages, and growth of stands of trees. Study of forest soils and related land use. Lab fee $5. (Summer camp 4 credits) Tocher; Daniel; Moore; Turner

103. Silviculture and Dendrology. Basic Silvics; Silvicultural systems; western conifers and western regional silviculture; and elements of eastern hardwoods and types. Not open to forest management majors. Prerequisite, Range 126, Summer Camp. (4F) Daniel

104. Forest Management and Economics. Organization of a forest for production; surveys, normal and actual growing stock, determination of allowable harvest, management plans; economics influencing management. Not open to forest management majors. Prerequisite, Forestry 103. (3S) Moore

106. Forest Measurements I. Measurements of timber in log, tree, and stand; log rules and scaling; statistical methods useful in analyzing forest data; timber cruising practices. Prerequisite, Summer Camp. (4W) Moore

107. Forest Measurements II. Volume and yield table compilation; growth of even-aged, all-aged, and residual cutover stands. Prerequisite, Forestry 106. (3S) Moore

112. Dendrology I. Hardwoods. Identification, distribution and silvics of the more important forest trees in the United States. Prerequisite, Summer Camp. (3F) Staff

113. Dendrology II. Conifers. Identification, distribution, and silvics of the more important forest trees in the United States. Prerequisite, Summer Camp. (2W) Staff

*Taken in spring quarter of freshman year
114. Silviculture I. Characteristics of the tree species which influence silvicultural practice in the United States. Prerequisites, Summer Camp, Range 126, Forestry 112, Botany 120. (3W) Daniel

115. Silviculture II. Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite, Forestry 114. (3S) Daniel

116. Seeding and Planting. Seed collection, extraction and cleaning methods; germination testing; storage of forest tree seeds; practical experience in field planting and nursery work. Prerequisite, Forestry 115. (2S) Daniel

118. Forest Protection I. Prevention, suppression and suppression of forest and range fires, including economic and physical effect; fire behavior. Field trips. (3F) Floyd

119. Forest Protection II. Problems of administration and economics in protecting forests from biological enemies. (3W) Floyd

120. Silviculture III. Regional silviculture of the United States. Prerequisite, Forestry 115. (3W) Daniel

121. Forest Management. Physical factors influencing the regulation of a forest for sustained yield; site, growing stock and rotation; compilation of data for management plans. Prerequisites, Forestry 107, 115. (4F) Moore

122. Forest Valuation. Determination of monetary values in forest growing stock and land. Analysis of alternative management methods by use of standard valuation techniques. Prerequisite, Forestry 121. (4W) Staff

123. Forest Economics. Economic problems involved in the utilization of forest land and timber, and in the distribution of forest products. Prerequisite, Forestry 122. (3S) Staff

125. Logging. Principles and methods of harvesting wood products, with emphasis on cost, values, and the application of forestry to the harvesting process. Prerequisite, Forestry 97. (3F) Moore

126. Wood Technology. Structure and identification of the economic woods of the United States. (3F) Tocher

129. Mechanical Properties. Factors affecting the strength of wood. (2W) Tocher

130. Milling and Products. Manufacturing, grading, seasoning and preserving lumber, including a study of the wood-using industries and their products. (4S) Tocher

131. Forest Products Marketing. Principles of marketing applied to lumber and other forest products. (3S) Staff

132. Public Land Administration. Organization and functions of conservation agencies affecting range, forest, and wildlife administration; personnel management problems. (3W) Floyd

133. Forest History and Policy. Development of federal, state, and private forest policy. (2W) Turner

134. Aerial Photo Interpretation. Elements of photogrammetry; use of aerial photographs in mapping vegetation types and estimating timber volumes; construction of planimetric maps from vertical photographs. (3F) Tocher

137. Improvements and Recreation. Recreational use of forests and the classifications and planning of areas suitable for this purpose. Field trips. (3S) Floyd

138. Recreational Land Classification. Land classifications and economics of various forms of forest recreational use. (2F) Floyd

139. Recreational Structures. Construction of various forest recreational facilities. (3W) Tocher
145. Forest Problems. Individual study and research upon a selected forestry problem approved by the instructor. (1-3F, W, S) Staff

146. Junior Field Problems. Study of forest operations. Fee $40. (3S, Junior year) Staff

147. Forest Seminar. Systematic review of forestry. (2S) Floyd


204. Forest Ecology. Study of past and present distribution of forest species and forest types and the physical-biological basis of distribution and growth performance. (3W) Turner

205. Silviculture. Intensive study of a particular region by individual students. Group work consists of advanced treatment of silvics and silviculture, with emphasis on physiological aspects of both subjects. (3W) Daniel

206. Forest Management and Valuation. Application of forest management principles; forest organization and development; forest regulation, valuation and control of operations. (2F) Moore

207. Forest Protection. Advanced study in specialized fields of forest protection. (2F) Floyd

208. Forest Measurements. Application of statistical measurements to forest problems. (3F) Moore

210. Forest Problem. 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
COLLEGE OF HOME AND FAMILY LIVING

Child Development and Parent Education .................................................. 217
Clothing, Textiles and Related Arts ............................................................ 218
Foods and Nutrition ..................................................................................... 220
Household Administration ........................................................................... 222
Home Economics Education ......................................................................... 224
The College of Home and Family Living provides a well-rounded educational program, placing emphasis on both theory and skills as well as on human relationships. The major purpose of the College is two-fold: first, to prepare the student for more effective living both within the home and the community and; second, to prepare the student for a career other than homemaking if she so desires.

There is a career in Home and Family Living for everyone who is interested in the sciences and the arts that transform housekeeping into homemaking. Many combinations of subjects and occupational skills are possible and combine with full-time or part-time homemaking.

The major areas of interest are included in the following groups: Child Development and Parent Education; Foods and Nutrition; Clothing, Textiles and Related Arts; Household Administration; and Home Economics Education.

The chief professional opportunities open to graduates in the College of Home and Family Living are in addition to homemaking, teaching, extension service, institutional management, research, and home economics in business.

Completing all requirements leads to a Bachelor of Science degree in any one of the selected areas. Advanced work beyond the B.S. degree may lead to a Master of Science degree in any one if the areas.

Non-Majors—Men and Women

Both men and women who are preparing to pursue vocations other than in home and family living and realize that home economics courses can help them with time and money management, child development and family relationships, food and clothing selection, household furnishings, and other phases of efficient happy living will find courses in the college that will be of value to them. Not all women students who are enrolled in the University will choose to major in the College of Home and Family Living, but all women students are concerned with eventually becoming homemakers. The modern man, too, is vitally concerned with the various arts and sciences involved in homemaking. Non-majors may take any of the basic courses offered in any group, or they may select a minor in some one area of their choice.

Lower Division Requirements—See page 48

Core Requirements — All curricula in the College of Home and Family Living are based on a required core of courses designed to give a broad education for family and community living; They emphasize practical aspects of home economics and are planned to give students desirable basic training in activities related to successful management of a home. These requirements make up a large proportion of the work of the freshman and sophomore years. Courses which meet core requirements of the College of Home and Family Living are:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA 10</td>
<td>Introduction to Home Economics</td>
<td>1 credit</td>
</tr>
<tr>
<td>CTRA 4</td>
<td>Clothing Selection</td>
<td>2 credits</td>
</tr>
<tr>
<td>*CTRA 8</td>
<td>Clothing for the College Girl</td>
<td>3 credits</td>
</tr>
<tr>
<td>FN 5</td>
<td>Nutrition</td>
<td>3 credits</td>
</tr>
<tr>
<td>FN 24</td>
<td>Food Preparation</td>
<td>5 credits</td>
</tr>
<tr>
<td>CD 67</td>
<td>Children in the Family</td>
<td>3 credits</td>
</tr>
<tr>
<td>CD 68</td>
<td>Pre-school Laboratory</td>
<td>2 credits</td>
</tr>
</tbody>
</table>

*Pre-testing—a pre-test in clothing construction will be given entering students majoring in H.F.L. to determine if CTRA 8 should be taken. CTRA 4 and 25 will take the place of CTRA 8 in meeting core requirements if CTRA 8 is waived.
CHILD DEVELOPMENT AND PARENT EDUCATION

Professor, Carter (Head); Assistant Professors, Lewis, Eames; Head Teacher, Pre-school Laboratory and Cooperative Nursery, Holman.

Child Development is a desirable area of study for students who are interested in children either professionally or in terms of their role as prospective parents, or both. The major in child development should prepare students for a more satisfying role as parents, and professionally for teaching in, or conducting a nursery school; teaching in kindergarten or elementary school (with a teaching certificate); extension service positions in child development and parent education; and teaching in a nursery school in a welfare program, health center, housing unit, industrial plant, or children's hospital.

The curriculum for majors in Child Development and Parent Education includes the following: Child Development 80, 138, 150, 174, 175; an additional 18 credits to be selected from: Child Development 115, 125, 155; Art 50 or 151; English 122; Physical Education 81, 84; Psychology 105, 123; Sociology 160; Social Work 165, 177; Speech 118, 167; Zoology 113. Majors in the department are also required to take 6 hours credit in HA 10, CTRA 4, and FN 5, plus 9 hours selected from: CTRA 6, 8, 24; FN 24, 25; HA 65. These courses substitute for the general core requirements in the College of Home and Family Living. Residence in the Home Management House (HA 150) is available for child development majors but is not required.

Students who desire to minor in child development should take CD 175 for 3 hours credit, and include in their program CD 67, 68, 80, 174, and 175; in addition to 4 hours credit selected from other courses included in the child development major. The minor is recommended for men in such fields as social work and elementary education who, perhaps more than women in our culture, may benefit from an opportunity to study the young child in such a setting as the pre-school laboratory. For women, the child development major for students in the department or the child development teaching major for students in elementary education offers a more varied and extensive background in understanding and opportunity for increased skills in working with groups of young children.

Child development students who expect to teach in kindergarten or elementary school must meet the state requirements for certification. It is recommended that they take an elementary teaching certificate with their major in child development. The teaching certificate fills the requirement for a minor.

Courses

67. Children in the Family. To help students develop a philosophy of family living as desirable background for the child; understanding of reproduction, prenatal care; fundamentals of growth and development; and a beginning concept of guidance. (3F, W, S) Carter; Lewis

68. Preschool Laboratory. Directed observation in the University Preschool Laboratory. Recommended to parallel C.D. 67. (2F, W, S) Carter; Lewis

80. Guidance of the Young Child. Review of developmental principles with special emphasis on social-emotional growth; fostering growth through creative materials and play equipment; guidance philosophy, principles and techniques. Three lectures. Two hours lab. weekly, arranged at time of registration. Prerequisite: C.D. 67. (3F, W, S) Lewis; Eames

100. Human Growth and Development. Social, emotional, intellectual and physical development from birth to maturity. The influence of family, school, and other community institutions on development. General behavior characteristics of different levels of maturity; individual differences, and needs. (3F, W, S) Carter

125. Parent Education. Application of principles of child development and family relationships to educational programs for parents. (3F) Carter

138. Survey in Child Development. History of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration. Three lectures and a two-hour nursery school teaching laboratory weekly. (5S) Lewis

140. Special Problems in Child Development. For qualified students upon consultation with instructor. Spring quarter. Time and credit arranged.

155. Problems in Marriage and Family Living. A seminar to study current and emerging problems in marriage and family living, as they affect various family members. An opportunity to examine attitudes, relationships, and practices, and to gain greater understanding of the dynamics of marriage and family life. Prerequisites: C.D. 67, Psych. 53, and Soc. 60. (4F, W) Carter

174. Nursery School Methods. Must parallel 175. Study and collection of materials used in nursery school teaching, such as stories, pictures. Special consideration to understanding the needs of individual children in the nursery school and evaluation of procedures used in guiding them. (3F, W, S) Eames

175. Practice Teaching in the Nursery School. An opportunity to apply principles of child guidance in the nursery school. For juniors and seniors who have had a substantial amount of professional course work, including C.D. 80. Child Development majors and elementary education students with a teaching major in child development should register for 6 credits. Child development minors should register for 3 credits. Students must make arrangements for practice teaching well in advance of registration because of the limited number of students who can be accepted in the laboratory program. (3, 6F, W, S) Eames

176. Advanced Practice Teaching in the Nursery School. Continuation of C.D. 175. Additional opportunity to work with young children. One conference weekly with instructor. Prerequisite: C.D. 175. (4-6F, W, S) Staff


250. Seminar in Child Development. Discussion of current readings in child growth and development, with emphasis on development of insight and self-understanding. (2S) Carter

CLOTHING, TEXTILES AND RELATED ARTS

Associate Professors, Gilmore (Head), Johnson (Extension Clothing Specialist); Assistant Professor, Nyman; Instructor, Terasawa.

Students who elect Clothing, Textiles, and Related Arts as their major are required to complete the following courses in addition to the Home Economics core courses: Clothing 24, 25, 105, 112, 125, 126, 165, 170, 175, 185, 191; Household Administration 149, 150; (18 credit hours in the art department to include Art 1, 2, 30, 40, 115, 135, or their equivalents.)

Students who elect to minor in Clothing, Textiles, and Related Arts are required to complete the following courses in addition to Home Economics core courses: CTRA 24, 115, plus 7 hours of electives.

The Clothing, Textiles, and Related Arts Department in co-operation with other departments offers majors in the following fields: Textile Design and Research, Teaching of Clothing and Textiles, and Fashion Merchandising.

A Bachelor of Science degree and a Master of Science degree are offered in Clothing, Textiles, and Related Arts.
In addition to major requirements and Home Economics core courses, it is recommended that the following courses be taken when planning for a definite profession.

**Fashion Merchandising.** Those preparing for Fashion Merchandising may wish to complete a major in Clothing, Textiles, and Related Arts and a minor in Business Administration, or they may complete a major in Business Administration with a minor in Clothing, Textiles and Related Arts.

**Textile Research.** Those preparing for Textile Research should complete a double major in Clothing, Textiles, and Related Arts and Exact Science.

**Home Project.** A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing, Textiles, and Related Arts. Clothing 25 is a prerequisite. The project is turned into the department within the first two weeks of the Fall Quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

**Courses**

4. **Clothing Selection.** Wardrobe planning and buying for the college girl considering the principles of design in relation to the student's appearance, personality and needs; care and repair of clothing. (2F, W, S) Open to majors and non-majors. Terasawa

6. **Dress Construction.** Open to all college girls who have not had previous construction experience and wish to learn to sew. Construction of a speed project in cotton and a tailored dress. (3F, W, S) Gilmore

8. **Basic Clothing Construction.** Open to all college girls who have had previous experience in clothing construction and wish to develop further judgment in pattern and fabric selection; understanding and apply principles and techniques of elementary garment construction and fitting. Prerequisite: CTRA 4. (3F, W, S) Nyman; Terasawa

15. **Clothing Selection for Men.** Men's apparel as related to the wearer. Consideration is given fundamentals of fabric and garment selection. Organized to meet the needs of men from all colleges of the university. (2W) Gilmore


25. **Advanced Clothing Construction.** Consideration is given to alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, construction, and finishes. Prerequisites: CTRA 4, 6 or 8, 24, and Art 1 and prerequisite or parallel Art 2. (3W, S) Gilmore

27. **Household Textiles.** Consideration is given fabrics for household and personal use, stressing selection, utilization, care, and cost. Prerequisite: 24. (3S) Alternate years only. Taught in 1957-58. Gilmore

33. **Home Furnishings.** Practical experience in selecting, refinishing, and arranging home furnishings in relation to a specific problem. Laboratory includes elementary furniture upholstery, wood finishing, and the making of draperies. (3F, W, S) Nyman

41. **Weaving.** Fundamental principles of weaving. Emphasis on weaving for practical use—place mats and napkins; luncheon sets, cotton skirt, blouse or apron material; draperies, etc. (3W) Nyman

105. **History of Costume.** Shows social, economic and political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. (3F) Terasawa
112. **Costume Design.** A practical application of the principles and elements of design as applied to the designing and illustration of clothing. Prerequisites: Art 1 and 2, CTRA 4. Recommended, CTRA 105. (2W) Terasawa

115. **Art in Everyday Living.** Study of art elements and principles of design as applied to the home, and daily living. Prerequisites: CTRA and Home Economics Majors; Art 1 and 2. For others interested in Art enough to satisfy the instructor. (3F, W, S) Terasawa

125. **Draping.** Creative experience in dress designing by draping on the dress form. Emphasis placed on fitting and understanding the effect of pattern, grain, and textures on design and dress. Problems consist of making a French lining and draping two garments. Prerequisite: CTRA 25. Recommended, CTRA 170. (5W, S) Nyman, Terasawa

133. **Advanced Home Furnishings.** A laboratory course giving experience in furniture renovation. (3 Summer) Nyman

141. **Advanced Weaving Problems.** Advanced weaving problems. Pattern draft reading and proving drafts on paper to understand different weaves. Weaving for practical use of woolen or tweed material, stoles, drapery, and upholstery material, etc. Prerequisite: CTRA 41. (3S) Nyman

165. **Tailoring.** Application of techniques used in tailoring suits and coats. Prerequisite: CTRA 25. Recommended, CTRA 125. (3F, W) Gilmore

169. **Newer Development in Textiles.** Designed for teachers and advanced students of Clothing and Textiles. Class includes a study of fibers, finishes, and materials being placed on the market and economic conditions affecting their production as well as factors influencing choice and care of present day materials. Prerequisite: CTRA 24 or equivalent. (3 Summer) Gilmore

170. **Flat Pattern Designing.** Principles of designing and construction of patterns by flat pattern method; fitting and pattern alteration; development and use of a basic sloper. Prerequisite: CTRA 25. Recommended, CTRA 112. (5F, W) Terasawa

175. **Advanced Textile Problems.** Emphasis is placed on recent textile advances and research techniques. Consideration is given to physical and chemical testing and use of the microscope. Prerequisite: CTRA 24; Recommended: Chem. 10, 11, 12. Outside work required. Alternate years only. Taught in 1958-59. (3S) Gilmore

185. **Children's Clothing.** Clothing needs of children at different developmental levels from infancy to early elementary age in relation to total family clothing; selection and construction of children's garments; care and renovation of clothing. Prerequisite: CTRA 8. Recommended. CTRA 24. (3S) Terasawa

190. **Special Problems.** Independent study under direction of professor of a problem in CTRA in which upper division or graduate student has special interest or need. Consult department head before enrolling. Any quarter. Time and credit arranged. Gilmore

191. **Seminar.** Reports and discussions on current literature in Clothing, Textiles, and Related Arts. (2F, S) Staff

210. **Research for Master's Thesis.** Gilmore

290. **Special Problems.** Open to graduate students in Clothing, Textiles, and Related Arts. Time and credit arranged. Gilmore

291. **Graduate Seminar.** Open to graduate students in Clothing, Textiles, and Related Arts. (3S) Gilmore

**FOODS AND NUTRITION**

Professors, Vermillion, Wilcox, and Miller (Extension Nutritionist); Assistant Professor, Rowland; Instructor, Merkley.

Students majoring in Foods and Nutrition are required, in addition to the Home Economics core, to complete the following courses: Foods and
Nutrition 25, 107, 140, 141, 144, 145, 146, 180; Household Administration 149, 150; Chemistry 10, 11, 12; Biochemistry 190.

Students majoring in Institutional Management must meet the requirements for the Foods and Nutrition major and, in addition, must take the following courses in order to meet the requirements for an internship as set up by the American Dietetics Association: Bacteriology 10; Physiology 4; Psychology 53; Economics 51; Sociology 70; Business Administration 109; Psychology 102; Education 120; Foods and Nutrition 182; Accounting 100. A fifth year of internship in some approved hospital, restaurant, or school qualifies one to become a professional dietitian.

The Foods and Nutrition department offers opportunity for study and research toward the Master of Science degree. The following courses are offered on the graduate level: Foods and Nutrition 201, 202, 203, 207, 210, 243, 290, and 291.

**Courses**

5. **Principles of Nutrition.** The relation of food to the health of the family; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. Open to all students. (3F, W, S) Rowland

24. **Food Selection and Preparation.** Principles of food selection and preparation. Open to all students. Three lectures and two labs. (5F, W, S) Rowland

25. **Meal Preparation for the Family.** Planning, preparing and serving meals for the family. Consideration is given to nutritional adequacy of meals at different income levels. Prerequisite: Foods 24. (3F, W, S) Merkley; Rowland

26. **Food for the Family.** (For Home-Study only) Designed to meet the needs of the woman who is still living in her own home but desires to continue her education with the idea that she will one day be certified for teaching in the secondary schools. The course involves both the basic principles and the techniques of food preparation, planning and preparing meals for the family and a general review of the newer aspects of nutrition.

Students are to be permitted to take the course under the following conditions: They must have had a minimum of two years of practical experience and must still be active in planning and preparing food for the family of four or more persons so that they may use their own kitchen as a laboratory. It is recommended that the student plan to have at least three extended conferences with the instructor during the period of the home study. This course is not open to those who have had F & N 24 and 25.

28. **Food for Special Occasions.** Emphasis on organization and planning with due consideration to money, energy and time expended. Prerequisite: F & N 24. Open to all students. (3S, S) Vermillion; Merkley


140. **Advanced Nutrition.** The fundamental principles of human nutrition and their application to the individual and family group. Prerequisite: Organic Chemistry. (3F, W) Merkley; Wilcox

141. **Advanced Nutrition.** Nutritional requirements of the mother during pregnancy and lactation; nutrition of child through infancy to adolescence. (2S) Offered in 1958-59. Wilcox

144. **Laboratory Methods in Foods and Nutrition.** Problems in foods and human nutrition including nitrogen, mineral and vitamin determinations, a dietary study, and a project in animal experimentation. Prerequisites: Organic Chemistry (2W) Wilcox
145. Diet Therapy. Application of dietetic principles to problems of disease with calculation of dietaries in disease. Prerequisite: Nutrition 140. (4S) Wilcox

146. Food Technology. Manufacture and preservation of food products and influence of those processes on physical, chemical, and nutritive values of foods. Prerequisites: Bacteriology 10, Foods 24. (2F) 2 lectures; 1 two-hour lab. Merkley

180. Quantity Food Preparation. Application of the principles of food cookery, applied to large quantity preparation. Standardization of food quality, production costs and menu planning studied. College food service units used as laboratories. Open to juniors and seniors majoring in dietetics or institutional management. (5W) Offered in 1958-59. Vermillion


184. Cost Control in Food Institutions. Varied aspects of money management as it affects food service in institutions. (2W) Staff

190. Special Problems. Open to qualified students majoring in Foods and Nutrition upon consultation with instructor. (F, W, S) Time and credit arranged. Vermillion, Wilcox, Merkley

201. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral and vitamin determinations. Prerequisite: Chemistry 190 or 191, or equivalent. (F, W, or S) Time and credit arranged. Wilcox


203. Nutrition Laboratory. Microchemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chemistry 190 or 191, or equivalent (F, W, S) Time and credit arranged. Wilcox


210. Research for Master’s Thesis. Credit arranged. Wilcox

243. Recent Development in Nutrition. Study of problems in nutrition selected according to needs of students. Prerequisite: Nutrition 140. (2W, S) Wilcox

290. Special Problems. Open to graduate students in Foods and Nutrition. (F, W, S) Time and credit arranged. Vermillion

291. Graduate Seminar. Open to graduate students in Foods and Nutrition. (F, W, S) Time and credit arranged. Wilcox

HOUSEHOLD ADMINISTRATION

Professor, Bate; Associate Professor, Gardner (Extension Specialist).

The College of Home and Family Living offers a non-vocational major administratively centered in the department of Household Administration. The purpose of this major is to make available to women whose primary interest is in the enrichment of their own personal and family living, a program expressly designed to meet their own individual interests and needs. The major program provides the following features:

A core program in Home and Family Living, providing introduction to the various fields of home economics.

An individually tailored major in Home and Family Living. Thirty hours (30) are required for a major in the University. H. A. 149 and 150 or 151 must be included in the thirty hours. Students who select this program
may choose the courses that apply toward their major from any of the various departments in the College of Home and Family Living.

A minor of the student’s own choice in any department, or combination of related departments, preferably outside the College of Home and Family Living.

Opportunity for great selectivity in choosing the balance of the program to meet individual interests and needs. This includes sixty-one hours of electives which may be selected from the academic offerings of the entire University.

**UNIVERSITY REQUIREMENTS:**

Basic Communications ........................................ 9 hours
P. E. ....................................................................... 6 quarters
Group Requirements (not less than 8 or more than 12) .... 40 hours

- Biological Science
- Exact Science
- Language and Arts
- Social Science

Total ........................................................................ 55 hours

**HOME AND FAMILY LIVING CORE REQUIREMENTS:**

HA 10—Introduction to H. Ec. ................................... 1 hour
CTRA 4—Clothing Selection .................................... 2 hours
CTRA 8—Basic Clothing Construction .................... 3 hours
FN 24—Food Preparation ...................................... 3 hours
FN 5—Nutrition .................................................. 3 hours
FN 25—Meals for the Family ............................... 3 hours
CD 67—Children in the Family ......................... 3 hours
CD 68—Preschool Lab .......................................... 2 hours

Total ........................................................................ 22 hours

Major: Thirty (30) credit hours to be selected from the courses listed in the College of Home and Family Living ............. 30 hours

Minor: Eighteen (18) credit hours to be selected in any area of the student’s choice but preferably not within the College of Home and Family Living .... 18 hours

Electives .................................................................... 61 hours

The following list is suggested to give some guidance in selecting electives:

- Mngt. 29. Managing Personal Finances (5).
- Soc. 60. Courtship, Marriage and the Family. (3); 144, Women Today (3).
- Soc. Wk. 162. Mental Hygiene (3).
- F.A.A. 30. Art Understanding and Appreciation (3); 40. Essentials of Interior Decoration (3).
- Spch. 5B. Public Speaking (3).
- Eng. 46. The Bible as English Literature (5); 122. Children's Literature (3); 123. Literature for the Adolescent (3).
Courses

10. Introduction to Home Economics. A course designed to help freshmen students become better adjusted to college life. Includes help with the library, studying, and how to understand the use of the university catalog. Special help is given on the selection of a major in Home Economics. (1F) Vermillion, Lewis

65. Housing. Presents housing needs and practices affecting housing construction and home ownership, also includes evaluation of house plans. (3F, W, or S) Bate

100. Household Equipment. Selection, method of operation, and maintenance of equipment used in the home, with emphasis on kitchen and laundry equipment. (2W, S) Bate

149. Home Management. Principles of household management. Includes a philosophy of homemaking, use of human and material resources, and improvement of housing as is related to family living. (3F, W, or S) Bate

150. Home Management House. Residence students are directed in practical management of home experiences. Required of all Home Economics majors. Elective for other students upon consultation with the advisor of Home Management House. Prerequisites: H.Ad. 149; F. & N. 24 and 25. Time arranged. (4F, W, or S) Bate

155. Family Finance. Includes the study of personal and family finance with emphasis on finance plans and investments. (2F, or W) Bate

160. Special Problems. Individual study of management problems in which upper division student wants special help. Consult department head for arrangement. (F, W, or S) Time and credit arranged. Bate

HOME ECONOMICS EDUCATION

Assistant Professor, Harder (Head); Instructor, Merkley.

A Bachelor of Science degree and a Master of Science degree may be earned in Home Economics Education.

The following professional program prepares graduates for teaching courses in homemaking. It certifies graduates to teach all phases of homemaking in Utah schools, including federally aided schools.

It is important that students register with the instructor for Education 121 and 122 two quarters before they plan to do their student teaching. This provides the time necessary to obtain co-operation of schools in setting up teaching assignments for those registering in these courses.

Lower Division Requirements

In addition to the Home Economics core courses, the following lower division courses are required to meet Utah certification requirements in Home Economics Education: Child Development 80; Sociology 60; Clothing, Textiles and Related Arts 24, 25, and 33; Household Administration 65; Foods and Nutrition 25.

To meet college group requirements, the student planning to major in Home Economics Education needs to keep in mind:

1. Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 53.
2. Elective recommendations: Students are advised to consider developing a subject interest into a teaching minor; e.g., Art; Secretarial Science; English; Music; Physical Education; Social Science; etc.
3. Home Project: A home project carried out during the summer following completion of CTRA 25 is required of all majors in Home Economics Education and Clothing, Textiles and Related Arts. The project is turned in to the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.
Upper Division Requirements

Clothing, Textiles and Related Arts 115, 165
Foods and Nutrition 140, 146
Household Administration 149, 150, 155
Child Development 125
Psychology 102
Public Health 155
Education 112, 114, 120, 121, 122

One of the following Education (classes must be elected: 111, 113, 161.)

Sufficient other electives to total 60 credits upper division work.

Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools

A total of thirty-three credits in professional education, including Public Health 155, must be presented to meet the requirements for the General Secondary Certificate and the Vocational Homemaking in Secondary Schools Certificate. Special courses recommended for Certification in Vocational Homemaking Education are listed with Upper Division requirements. These professional courses plus the prescribed subject matter courses in Home Economics are necessary for certification in Vocational Homemaking Education in Secondary Schools.

Types of service available to teachers:

1. Special guidance and help are given teachers who wish to return to school to meet requirements for renewing their certificates.

2. Opportunity to meet certification requirements is offered teachers or other persons.

3. Advanced study leading to Master of Science degree in Home Economics Education is offered.

Home Economics Education of the College of Home and Family Living provides adequate foundation for graduate study for students who wish to continue beyond the bachelor degree. Courses are offered which lead to the Master of Science degree with a major in Home Economics Education. Training in Home Economics Education meets the needs of the teacher interested in more effectively serving those whom they teach.

Graduate study may be planned to include areas of family relations, child development, foods and nutrition, clothing, textiles and related arts, psychology, sociology, or in any other area that would contribute meaningfully to more dynamic Home Economics programs.

Extension Service Curriculum

Requirements for entering the Extension Service as County Home Demonstration Agents:

Completion of Home Economics Education curriculum as outlined, and in addition:

Extension Methods 151 .................................................................3

Other recommended courses are:

Journalism 12 or 112 .................................................................3
Public Speaking 5 .................................................................3
Sociology 141 ...........................................................................3

A 3-month training period in a county under supervision is advised of prospective Home Demonstration Agents. Plans for this training are made with Director of Extension Service.
Courses

Education 120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Understanding students, homes, families, and communities. Guiding and evaluating pupil development. Analysis of teaching situations based upon observation of school activities. Prerequisite or parallel: Psych. 102. (3F or S)

Education 121. Problems in Teaching Home Economics. Study of recent investigation in Home Economics and General Education and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) This course should be blocked with Education 122 and with one other 3-hour Education course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W, S)

Education 122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangements with University. Student teacher leaves campus the middle five or six weeks of Fall, Winter, or Spring quarter and teaches a full homemaking program each day in an approved school. Prerequisites: Ed. 120, 121. (8F, W, or S)

199. Special Problems in Home Economics Education. Developed around individual needs of students not otherwise provided for in curriculum. (1-2 F, W, S)


<table>
<thead>
<tr>
<th>Subject</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>228</td>
</tr>
<tr>
<td>Philosophical Literature</td>
<td>229</td>
</tr>
<tr>
<td>Pre-Medical Training</td>
<td>230</td>
</tr>
<tr>
<td>Pre-Dental Training</td>
<td>231</td>
</tr>
<tr>
<td>Bacteriology and Public Health</td>
<td>232</td>
</tr>
<tr>
<td>Chemistry</td>
<td>234</td>
</tr>
<tr>
<td>English and Journalism</td>
<td>239</td>
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<td>English</td>
<td>239</td>
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<tr>
<td>Journalism</td>
<td>242</td>
</tr>
<tr>
<td>Photography and Photographic Journalism</td>
<td>244</td>
</tr>
<tr>
<td>Geology</td>
<td>244</td>
</tr>
<tr>
<td>Landscape Architecture and Planning</td>
<td>246</td>
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<tr>
<td>Liberal Studies</td>
<td>247</td>
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<td>Mathematics</td>
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<td>Modern Languages and Latin</td>
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<td>Speech</td>
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<td>Zoology</td>
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<tr>
<td>Entomology</td>
<td>261</td>
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<tr>
<td>Physiology</td>
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</tbody>
</table>
Besides training students for studies in the technical divisions of the Institution, the University College enables all students in the University to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never been so urgent as now. Such understanding is the surest path to permanent peace. Many courses in the College qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of the College also enable students to major in these departments and thus begin preparation for their careers.

The University College includes the departments of Bacteriology and Public Health, Chemistry, English and Journalism, Photography and Photographic Journalism, Geology, Landscape Architecture and Planning, Mathematics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology, and Physiology.

**GENERAL EDUCATION**

**Two-Year Program**

Students may earn the title of "Associate in Arts" or "Associate in Sciences" and a two-year diploma by completion of a program in basic education. It is believed that the prescribed studies will be very helpful to any student, whether he completes only two years of college or whether he continues until he receives a B.S. degree. Although the total number of credit hours required in this program is larger than that required for the completion of the "group requirements" now current, the student may also specialize to some extent in these first two years of college.

The courses, which are drawn from the University College and the Colleges of Business and Social Sciences, and Education, are outlined by the Adviser of Liberal Studies, and vary with the field of concentration chosen by the student.

**INTEGRATED COURSES**

The following are broad courses which may be used to satisfy group requirements. They are listed here to facilitate selection and advisement.

**Biology**

Administered by the staffs of the Departments of Bacteriology and Public Health, Botany and Plant Pathology, Zoology, Entomology, and Physiology.

1. **Principles of Biology.** Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environments, kinds of living things, reproduction, development, inheritance, and evolution. Five lectures. (5F, W, S, or Su) **Staff**

**Physical Science**

Administered by the staffs of the Departments of Chemistry, Geology and Physics.

31, 32, 33. **Physical Science.** Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, and physics integrated for use in interpreting human experiences. Intended to meet the physical science group requirements upon completion of all three quarters. (3F, 3W, 4S) **Staff**
Humanities (Languages and Arts)

English 34, 35, 36—Great Books and Ideas.
English 40, 41—World Literature.
English 53, 54—American Literature.

In addition it is recommended that the student complete at least one of the following:

English 48—Modern European Literature.
English 58—Modern American Literature.
English 68—Modern English Literature.

Also it is recommended that the student complete one of the following:

Art 3; 26; 36.
Music 1; 90.

Two years of a foreign language are also recommended as an option for satisfaction of the Languages and Arts, or Humanities, group requirement.

Social Science

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

History 5. Modern World Civilization. The cultural heritage of the world from the sixteenth century to the present. Emphasis on European civilization and its spread—the Americas, the Near and Far East. (5W) Ellsworth

(Political Science 1—Government and the Individual, General Social Science and History 13, 14—United States History, are also recommended.)

Students are encouraged to broaden their liberal education with other courses in basic sciences and humanities, landscape architecture, political science, economics, and sociology.

PHILOSOPHICAL LITERATURE

Most of the courses listed below have been cross-referenced from other departments. The major part of their content is philosophical. They are assembled here for the convenience of students interested in the interpretations which philosophers have made of man and his place in the universe. They afford opportunities for both teacher and student to apply philosophical principles to the solution of problems in various fields of human thought and action.

The philosophical content in many other courses in History, Political Science, and Literature is rich. Such courses as Ancient World Civilizations and Modern World Civilizations (History 4 and 5) are invaluable to one wishing to understand the development of human thought.

It is recommended that students take advantage of the instruction in religious philosophy offered by the churches of Logan. Of such work, those courses classed as non-secular yield college credit.

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

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

48. Modern European Literature.

58. Modern American Literature.

68. Modern English Literature. (See English dept. for write-up and staff)

117, 118, 119. American Political Thought. The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, modes of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Students may register for one, two or three quarters. (2F, 2W, 2S) Political Science 117, 118, 119.

131. Organic Evolution. Critical study of the facts of evolution as obtained from consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: Zoology 1 or 2, or 3 and 4. 111 and 112 recommended. (3W) Gardner

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

140, 141, 142. Ancient, Medieval, and Modern Philosophers. Works and ideas of major philosophers. (See Modern Language Department.)

145, 146. History of Political Thought. No. 145 covers political theories and ideas from the Greek period to Martin Luther. No. 146 continues the study of political theories from Luther to 18th Century. Students may take either or both quarters. (3F, 3W) Political Science 145, 146.

147, 148, 149. Comparative Literature. (See English dept. for write-up and staff.)

150. Recent Political Thought. Political ideas and writers from the close of the 18th Century to the present with emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3S) Political Science 150.

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

PRE-MEDICAL TRAINING

The University College offers the courses to provide a pre-medical training that satisfies entrance requirements of medical schools in the United States and Canada.

Suggested Pre-Medical Schedule

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Sophomore</th>
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<tbody>
<tr>
<td>English 1, 2, 3</td>
<td>F 3 W 3 S 3</td>
</tr>
<tr>
<td>Chem. 3, 4, 5</td>
<td>F 5 W 5 S 5</td>
</tr>
<tr>
<td>Math. 34, 35, 44 or 46</td>
<td>F 3 W 5 S 3</td>
</tr>
<tr>
<td>Air Sci. or Military Sci.</td>
<td>F 1 W 1 S 1</td>
</tr>
<tr>
<td>Electives</td>
<td>F 3 W 3 S 3</td>
</tr>
<tr>
<td>Total</td>
<td>F 15 W 17 S 17</td>
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</table>

<table>
<thead>
<tr>
<th>Junior</th>
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<tbody>
<tr>
<td>Chem. 121, 122</td>
<td>F 5 W 5 S 5</td>
</tr>
<tr>
<td>Zoology 112</td>
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<tr>
<td>Zoology 118</td>
<td>F 5 W 5 S 5</td>
</tr>
<tr>
<td>Chem. 115</td>
<td>F 7 W 7 S 12</td>
</tr>
<tr>
<td>Electives</td>
<td>F 7 W 7 S 12</td>
</tr>
<tr>
<td>Total</td>
<td>F 17 W 17 S 17</td>
</tr>
</tbody>
</table>

Recommended electives are Scientific Vocabulary (Eng. 5), Psychology, College Grammar, Technical Writing, History, Political Science, Sociology, Economics, Philosophical Literature or other literature classes. Some medical schools require and a number recommend Comparative Anatomy.
Pre-medical students interested in graduation from this College before attending medical school may major in any subject in which they are interested.

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

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

**MEDICAL TECHNOLOGY**

The University College offers courses which satisfy entrance requirements for Medical Technology internships in the United States, Canada, and Hawaii. A two-year program is required to complete minimal requirements. However, the college provides a three-year course which combined with the internship qualifies a student for the B.S. degree. For this degree program the college has affiliations with the L. D. S. Hospital in Salt Lake City, St. Benedict’s Hospital in Ogden, and Thomas Dee Memorial Hospital in Ogden. At the satisfactory completion of the internship, the student is qualified to take the registration examination given by the Registry of Medical Technologists of the American Society of Clinical Pathologists.

For further details contact Dr. Paul Carter in the Department of Bacteriology and Public Health.

**PRE-DENTAL TRAINING**

Students planning to enter the profession of dentistry may take the necessary courses in the University College to satisfy requirements for admission to any school of dentistry in the United States.

**Suggested Pre-Dental Schedule**

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<tr>
<th></th>
<th>F</th>
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<tbody>
<tr>
<td><strong>Freshman</strong></td>
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<tr>
<td>Chemistry 3, 4, 5</td>
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<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mathematics 34, 35, 44 or 46</td>
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<td>5</td>
<td>3</td>
</tr>
<tr>
<td>English 1, 2, 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electives (optional)</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td><strong>Sophomore</strong></td>
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<tr>
<td>Zoology 3, 4</td>
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<td>5</td>
<td></td>
</tr>
<tr>
<td>Physics 17, 18, 19</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Air Science or Military Science 4, 5, 6, or P. E.</td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electives (optional)</td>
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<td>6</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td>17</td>
<td>17</td>
</tr>
<tr>
<td><strong>Junior</strong></td>
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<tr>
<td>Chemistry 121, 122</td>
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<td>5</td>
<td></td>
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<tr>
<td>Zoology 118 or 119</td>
<td>5 or 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

*Students with unusually good records may sometimes be accepted after two years of pre-dental work. In this case the required courses included in the three-year program listed above must be completed in two years.

Recommended electives are Psychology, History, Political Science, Sociology, Economics, Scientific Vocabulary, and other English courses.
Students planning to receive a B.S. degree on a combined curriculum (three years here and one year in a medical or dental school) must fulfill the group and English composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

**B. S. in Nursing**

Persons who have Registered Nurse credentials may pursue studies toward their bachelor of science degree. Credits earned toward the R. N. are applied toward the B. S. as evaluated by the Registrar. Such students may be graduated with a major in Nursing or they may elect to complete their college work in some such field as Public Health or Bacteriology.

**BACTERIOLOGY AND PUBLIC HEALTH**

W. Whitney Smith, Professor and Head of Department; Kenneth R. Stevens, Professor; Lewis W. Jones, Associate Professor; Paul B. Carter, Assistant Professor; John H. Carlquist, Special Professor; Homer H. Clark, Russell S. Fraser, Earl L. Fillmore, Reed A. Roberts, Special Assistant Professors. Special staff members from the Cache Valley Medical and Dental Associations.

**Bachelor of Science Degree**

General Bacteriology majors should take: Bact. 10 or 70, 71, 101, 104-105 or 120-121, 110, 160, 168, 172, 180, 291; Chemistry 3, 4, 5, 115, 121, 122, 191; Mathematics 35, 44; Physics 17, 18, 19; Public Health 60; Botany 24, 25; Zoology 3, 4; Library Science 100.

Public Health Majors should take: Public Health 15, 50, 150, 151, 155, 156; Bacteriology 10 or 70, 71; Dairy 6; Physiology 4 or 120; Zoology 3, 4, 111, 116.

Clinical (Medical Laboratory) Technology Majors should take during their first, second and third years: Bact. 70, 71, 101, 131, 160, 161, 168, 172, 291; Chemistry 3, 4, 5, 12, 17, 18, 190; Physiology 4; Physics 6, 7; Public Health 50; Zoology 3, 4, 116, 120; and meet all college requirements except for total credits and upper division. A hospital internship for twelve months shall be completed during the fourth year, which shall include instruction in Bact. 133, 134, 135, 136, 137, 138, 139. Utah State University has made provisions for instruction of laboratory technicians in this internship in the W. H. Groves L. D. S. Hospital in Salt Lake City or the Thomas Dee L. D. S. Hospital in Ogden. During this fourth year, students register for three quarters. When this program is satisfactorily completed, students are eligible for the Bachelor of Science degree in Medical Technology. The student may then also apply for certification by the Registry of Medical Technologists after completion of a qualifying examination given by the American Society of Clinical Pathologists. (Consult Paul B. Carter for further details.)

Health Education majors should consult H. B. Hunsaker.

Minors in Health Education should take: Public Health 15, 50, 150, 156; Physical Education 135, 145; Foods and Nutrition 6; Psychology 145 and Child Development 67.

**Master of Science in Bacteriology**

Research and graduate courses are available in various specialized subjects, with strong support from related departments and agencies. Courses numbered 200 and above are designed for graduate students. Courses 110, 120, 131, 150, 156, 161, 168, and 180 may be used for credit by graduate majors in Bacteriology.

**BACTERIOLOGY**

1. **Principles of Biology.** Basic life principles illustrated in both plant and animal forms. Designed in combination with Bact. 10 or Physiol. 4 to meet the biological science requirements of the college. (5F, W)  

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

Smith; Stevens; Carter

70. **General Bacteriology.** For majors in science departments. (Not open to students who offer credit in Bacteriology 10.) Three lectures. Not offered 1957-58.  

Staff

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

Smith; Jones; Carter

101. **Systematic Bacteriology.** Classification relationships. Prerequisite: Bact. 10 or 70. Two lectures. (2S) Alternate years, not taught, 1957-58. Smith

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

Jones

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

Jones

110. **Soil Microbiology.** Relationships of microorganisms to soil fertility. Prerequisite: Bact. 10 or 70. Two lectures. (2W) Alternate years. Not offered 1957-58.  

Jones

120. **Food Microbiology.** Relationships of microorganisms to food preservation, spoilage, and poisoning. Prerequisite: Bact. 10 or 70. Two lectures. (2F) Alternate years. Not offered 1957-58.  

Smith

121. **Food Microbiology Laboratory.** (2F) Not offered 1957-58.  

Smith

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

Carter

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

- Clinical Bacteriology and Serology 2 months Carquist; Clark
- Clinical Biochemistry 3 months Carquist; Clark
- Clinical Hematology 1 month Carquist; Clark
- Pathological Tissue Methods 2 months Carquist; Clark
- Blood Bank Procedures 2 months Carquist; Clark
- Electrocardiograph and Basal Metabolism Procedures (13F, W, S) Carquist; Clark

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

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

Clark

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

Clark

139. **Pathological Conference.** (1S)  

Carquist; Clark

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

Carter

161. **Advanced Pathogenic Microbiology.** Common pathogenic molds, yeasts, and viruses. Prerequisite: Bact. 160. Four lectures, one lab. Not offered 1957-58.  

Carter

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

Carter

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

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

Jones

190. **History of Bacteriology.** (2S) Not offered 1957-58.  

Jones

291. **Seminar.** (1F, W, S)  

Staff

294. **Special Problems in Bacteriology.** Special assignments, reports, and discussions. Preparation of a comprehensive and critical review. Time and credit arranged. Prerequisite: consent of instructor.  

Staff

299. **Thesis Research.** Time and credit arranged.  

Staff
PUBLIC HEALTH

Public Health courses do not satisfy biological science group requirements.

15. Personal Health. Health problems of college students; especially designed for freshmen and sophomores. Two lectures. (2F, W, S) Stevens, Smith, Members of Cache Valley Medical Association and Dental Association

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

150. Environmental Sanitation. Biological background; control of air; insect; water; rodent; refuse; and food-transmitted diseases; housing, camping, and school sanitation. (4F) Smith


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

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

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

256. School Health Methods for Secondary Schools. (3Su) Staff

CHEMISTRY

Melvin C. Cannon, Professor and Department Head; Delbert Greenwood, Theodore M. Burton, Professors; Harris O. Van Orden, Norman Bauer, Garth L. Lee, Associate Professors; Lowell G. Tensmeyer, G. Olof Larson, Assistant Professors; Sherwin Maeser, Professor Emeritus; Harold M. Nielsen, L. Elmer Olson, Research Assistant Professors; Theral V. Bishop, Research Associate (Statistician).

Bachelor of Science Degree

The degree of Bachelor of Science in Chemistry is a professional degree. Graduates who meet the requirements of the American Chemical Society by which the Department is accredited, and who fill the group requirements of the University as given in the introduction of this catalog, will be certified by the Society. Completion of the suggested schedule below will enable the student to meet all of these requirements.

It is recommended that students desiring a minor in Chemistry complete a minimum of 8 credits of upper division chemistry courses. Suggested courses which will meet these requirements are: Chemistry 101, 115, 121, 122, 190, 191.

Teaching Majors

Chemistry: Students desiring to complete a teaching major in chemistry should complete the following minimum program: Chemistry 3, 4, 5, 101, 115, 121, 122, and 190 or 191. Supporting courses to be taken are Physics 17, 18, 19 and Mathematics 35, 46, and 97.

Physical Science: For a composite teaching major in physical science the following minimum schedule is recommended: Chemistry 3, 4, 5, 12 or *On leave.
121, 101 or 190; Physics 20, 21, 22, 120, 121; Mathematics 35, 44 or 46, 97, 98, 99.

Required professional education courses for the teaching certificate are listed by the School of Education.

Graduate Program in Biochemistry and Nutrition

A graduate program in Biochemistry and Nutrition leading to a Master of Science or a Doctor of Philosophy degree is available in cooperation with departments giving courses in these areas. Detailed information may be obtained from the department or from the Dean of the Graduate School.

Chemical Engineering

The student interested in obtaining a degree in Chemical Engineering may pursue the first two years of the program in the University. Courses taken under this program will be accepted at other Universities giving the degree. Following the completion of the first two years of study, the student should register in the Chemical Engineering Department at the University of Utah, or another school of his choice. The proposed curriculum of study for Chemical Engineering is listed in this catalog under Engineering.

To aid students in registering, the following suggested schedule is given.

Suggested Schedule

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

<table>
<thead>
<tr>
<th>Course</th>
<th>F</th>
<th>W</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td>Chemistry 3, 4, 5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Mathematics 35, 46, 97</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>English 1, 2, 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Military or Air Science or Physical Education</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

B. For students who enter college with credit for only 1 unit of algebra and ½ unit of geometry:

<table>
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<th>Course</th>
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<tr>
<td>Mathematics 34, 35, 46</td>
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<td>5</td>
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</tr>
<tr>
<td>English 1, 2, 3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Military or Air Science or Physical Education</td>
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<td>Electives</td>
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Sophomores
A. For students with mathematics:

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B. For students with incomplete mathematics:

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<td>Mathematics 110 to be taken senior year</td>
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**Total** 16 16 16

**Junior**

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<td>German 1, 2, 3</td>
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**Total** 17 17 17

**Senior**

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<td>Chemistry 135, 191</td>
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<td>English 111</td>
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<td>Chemistry 198</td>
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<td>Electives, group requirements</td>
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**Total** 17 17 17

**Master of Science Degree in Chemistry**

The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical. Besides graduate courses (in the 200 series), courses 116, 124, 135, 155, 191 may be used towards the Master's degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's degree by other departments if the student's supervisory committee approves.

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

**Courses**

3, 4, 5. **Chemical Principles and Qualitative Analysis.** Introduction to chemical theory and principles of chemistry including introductory qualitative analysis. For science majors, pre-medical and pre-dental students, home economics majors in foods and nutrition. Prerequisites: two of the following high school courses: advanced algebra, chemistry, physics. (5F, 5W, 5S)

Maeser

10, 11. **General Chemistry.** Principles of inorganic chemistry. Open to any matriculated students. Prerequisite: One unit of high school or college algebra. (5F, 5W or 5W, 5S)

Lee

12. **Elementary Organic Chemistry.** An introduction to organic chemistry. This course is designed to follow Chemistry 11 and completes a one-year terminal course in chemistry (5S)

Lee

17, 18. **Quantitative Analysis.** Theory and laboratory practice of gravimetric and volumetric analysis. Prerequisites: Chem. 5, Math. 35. (5F, 5W)

Cannon
31, 32, 33. Physical Science. Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of all three quarters. (3F, 3W, 3S) Staff

101. Elementary Physical Chemistry for Biologists. A lecture survey of basic quantitative laws governing chemical processes, applied to examples of biological interest. Mathematical derivations are kept to a minimum. Recommended as a prerequisite for those interested in biological or medical research. Prerequisites: Chemistry 12 or Chem. 5; Math. 34 or equivalent (3S) Bauer

104, 105, 106. Physical Chemistry. Quantitative methods for solving problems in chemical thermodynamics, phase rule, electrochemistry, reaction kinetics, quantum theory, and molecular structure. Prerequisites: Chem. 5, 18; Physics 20, 21, 22; Math. 99. (3F, 3W, 3S) Tensmeyer

108. Dairy Chemistry. The chemistry of milk and milk products, including tests for adulterants, preservatives, and routine methods of quantitative analysis of dairy products. Taught alternate years. Prerequisites: Chem. 12 or equivalent and Chemistry 190. (Taught 1957-58 and alternate years.) (4W) Van Orden

109, 110, 111. Experimental Physical Chemistry. Laboratory work correlated with Chemistry 104, 105, 106. (1F, 1W, 1S) Tensmeyer

115. Quantitative Analysis, A Brief Course. Basic theory and laboratory practice of quantitative analysis. A course designed primarily for pre-medical and pre-dental majors. Prerequisites: Chemistry 5, Math. 35. (5S) Cannon

116. Inorganic Preparations. A laboratory course in practical methods of synthetic inorganic chemistry. Prerequisites: Chemistry 5, (5S) Lee

121, 122, 123. Organic Chemistry. Fundamentals of chemistry of carbon compounds. Terminal at the end of the second quarter for non-chemistry majors who desire ten hours credit. Prerequisites: Chemistry 5 or Chemistry 11. (5F, 5W, 5S) Larson

124. Organic Preparations. An advanced laboratory course in the synthesis of more complex compounds. Prerequisite: Chemistry 123. (3F) Larson

135. Chemical Literature. Exercises in finding, assembling and using information available in technical publications. (3S) Staff

155. Glass Blowing. A laboratory course in the technique of manufacturing and repairing pyrex brand laboratory glassware. (2W) Staff

160. Seminar. Time arranged. (1F, 1W, 1S) Staff

190. Elementary Biochemistry. The chemistry of carbohydrates, fats, proteins, enzymes, vitamins, hormones and minerals and their transformations in plants and animals. Prerequisite: Chemistry 12. Terminal course. Not considered to serve as prerequisite for Advanced Biochemistry. (5F) Van Orden

191. Fundamentals of Biochemistry. The chemistry of carbohydrates, fats, proteins, enzymes, vitamins, hormones and minerals and their transformations in plants and animals. Prerequisite: Chemistry 122. Prerequisite for Advanced Biochemistry. (5S) Van Orden

198. Undergraduate Research Problems. Any quarter. Time and credit arranged. Staff

215. Chemical Thermodynamics. Derivation of basic thermodynamic relations and application to selected physical-chemical problems. Prerequisites: Chem. 106; Math. 99. (5F) Bauer

225, 226, 227. Advanced Organic Chemistry. Modern theories and special topics in organic chemistry. (Taught 1956-57 and alternate years.) Prerequisites: Chemistry 106, 123. (3F, 3W, 3S) Larson

232. The Colloidal State and Surface Chemistry. Application of physical-chemical principles to surface phenomena. Fundamental properties and
theories of colloidally dispersed systems. Examples of colloidal behavior are selected from diverse fields. Prerequisites: Chemistry 106, 215; Math. 99. (SW)

234. Qualitative Organic Analysis. The classification, reactions and laboratory work involved in identification of unknown organic compounds. (Taught 1957-58 and alternate years) Prerequisites: Chemistry 18 and 123. (3S)

Bauer

250. Advanced Inorganic Chemistry. Based on the periodic table and atomic structure. Designed for chemistry seniors and graduates and others having similar training. Prerequisite: Chemistry 104. (Taught 1958-59 and alternate years.) (3S)

Lee

252. Chemical Forces and Molecular Structure. An interpretation of chemical and physical properties of matter in terms of electrostatic and electrodynamic forces between fundamental particles. Structural properties derived from X-ray crystallography are emphasized. (Taught 1957-58 and alternate years) Prerequisites: Chemistry 106, 215; Math. 99 (5S)

Bauer


Bauer

272. Optical Methods of Chemical Analysis. Problems in spectroscopy, spectrophotometry, colorimetry, refractometry and microscopy. Prerequisites: Chemistry 18, 106. (Taught 1957-58 and alternate years.) (3F)

Cannon

273. Electrochemical Methods of Analysis. Instruction in potentiometry, polarography, electro-analysis, and related methods as applied to analytical chemistry. (Taught 1957-58 and alternate years.) Prerequisite: Chemistry 18, 106. (3W)

Cannon


Cannon

289. Animal Metabolism. Feeding experiments involving development of amino acid, vitamin, mineral, and other nutritional deficiencies in animals. Chemical and biological tests made on rations, animal tissues, blood, urine, and other secretions and excretions when indicated. Time and credit arranged.

Greenwood

290. Toxicology. The effects of selected chemical compounds on living organisms. Prerequisites: Chemistry 191 or 190 and 122 (3)

Greenwood

291. Toxicology Laboratory. Qualitative and quantitative determinations of inorganic and organic poisons. Observations of symptoms which develop upon administration of poisons. To accompany Chemistry 290 (2)

Greenwood

292. Advanced Biochemistry. Biochemical Analysis. Problems in metabolism, micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisites: Chemistry 190 or 191. To accompany Chemistry 296. (2 or more credits, W)

Greenwood

293. Advanced Biochemistry. Biochemical Preparations. Preparation of enzymes and amino acids. Prerequisite: Chemistry 190 or 191. To accompany Chemistry 295. (2 or more credits, F)

Greenwood

294. Advanced Biochemistry. Biological Assays. Microbiological and colorimetric methods for determination of vitamins and amino acid in plant and animal tissues. Prerequisite: Chemistry 190 or 191; Bacteriology 70 or 71. To accompany Chemistry 297 (2 or more credits, S)

Greenwood

295. Advanced Biochemistry. Enzymes. Enzymes and their functions in plants and animals. Should be accompanied by Chemistry 293. (Taught 1957-58 and alternate years.) Prerequisite: Chemistry 191 or 190 and 122. (3F)

Van Orden

296. Advanced Biochemistry. Principles of Metabolism. Carbohydrates, fats and proteins and their metabolism in plants and animals. Should be accompanied by Chemistry 292. (Taught 1957-58 and alternate years) Prerequisites: Chemistry 190 or 191, Chemistry 122. (3W)

Van Orden
297. Advanced Biochemistry. Vitamins, vitamins and hormones and their functions in plants and animals. (Taught 1957-58 and alternate years.) Prerequisite: Chemistry 191 or Chemistry 199 and 122. (3S) Van Orden

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

Staff

ENGLISH AND JOURNALISM

King Hendricks, Professor and Head of Department; Carlton Culmsee, Hubert W. Smith, Ira N. Hayward, Moyle Q. Rice, M. L. Nielsen, Professors; Maxwell D. Edwards, Thornton Y. Booth, Associate Professors; John J. Stewart, Blair Hansen, J. Lynn Mortensen, J. Golden Taylor, Arthur H. Friesche, John M. Patrick, John M. Beyers, Assistant Professors; Veneta L. Nielsen, John S. Bullen, L. Grant Reese, Karl Klages, Instructors.

Wallace J. Vickers, Professor Emeritus.

ENGLISH

Major and Minor Requirements

Bachelor of Science Degree

English Major: A minimum of 15 credits in the lower division course work drawn from American, English, and World Literature; a minimum of 30 credits of upper division course work. Two years or 24 credits of a foreign language.

American Studies Major: The English department, in cooperation with the College of Business and Social Sciences, offers a major in American Studies. The requirements are as follows:

(1) A minimum of 36 credits in English, American, and World Literature, drawn from the following or other approved courses: 40, 41, 45, 53, 54, 58, 60, 61, 147, 150, 151, 154.

(2) A minimum of 16 credits in History, drawn from the following or other approved courses: History 13, 14, 156, 175. A minimum of 11 hours of Political Science, drawn from the following or other approved courses: Political Science 10, 117, 118, 119.

(3) A minimum of six credits from courses in the following areas: Economics, Sociology, Art, Music, and Education. The specific courses of these areas to be approved by the major professor.

(4) A minimum of two years of modern foreign language, French, German, or Spanish.

(Students with a major in American Studies will not be required to present a minor.)

English Teaching Major: An English teaching major in order to receive the recognition and the recommendation of the English department must present a minimum of 15 credits in the lower division course work drawn from American, English, and World Literature (not including courses submitted for fulfillment of the language arts requirement); and a minimum of 30 credits of upper division course work. All courses must have the approval of the head of the English department.

English-Speech Composite Major: A minimum of 35 credits of course work approved by the head of the English department. (See Speech department for speech requirement.)

Courses should be approved by the English advisers—Hendricks, freshmen and sophomores; Smith, juniors and seniors.

*On leave of absence.
English Teaching Minor: In order to obtain the recommendation of the English department, a teaching minor must present a minimum of 25 credits of English course credit; this credit must have the approval of the head of the English department.

Prospective majors and minors should consult with the head of the English department as early in their college career as possible.

Master of Arts Degree

A candidate for a Master of Arts degree must present a Bachelor's degree with English as a major or an equivalent. (To complete the degree the candidate must (1) take the Graduate Record Examination given by the Graduate School, (2) pass the English departmental examination, (3) complete forty-five credits in course work of which not more than 15 nor fewer than nine may be thesis credit and of which ten credits must be in courses numbered over 200, (4) present a statement of proficiency in the reading of one foreign language from the language department. (5) present an acceptable thesis, (6) pass successfully the final oral examination under the auspices of the Graduate School. (Some assistantships are available for students who qualify as master's candidates in the English department. Students interested in these assistantships should make formal application to the Head of the English department.)

Courses should be approved by the head of the department.

Lower Division

1, 2, 3. Basic Communication. Required of all freshmen. (3F, W, S) Before credit can be obtained for English I, the instructor must have received the Placement Test Scores. Staff

4. Elements of Grammar. Designed for students who wish training in grammar beyond that given in Basic Communication. (3F or W) Staff

5. Vocabulary. A study of word formation and derivation as a means of understanding scientific terms and of increasing vocabulary. (5F, W or S) Staff

12. Practice in Composition. Designed for students who wish practice in composition beyond that given in Basic Communication. (5F or W) Taylor

31. Floating Poetry. Poetry that has lived in oral tradition since medieval times. (5S) Hendricks

32. Readings in Poetry. To develop appreciation for poetry. Verse forms, various types of poems, and the idea underlying lasting poetry are considered. (5S) V. Nielsen Rice

33. Readings in Short Story. (3F, W or S) Rice

34. Great Books and Ideas. Man's ideas about himself, the universe, the divine. (3F) Rice

35. Great Books and Ideas. Man's ideas about social relationships. (3F) Rice

36. Great Books and Ideas. Man's ideas about the modern world. (3F) Rice

(The courses 34, 35, 36 are related but they are taught as independent units and need not be taken as a series.)

37. Reading in the Novel. (3F, W) Edwards

40. World Literature Before 1650. (5F, W or S) Staff

41. World Literature from 1660 to the Present. (5F, W or S) Staff

42. Readings in Mythology. (3S) Reese

45. Readings in Philosophical Literature. (5F) Hayward

46. The Bible as English Literature. (5S) Vickers

48. Modern European Literature. (3F) Staff
53. American Literature, Early Period. (5F, W or S) Staff
54. American Literature, Late Period. (5F, W or S) Staff
58. Modern American Literature. (3F) Smith; Taylor
60. English Literature, Early Period. (5F, W or S) Staff
61. English Literature, Late Period. (5F, W or S) Staff
68. Modern English Literature. (3W) Booth

Upper Division

104. Grammar. A course designed for teachers. (3S) Edwards
105. History of the English Language. (3W) Hendricks
110. Advanced Composition. For students who have taken English 10; may be taken in place of English 19 by students who have credit in English 17 and English 18 and who have transferred from Forestry or Engineering; may be taken by transfer students who have six credits in Composition. Emphasizes vocabulary, selection, and clear organization of information. (4F, W or S) Staff
111. Technical Writing. Emphasis upon bibliography, research methods and final form of the technical report. Open to juniors and seniors only. (3F, W or S) Frietzsche
112. Advanced Writing Problems. A practical course in special problems of writing, such as letters of application, summary abstracts, short reports, and informal articles; mainly for juniors and seniors in forestry or engineering who do not take 111. (3W or S) Frietzsche
117. Creative Writing
   a. Short Stories (3F) Rice
   b. Essays. (3W) Hayward
   c. Poetry. (3S) V. Nielsen
122. Children’s Literature. A study of the prose and poetry of children to the junior high school age. (3F or W) A. Smith
123. Literature for Adolescents. The prose and poetry of the high school age. (3S) A. Smith
124. The Teaching of English. See Education 124. (4S) Budge
134. Literary Criticism. Masterpieces of criticism from Plato and Aristotle to Croce. (4S) Culmsee; Edwards
142. European Literature of the Renaissance. (5W) M. L. Nielsen
147. Comparative Literature. The Eighteenth Century in France and England. (3F) Hendricks
148. Comparative Literature. The Romantic Period in England and Germany. (3W) Hendricks
149. Comparative Literature. The Nineteenth Century in England and Europe. (3S) Hendricks
150. American Poetry. From Philip Freneau to the Present. (3F) Hayward
151. American Fiction. Nineteenth and early Twentieth Century fiction writers. (3W) Smith
152. American Drama. Historical treatment of American drama; extensive reading of representative plays. (3S) Smith
154. Major American Authors. Intensive studies of the chief American novelists, poets, and essayists of the Nineteenth Century: a. Edgar Allen Poe; b. Ralph Waldo Emerson; c. Nathaniel Hawthorne; d. Herman Melville; e. Mark Twain; f. Henry James; g. Walt Whitman. These courses are taught when required. (2) Staff
162. Chaucer. (5F)
163. Shakespeare. Comedies and History Plays. (5W)
164. Shakespeare. The Tragedies. (5S)
165. Major English Authors. a. Donne; b. Johnson and Boswell; c. Shelley; d. Tennyson; e. Browning; f. Arnold. These courses are taught when required. (2)
168. Readings in World Drama. (5F)
169. Readings in World Drama. (5W)
170. Milton. (3S)
175. Literature of the English Renaissance. (5W)
180. Restoration and Eighteenth Century. (5F)
190. The Romantic Period. (5W)
191. The Victorian Period. (5S)
199. Readings and Conference. Time and credit arranged. Any quarter. Students must have the approval of the head of the department. (2)
200. Thesis. Time and credit arranged. (5F)
201. Bibliography and Methods. Required of all candidates for the master's degree. (5F)
209. Anglo-Saxon. Required of all candidates for the master's degree. (5S)
211. Bibliography and Research Methods. An intensive course in preparation of bibliography, use of source materials, and other problems of thesis writing. Open to graduate students only; recommended for first quarter of graduate study. (2F, W or S)
252. Seminar in American Literature. (3W)
261. Seminar in Middle English Literature. (4S)
280. Seminar in Eighteenth Century Literature. (3S)
290. Seminar in Nineteenth Century Literature. (3W)

JOURNALISM

Major students in Journalism should complete Journalism 1 through 6, 12, 13, 14, 16, 81, 91, 96, 112, 114, 115, 125, 156, or 164, 166; Photographic Journalism 51, 151; English 5, 10, 53, 110, 117a, b or c. They are urged to complete as many of the following as possible: Journalism 81, 182; English 40, 46, 60, 63, 105, 134. It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, English, History, Modern Languages, Political Science, Psychology, Sociology, Speech. See also Photographic Journalism.

Majors in Agricultural Journalism and Home Economics Journalism, designed to meet needs of individuals, are available.

1, 2, 3. College Journalism. For members of Student Life Staff. Discussions of newspaper and responsibilities of journalists. (1F, 1W, 1S)

4, 5, 6. College Journalism. Second year. (1F, 1W, 1S)

12. Introduction to Journalism. Lectures on the historical, social and vocational aspects of the various fields of journalism: newspaper, magazine, book, radio, television, motion picture, public relations, advertising, teaching; also, the psychology of news. (3F)
13. Reporting. A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12 (3W) Stewart


16. Copyreading. Primarily a laboratory course in handling newspaper copy, headline, page layouts. Prerequisite: Journalism 12, 13, 14. (3F) Stewart

81. Introduction to Radio and Television. (See Speech Department for description.) (3F) B. Hansen

82. Radio Speech. (See Speech Department for description.) (3W) B. Hansen

83. Elements of Broadcasting. (See Speech Department for description.) (3S) B. Hansen

91. Weekly Newspaper. Problems of editing and publishing weeklies. Efforts are made to provide laboratory experience in a weekly. (3W) Taught alternate years. Stewart

92. Weekly Paper Internship. Six weeks work in the summer on a weekly newspaper. Prerequisite: 91. (Arranged) Staff

96. Growth of Mass Media and Propaganda. Development of American publications and electronic means of disseminating information and propaganda; also main currents in thought conveyed by these media. (5S) Culmsee

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

114. Writing for Radio and TV. Study and practice in writing information and continuity for radio programs. (3W) Taught alternate years. Stewart

115. Law of the Press. Law of libel, right of privacy, contempt of court, copyright, and postal regulation. (2W) Taught alternate years. Culmsee

120. Journalistic Techniques. For non-journalism majors. Techniques which aid professional people, extension workers and others to use newspapers, magazines and radio for publicity and information purposes. (3F) Stewart

125. Editorial Page. A study of editorials and other elements of the modern editorial page, and the writing of editorials. (3F) Culmsee

156. Principles of Advertising. (See Merchandising Department, College of Business and Social Sciences, for description.) (5W) Calder

164. Publicity Methods. Media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: 12, 13, 14 or permission of instructor. (3S) Stewart

166. Journalism Practices. Laboratory work in publications or radio stations. (2F, 2W, 2S) Staff

182. Radio-TV Newscasting and Writing. Offered in both Speech and Journalism Departments. Study and application of principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5W) Taught alternate years. B. Hansen; Stewart


191. School Publications. Problems of advising staffs of school newspapers, yearbooks and magazines. (3S) Staff
LANDSCAPE ARCHITECTURE AND PLANNING

Laval S. Morris, Professor and Head of Department; Eric Defty, Associate Professor.

Landscape architecture is the arrangement of land and the objects upon it for use. All phases of training in this department are concerned with the use or function to which land is subjected for human need, and design is constantly centered on functionalism.

Required Courses

The following courses provide: (1) necessary instructional material directly concerned with Landscape Architecture and Planning. (2) Supporting courses listed in fields which are closely related, such as Civil Engineering, Art, Horticulture, and Botany. (3) Courses required in the various fields of Science and Art for liberal education.

Freshman

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<td>History and Lit. of Landscape Architecture, L. A. 30</td>
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<td>Algebra, Math. 34, 35</td>
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<td>Trigonometry, Math. 46</td>
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<td>General Botany, Botany 24, 30</td>
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<td>Eng. 1, 2, 3</td>
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Sophomore

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<td>Descriptive Geometry, C. E. 63</td>
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<td>Plane Surveying</td>
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<td>Civil Eng. 81, 82</td>
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<td>Engineering Drawing 94</td>
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<td>Sociology 70</td>
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<td>Soils, Agronomy 56</td>
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Junior

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<td>Design, L. A. 140, 141, 142</td>
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</tr>
<tr>
<td>Planting Design, L. A. 150, 151, 152</td>
<td>6</td>
</tr>
<tr>
<td>Recreational Planning, L. A. 130</td>
<td>2</td>
</tr>
<tr>
<td>City &amp; Regional Planning 170</td>
<td>3</td>
</tr>
<tr>
<td>Fundamentals of Speech 1</td>
<td>5</td>
</tr>
<tr>
<td>Art</td>
<td>6</td>
</tr>
<tr>
<td>Adv. Comp., Eng. 110</td>
<td>4</td>
</tr>
<tr>
<td>Economics 51, or Agr. Econ. 53</td>
<td>5</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Senior

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape Constr., 160, 161, 162</td>
<td>9</td>
</tr>
<tr>
<td>Advanced Planning and Design, L. A. 180, 181, 182</td>
<td>9</td>
</tr>
<tr>
<td>Sculpturing, Art 160</td>
<td>3</td>
</tr>
<tr>
<td>Landscape Architecture 190</td>
<td>6</td>
</tr>
<tr>
<td>Seminar 195</td>
<td>1</td>
</tr>
<tr>
<td>The Writing of Feature Articles, Journalism 112</td>
<td>3</td>
</tr>
<tr>
<td>Roads and Pavements</td>
<td>4</td>
</tr>
<tr>
<td>Civil Engineering 120</td>
<td>11</td>
</tr>
</tbody>
</table>

Course Description

3. Elements of Landscape Architecture and Planning. Relation of people to land regions and small areas. Principles of design and composition applied to various types of land planning. Design of home grounds is emphasized. Field trip required. (3F or S) Morris; Shiozawa

20. Landscape Architectural Graphics. Methods in instrumental drafting and perspectives, light and shade studies, architectural lettering, and general symbolic graphics necessary in the professional practice of landscape architecture. (3 FW)

30. History and Literature of Landscape Architecture. The history of landscape architecture and its relation to architecture and other allied arts. Present trends and future possibilities are emphasized. (5W) Morris
35. **Theory of Design.** Form in relation to vertical mass and horizontal space. Abstract design is studied, and the resultant forms transposed into concrete space and mass relationships. The chief purpose is to provide the student with an awareness of design as early in his training as possible. (3W)

40, 41. **Plant Materials.** The ecological, functional, and aesthetic uses of native and cultivated woody and herbaceous plants for landscape purposes. Prerequisites: Botany 24 and 30. (3F, 3W)

60, 61, 62. **Architectural Design.** The design, construction, and orientation of architectural structures as related to land areas. Prerequisites: L. A. 20 and 35. (2 FWS)

130. **Park and Recreational Planning.** Analysis and development procedures in national, state, and urban parks; forest lands; and private lands in terms of recreational and aesthetic values and uses. Field trip required. (2S)

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

140, 141, 142. **Landscape Design.** Introduction to the analysis and writing of design criteria and the design of private and public properties. Theoretical and actual site problems are used. Prerequisites: L. A. 62 and C. E. 82 (3FWS)

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

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

170. **City and Regional Planning.** An introduction to the scope and methods of city and regional planning. Legislative, administrative, and effectuation of the general interim plan. (3 W)

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

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. (Morris)

195. **Seminar.** Readings and reports on current topics and trends in Landscape Architecture. Required of senior students. (1 W)

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

**LIBERAL STUDIES**

**T. Y. Booth, Adviser**

The Department of Liberal Studies was organized to discharge two functions. One is to provide a program combining elements of both the humanities and the sciences and leading to a degree in liberal education. Considerable flexibility is afforded through choice among several curricula, but the goal is substantial, orderly, well-balanced mental development of a broad type. Eventual selection of a field of concentration in the general area of either the sciences or the humanities is required for a degree.

The second function of the department is the advisement of students who have not decided upon a major subject or area of specialization. The department head finds a suitable adviser for each of these students. With the aid of this adviser he looks after the student's academic interests until the
student has had an opportunity to explore his own aptitudes and also career opportunities sufficiently that he can choose an occupation. Advisers are selected from all colleges of the university on the basis of personality qualifications and student interests.

Students who are enrolled in other departments but who have satisfactory reasons to believe that they have chosen their major unwisely may, with the consent of the Office of Student Personnel, transfer to the Department of Liberal Studies.

**Curricula in Liberal Studies**

Several curricula, each leading to a bachelor's degree, are available in Liberal Studies. Each includes a balanced offering of courses drawn from several departments, so that both the humanities and the sciences contribute to the student's mental development and his view of man and the universe.

**Main Currents in Western Civilization.** The courses are selected principally from history, philosophy, literature and natural science. Two years of a foreign language are required.

**Language and World Literature.** The courses are selected principally from literature, philosophy and modern languages. Study of a foreign language in college for at least three years is required.

**Science and Philosophy.** The courses are selected principally from physical and biological sciences, history, literature and philosophy. Two years of a foreign language are required.

**MATHEMATICS**

Neville C. Hunsaker, Professor and Head of Department; V. H. Tingey, Professor; Mary Nelson, Joe Elich, Associate Professors; Wayne R. Rich, Robert G. Hammond, Assistant Professors.

Two types of majors are offered by the Mathematics Department. Students intending to enter graduate study in mathematics, those intending to teach mathematics in a Junior College or a University, and those expecting industrial employment as mathematicians take the regular major. Those intending to teach mathematics in high schools may elect to fill the requirements for a teaching major.

Regular majors are required to complete Mathematics 130, 131, 132 and fifteen additional credits of upper division mathematics. Those expecting to do graduate work should have a reading knowledge of French or German. Physics 20, 21 and 22 are required and 9 credits of upper division physics are recommended.

A departmental approved teaching major must include 9 credits of upper division mathematics. It is recommended that the teaching major include Mathematics 60, 119, 150 and 153.

A departmental approved teaching minor must include Mathematics 98 and 99 or 98, 60 and 150.

All students majoring in mathematics must have had Plane and Solid Geometry. Plane Geometry is a prerequisite for all college mathematics except Mathematics 20, 34, 35 and 60.

**Courses**

H.S. 42. Plane Geometry. (F or W, no credit)


33. Solid Geometry. (2S) Prerequisite: Math 34 or equivalent.

34. Introduction to College Algebra. Daily. (3F, W, S) Prerequisite: One year of high school algebra. It is recommended that students with more than one year of high school algebra register for Math 35.
35. College Algebra. (5F, W, S) Prerequisite: 34
41. Plane Trigonometry. (3F, W, S) Prerequisite: 35
46. Plane and Spherical Trigonometry. (5F, W, S) Prerequisite: 35
50. Descriptive Astronomy. (3SS)
60. Mathematics of Finance. (3S) Prerequisite: 35
97. Plane and Solid Analytical Geometry. (5F, W, S) Prerequisite: 44 or 46
98. Differential Calculus. (5F, W, S) Prerequisite: 97
99. Integral Calculus. (5F, W, S) Prerequisite: 98
110. Calculus and Differential Equations. (5F, W, S) Prerequisite: 99
116. Modern Algebra. (3S) Prerequisite: 99
119. Theory of Equations. (3W) Prerequisite: 99
120. Modern Geometry. (3—not offered 1957-58) Prerequisite: 99
122. Ordinary Differential Equations. (3F) Prerequisite: 99
123. Number Theory. (3—not offered 1957-58) Prerequisite: 99
124. Foundations of Mathematics. (3—not offered 1957-58) Prerequisite: 99
130. Advanced Calculus. (3F) Prerequisite: 110
131. Advanced Calculus. (3W) Prerequisite: 130
132. Advanced Calculus. (3S) Prerequisite: 131
145. Vector Analysis. (3W) Prerequisite: 99
150. The Teaching of Mathematics in the Secondary Schools. (3S)
153. Mathematical Readings. (3—not offered 1957-58) Prerequisite: 99
246. Tensor Analysis. (3—not offered 1957-58) Prerequisite: 145
254. Theory of Function. (3F) Prerequisite: 132
255. Theory of Functions. (3W) Prerequisite: 254
256. Theory of Functions. (3S) Prerequisite: 255
257. Advanced Applied Mathematics. (3—not offered 1957-58) Prerequisite: 132
258. Advanced Applied Mathematics. (3—not offered 1957-58) Prerequisite: 257
259. Advanced Applied Mathematics. (3—not offered 1957-58) Prerequisite: 258
260. Graduate Thesis. Time and credit arranged each quarter.

DIVISION OF STATISTICS

Degree: Bachelor of Science in Mathematical Statistics.

The work in Mathematical Statistics has a three-fold purpose:
(a) to train professional statisticians.
(b) to instruct students who wish to broaden their mathematical studies or who seek a mathematical background for studies in economics, sociology, genetics, biometry, psychology and education.
(c) to conduct research in statistics and train competent consultants on statistical problems.

Mathematics 99 or its equivalent is required of all students taking statistics in the Division of Statistics.

Students wishing to major or minor in statistics will take the course 160 to 167 inclusive in the Division of Statistics, and Mathematics 110, 130, 131 and 132.

160. Determinant and Matrix Theory. (3—not offered 1957-58)
161. Calculus of Probability. (5F) Prerequisite: 99
162. Mathematics of Statistics. (5W) Prerequisite: 99
163. Mathematics of Statistics. (5S) Prerequisite: 162
166. Sequential Analysis and Control of Quality of Output in Manufacturing. (3—not offered 1957-58)
167. Statistical Reading and Reports. (3—not offered 1957-58)

MODERN LANGUAGES AND LATIN

Marion L. Nielsen, Professor and Head of Department; George A. Meyer, Professor; Thelma Fogelberg, Aldyth Thain, Associate Professors; Gordon E. Porter, John M. Beyers, Assistant Professors.

Elementary language courses train the student in the basic grammatical structure of the foreign language and develop his ability to read the language. In addition emphasis is placed upon correct pronunciation, and one of the major objectives of the elementary work is to assist the student in acquiring the ability to speak the language.

No credit in a beginning language may be used toward graduation until at least 15 credits have been accumulated.

Major in a modern language:

French: The following courses are required: 1, 2, 3, 101, 102, 103, 105, 110, and 15 credits in courses numbered above 110.

German: Forty-five credits including courses 1, 2, 3, 101, 102, 103, 105, 125, 126, and twelve credits in other courses numbered above 105

Minor in a language: Twenty-four credits are required for a minor in a modern language or in Latin. Students will not be recommended by the department for a teaching minor in a language unless they have completed at least 24 credits of approved courses in that language.

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

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

French

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

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


102A. Intermediate French. (3F)

4, 5, 6. Intermediate French. (3F, 3W, 3S)

105. Advanced Composition and Conversation. (3W)

106, 107, 108. Selective Reading. Open to students who have completed French 102 or its equivalent. Readings and reports in various subjects, scientific literary. (1-2F, 1-2W, 1-2S)

109. French Short Story. Students of the French Conte as a literary form. Serves as an introduction to literary movements in France. Special emphasis on the 19th century. (3S)

110. French Phonetics. Principles of French pronunciation and their practical application. (3F)

112. 19th Century French Poetry. (3W)
115, 116, 117. French for Graduate Students. Short, basic course designed to give graduate students a reading knowledge of French as a help towards passing advanced degree language requirements. (3F, 3W, 3S) Staff

120. Comedies of Moliere. Moliere’s plays as social criticism. (3F) Meyer

121. French Classic Drama. Plays of Corneille and Racine. (3W) Staff

122, 123. Nineteenth Century French Drama. Romantic and Realistic Schools. (3W) (3S) Fogelberg

125, 126. Survey of French Literature. (3W) (3S) Thain

129, 130. French Literature of the 18th Century. Special emphasis on the Philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. (3F, 3W) Meyer

131. Comedies of Beaumarchais and Marivaux. (3S) Staff


German

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

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

101A. Intermediate German. Intensive. (5S) Staff

4, 5, 6. Intermediate German. (3F, 3W, 3S) Staff

105. Advanced Composition and Conversation. (3W) Staff

106, 107, 108. Selective Readings. Open to students who have completed German 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S) Staff

110, 111, 112. Scientific German. Reading of scientific texts. Reports. (2F, 2W, 2S) Open to students after completion of 101 or equivalent. Staff

120. Die deutsche Novelle im 19. Jahrhundert. Reading and discussion of representative stories by Hauff, Storm, Meyer, Keller and others (3F) Nielsen

121. Lessing—Plays and Biography. (3) Nielsen

122. Schiller—Poetry, Plays and Biography. (3S) Nielsen

123. Die deutsche Novelle im 20. Jahrhundert. Representative stories by Thomas Mann, Herman Hesse, Arthur Schnitzler and others. (3) Staff

125. Survey of German Literature. A survey of German literature from the earliest times to the Ag of Goethe and Schiller. (3W) Staff

130. Goethe’s Faust. Prerequisite: Two years of College German or equivalent. (3W) Staff

131. Goethe’s Prose. Werther, Dichtung und Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) Staff

133. German Drama of the Nineteenth Century. Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) Staff

150. Phonetics and conversation. Especially for returned missionaries and others who had experience with the language abroad. (3) Nielsen

153. Thomas Mann—Novels, Novellen and Essays. His life and philosophy. The course is conducted in English and readings are in translation. Either German or English credit is given. (3) Nielsen

Spanish

1A, 2A. Elementary Spanish. Intensive course. Two hours daily, (7W) Staff

1, 2, 3. Elementary Spanish. (5F, 5W, 5S) Fogelberg, Porter

4, 5, 6. Intermediate Spanish. (3F, 3W, 3S) Porter


105. Advanced Composition and Conversation. (3) Fogelberg
Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various subjects, scientific or literary. (1-2F, 1-2W, 1-2S)

Survey of Spanish Literature.

Greek

Elementary Greek. (5F, 5W, 5S)

Latin

Emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of English. Recommended for English majors and for pre-law and pre-medical students. Includes readings from Caesar. (5F, 5W, 5S)

Vergil and Cicero. Readings from the orations of Cicero and Vergil’s Aeneid. Miscellaneous readings from other Roman authors. Open to students who have had one year of college Latin or two years of high school Latin. (3F, 3W, 3S)

Selective Readings in Latin. (2F, 2W, 2S)

Philosophy

Students registering for the courses in Philosophy listed below should already have completed ten credits in related subjects in the Humanities. (Literature, History, Political Science, Sociology).

Early Philosophers. The major philosophers of the Early Period. (3F)

Philosophers of Middle Period. The major philosophers of the Middle Period. (3W)

Modern Philosophy. The major philosophers of the Modern Period. (3S)

Portuguese

Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5F, 5W, 5S)

Second Year of Portuguese. Grammar, reading, conversation composition. Credit arranged. (F, W, S)

Selective Readings. One or two credits. (1-2F, 1-2W, 1-2S)

Russian

Courses for Foreign Students Taught by the Modern Language Department

English Phonetics for Foreign Students. To train foreign students in the sounds of English, and to increase their ability to speak with the rhythm and intonation of American English. May be taken in conjunction with M. L. 31. (3) Meyer

English for Foreign Students. Structure of the language, with exercises and drills for increasing comprehension and ability to write accurately. It is required of all foreign students who have failed to make required scores on English proficiency examinations on entering college. It may be used as an elective by others. (3) Meyer

English for Foreign Students. Advanced Grammar. (3) Meyer
UNIVERSITY COLLEGE

PHYSICS

John K. Wood, Professor and Acting Head of Department; Jay O. Jensen, Jack E. Chatelain, Robert L. Berger, Assistant Professors.

Requirements for Physics Majors: 45 credits, of which 30 credits must be upper division courses. Certain approved courses in upper division Engineering, not to exceed 10 credits, may be counted.

Suggested courses: The following sequence of courses is recommended for students who wish to continue in graduate study in physics.

Freshman Year: Mathematics 35, 46, 97; Chemistry 3, 4, 5; English 1, 2, 3. Group Electives.

Sophomore Year: Physics 20, 21, 22; Math. 98, 99, 100; German or French, or group electives.

Junior Year: Physics 120, 121, 130, Physics 175, 176, 177; (or Physics 153, 154) Math. 122, 145; Group Electives.

Senior Year: Physics 153, 154 (or Physics 175, 176, 177) 185, 186, 187, 193, 194, 195; one other year course in Physics; Math. 130, 131, 132; Chem. 104, 105, 106. Language group electives.

Minor in Physics is approved only for students majoring in closely related subjects. Such students must complete Physics 20, 21, 22, and at least 9 credits of upper division work. Physics 120, 121 and 130 are recommended for a teaching minor. Required professional education courses for the teaching certificate are listed by the College of Education.

Master of Science Degree in Physics

Candidates for the degree of Master of Science in Physics must present general physics, general chemistry, calculus, one additional year of mathematics and upper division courses in five of the following areas: Mechanics, Heat and Thermodynamics, Geometrical and Physical Optics, Electricity and Magnetism, Modern and Nuclear Physics, Meteorology, Physical Chemistry, Electronics, Sound. If the candidate has fewer than six credits in certain of these five fields, he may be requested to take additional work in those areas as part of the work for the Master's degree.

Courses

3. Introductory Physics. A non-technical course for students who do not expect to major in sciences but who want understanding of fundamental physical principles and applications. (5F, W or S) Jensen

6. 7. General Physics. Physics 6 covers mechanics, constitution of matter, heat, and meteorology. Physics 7 emphasizes electricity and magnetism, with a survey of light and sound. Primarily designed for students in Forestry and Agriculture. (Physics 6, 5 credits F or W; Physics 7, 5 credits S) Jensen

16. Introductory Meteorology. A non-mathematical treatment of physical laws governing the atmosphere and its phenomena. Brief study of the polar-front theory, air-mass analysis, weather map reading, forecasting, and information required by the Civil Aeronautics Administration for flying. (3F) Jensen

17, 18, 19. Mechanics. Electricity and Magnetism. Heat, Sound and Light. For Pre-Medical, Pre-Dental, Agriculture and Technology Majors. Prerequisite: Math. 44 or 46. Should be taken in sophomore year, and in the sequence indicated, except with permission of instructor. Three lectures, two labs. and two quiz periods per week. (5F, 5W, 5S) Jensen

20, 21, 22. Mechanics. Electricity and Magnetism. Heat, Sound and Light. For Science majors and Engineers. Prerequisite: Math. 97 or approval of instructor. Concurrent or previous registration for calculus desirable. To be taken in sequence except with permission of instructor. Should be taken
in the sophomore year. Two lectures, two labs and three quiz sections per week. (5F, 5W, 5S) Staff

31, 32, 33. Physical Science. Principles essential to understanding the physical universe. Elements of astronomy, chemistry, geology, mathematics, and physics integrated for use in interpreting human experience. Intended to meet the physical science group requirements upon completion of three quarters' work. (3F, 3W, 3S) Staff

Upper Division

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken in Junior year.

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

117. General Meteorology. (Physics of the Air.) Atmosphere physics and weather phenomena using both dynamic and synoptic procedures. Brief study of meterological apparatus, observations, map reading, forecasting, and basic principles of aeronautical meterology. Prerequisite: Physics 19 or 22 and Calculus. Four lectures, one lab. (5S) Jensen

120, 121. Modern Physics. (Recommended for juniors.) A study of electrons, ions, atomic structure and radiation. (3F, 3W) Staff

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

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


160, 161, 162. Heat; Thermodynamics; Kinetic Theory. (3F, 3W, 3S) Staff


182. Electronics. Emphasis on design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. Three lectures, one lab. (4 Arr.) Not taught 1957-58.

185, 186, 187. Physical Measurements. A laboratory course to give the advanced student experience with precision measuring instruments and their use in physics. Measurements in electricity and magnetism, heat, optics and spectroscopy, atomic and nuclear physics. Recommended for seniors. (2F, 2W, 2S) Staff

193, 194, 195. Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in physics. Students receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for this course or not. (1F, 1W, 1S) Staff

196, 197, 198. Selected Reading in Physics. (1F, 1W, 1S) Staff

Graduate Courses

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

214. Soil Physics. (See Agronomy 214.)


250. Research in Physics. Credit to be arranged before registration. (F, W, S) Staff


290, 291, 292. Theoretical Physics. (3F, 3W, 3S) Taught 1957-58. Staff

293, 294, 295. Seminar in Physics. (1F, 1W, 1S) Staff

Upon sufficient demand other courses may be offered.

SPEECH

Chester J. Meyers, Professor and Head of Department; Rex E. Robinson, Professor; Burrell F. Hansen, Associate Professor; Gwendella Thornley, Parley W. Newman, Assistant Professors.

The Department of Speech offers training in interpretation, public address, broadcasting, and speech pathology.

The requirements of 45 credits for a departmental major or a teaching major in Speech are as follows: Public Speaking, 8 credits (Speech 125 required of all majors); Interpretation, 8 credits (Speech 124 required of all majors); Drama, 8 credits. F.A.D. 30 and 50 required of all majors; Speech Correction, 8 credits (Speech 167 required of all majors); Radio, 6 credits (Speech 181 required of all majors); elective courses in Speech, 10 credits. In addition, courses in Dramatic Literature, 5 credits and Teaching of Speech, 2 credits, are to be recommended by the Department Head according to student needs.

English courses 163, 168 may be used for credit toward the department requirement in dramatic literature.

Students emphasizing speech correction and desiring to comply with minimum standards for certification must satisfactorily complete the following speech courses: 7, 111, 167, 169, 171, 173, 175, 177, 179. An additional 14 quarter hours in psychology is required including Child Psychology (or Child Development); Mental Hygiene, and Psychology of the exceptional child.

For the Composite English-Speech Major, students are required to have the following speech courses: Public Speaking, 8 credits; Interpretation, 8 credits; Drama, 8 credits; Speech Correction, 5 credits; Radio, 3 credits; Teaching of Speech, 2 credits. For a distribution of these courses see second paragraph above. For English courses needed for the English-Speech composite major see writeup for English Department.

For the Composite Speech-Drama major, students are required to have the following speech courses: Public Speaking, 8 credits; Interpretation, 8 credits; Speech Correction, 5 credits; Radio, 3 credits; Teaching of Speech, 2 credits; Elective speech courses, 8 credits. For a distribution of these courses see second paragraph above. For Drama courses need for the Speech-Drama composite major see writeup for Fine Arts Department: Drama.

Master of Science Degree

The Department of Speech offers opportunity for research and study leading to a Master of Science degree in the following fields: Interpretation, public address and broadcasting.

The following courses may be used for graduate credit by students majoring in the Speech Department or by students in other departments: 110, 111, 123, 124, 125, 171, 173, 181, 182, 184, 185, 186, 190.
Courses

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

3. Practice in Speaking. For students whose experience in Basic Communications or previous speech classes has indicated they have definite deficiencies in such areas as adjustment to the audience situation, bodily action, varied and vigorous use of voice, oral reading, oral grammar, and other aspects of speech delivery. Admission by consent of instructor only. (3F, W or S) Does not fill group requirements. Thornley

4. Principles of Reading. Effective oral and silent reading of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes both standard literature and everyday reading matter. (5F, W or S) Thornley

7. Voice and Phonetics. This course is designed to analyze speech with regard to the acoustical, anatomical and phonetic components of which it is composed. Taught alternate years. (3W) Newman

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

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

21. Intermediate Public Speaking. (Formerly Advanced Public Speaking) Students work with types of speaking most interesting and useful to them, and determine length of speeches and times to speak, within the framework of certain minimum requirements. Emphasis on developing skill in speech presentation. Prerequisite: Speech 1 or 5 or Basic Communications 1, 2 and 3. (3F, W or S) Myers

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

75. Remedial Speech. For persons who have a noticeable difficulty with speech, in articulation, quality, pitch, intensity, stuttering, or rhythm. Time and credit arranged. Consult instructor before registering. May be taken more than one quarter. Newman

81. Introduction to Radio and Television. Radio and TV station and network organization, operations, and programming. Attention given to developing an understanding of radio and TV as factors in social organization, and to developing appreciation in selection of programs. (3F) Hansen

82. Radio-TV Speech. Analysis and development of speech skills and speech forms used in radio and TV. Development of acceptable standards of voice and articulation for broadcasting. Includes exercises in presentation of announcements, talks, program continuities, interviews and roundtables. (3S) Hansen

83. Elements of Broadcasting. The various aspects of broadcast programs with practice in each. Writing and production of commercial continuity, news, musical programs, and dramas are carried out. (3W) Hansen

84. Studio and Control Room Operations. Basic studio and control room operations carried out by the announcer in radio stations. Information is basic for radio producers, announcers, and educators who use radio. 1 hour lecture and 2 hours of lab. per week. (2F) Hansen
105. Technical and Professional Speaking. Meets specific needs of technically trained and professional people in the practice of their professions. Speaking experiences parallel those encountered in career situations. Prerequisite: Speech 1 or Basic Communications 1, 2 and 3. (3F, W or S) Staff

107s. Speech Hygiene. (3) Newman

109. Public Discussion. Application of various group discussions techniques to current problems. Efforts are made to have some discussions presented to various civic and religious organizations, or to release them over a commercial radio station. (3S) Robinson

110. Play Reading. Attention given to cutting and building for public programs. Taught alternate years. (3W) Myers

111. The Psychology and Semantics of Speech. Principles of psychology which underlie speech. An insight into the processes of symbol use is attempted to bring about a more effective communication function. Taught alternate years. (3W) Newman

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

113. Argumentation. For the student desiring a background of information and practice in techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. (3F) Robinson

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

115. Intercollegiate Debating. Members of debating squads may receive not more than three credits in any one year. (3F, W or S) Robinson


123. Teaching of Speech. (Education 123) Methods and problems peculiar to the teaching of speech; organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2S) Myers

124. Advanced Interpretation. The mastering of significant selections from great writers. Reading from manuscript and from memory. (5S) Myers

125. Speech Composition. Advanced theory and practice of public speaking. Students build and deliver several short speeches and read selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore standing, and Speech 1, 5, or Basic Communications. (5W) Robinson

167. Introduction to Speech Correction. Factors conducive to normal and abnormal speech development in the child. Special attention to problems of articulation disorders and stuttering. Recommended for prospective elementary school teachers. (5F) Newman

169. Speech Pathology I. Functional and organic voice defects are studied. Cleft palate speech problems are considered. Some attention is given to the acquisition of substitute voice such as esophageal speech. Supervised experience in actual case work. Prerequisite: Speech 167. Taught alternate years. (5W) Newman

171. Speech Pathology II. Lectures and practicum in speech problems due to lesions of the nervous system such as Cerebral Palsy, Aphasia and dysarthrias. Supervised case work. Prerequisite: Sp. 167. Taught alternate years. (5S) Newman


179. Speech Science. Lectures and readings in pertinent research studies that have contributed to the field of speech. Taught alternate years. (3S) Newman

181. Radio Production. Study and studio practice in problems in directing and producing various kinds of broadcasts. Planning programs, casting and rehearsal procedures, co-ordination of technical aspects of production, and problems in special studio effects are considered. Registration limited to Juniors and Seniors. (3W) B. Hansen

182. Radio Newscasting and Writing. Gives credit in both Speech and Journalism departments. Principles of editing, organizing, writing and presenting news by radio and TV. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5W) Stewart; B. Hansen

184. Educational Broadcasting. Study and practice in the preparation and broadcasting of educational programs for children and adults. Designed to acquaint teachers, extension agents, civic workers, and others engaged in public informational activities with the broadcast services. Taught alternate years. (3W) B. Hansen

185. Advanced Radio-TV Production. Follows 181 and deals with more specialized production problems such as remote pick-ups, integration of recorded with live material, network and local studio co-ordination, documentary production, dramatic problems and special events. Prerequisite: Speech 181. (3W) B. Hansen

186. Radio and Television Training. Enrollment limited to students qualified by training and ability for actual broadcasting experience in a station. Students register for from 3 to 5 credits. They serve an apprenticeship under direction of the station staff in executing duties expected of a regular staff employee. Students render three hours service per week broadcasting for each registered hour of credit. (Time and credit arranged.) (F, W, S) B. Hansen

190. Problems in Speech. Especially selected work, individually assigned, handled and directed in consultation with the student. Special speech problems of mutual interest to students and instructors are investigated and reported upon in this course. Consult instructor for permission to register. Any quarter. Credit and time arranged.

Graduate Courses


201. Thesis. Prerequisite: Graduate standing. (2-5F, W or S) Staff

207. Experimental Methods in Audiology. Lecture and laboratory periods in basic concepts of psychophysics and psychophysiology of the ear. Prerequisites: Graduate standing and some background in elementary statistics. (3S) Newman

208. Experimental Phonetics. Principles and techniques in scientific analysis of speech and voice. (3W) Newman

290. Research Studies. Advanced research in Speech and Drama. By permission of instructors. Any quarter. Credit arranged. Staff

For a major in Zoology the following courses must be taken: Zoology 3, 4, 101, 107, 112, 116 or Entomology 115, 118 or 119; 127 or 128, 131; Entomology 13, and Physiology 121, 122. Also the following courses are recommended: Mathematics 34, 35, 44; Agronomy 131, 132; Chemistry 3, 4, 5, 121, 122; Physics 17, 18, 19; Botany 24, 25; Bacteriology 70, 71; Wildlife 160; Geology 3, 4. For students planning graduate work leading toward the Ph.D. degree, study of foreign languages is recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction, School of Humanities and Sciences, must be completed, and in addition the following courses must be taken: Zoology 107, 119, 127 or 128, 131, 116 or Entomology 115.

Master of Science Degree

The Zoology, Entomology, and Physiology Department offers courses leading toward the Master of Science degree in various phases of agricultural entomology, genetics, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

Doctor of Philosophy Degree

Cooperatively with related departments, advanced study and research is offered for the attainment of the degree of Doctor of Philosophy in specialized fields of zoology and entomology. Detailed information may be obtained from the department or from the Dean of the Graduate School.

ZOOLOGY

1. Principles of Biology. See Biology I under Integrated Courses.

3. General Zoology. An introduction to the principles of zoology, including consideration of the organization and functioning of animals, variety of animal life, ecology, reproduction, inheritance and evolution. Three lectures, two labs. (5F, W, S) Staff

4. Vertebrate Zoology. A study of the vertebrates with emphasis on structure, function, evolutionary relationships and some consideration of natural history. (5W or S) Prerequisite: Zool. 3 or equivalent. Staff

101. Invertebrate Zoology. The more important phyla of invertebrates, with some consideration of the local fauna. Prerequisite: Zool. 3. Three lectures, two labs. (5S) Staff

107. History and Literature of Biology. The more important men and ideas in the historical development of biology and the methods of finding references. (4F) Gardner

111. Human Genetics. Inheritance of human, physical and mental characteristics and associated problems. Prerequisite: A course in zoology or physiology. (3S) Gardner

112. Principles of Genetics. A technical course in the basic principles of heredity and variation. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (5F', W, or S) Gardner

113. Human Genetics. Inheritance of human, physical and mental characteristics and associated problems. Prerequisite: A course in zoology or physiology. (3S) Gardner
116. Parasitology. Protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Prerequisite: Zool. 3. Three lectures, two labs. (5S) Bahler

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5W) Hammond

119. Comparative Anatomy. Fundamentals of structure of the main types of vertebrates are studied comparatively. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5S) Hammond

121. Ornithology. Bird study planned to acquaint students with native birds and the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution are studied in classroom, laboratory, and field. Two lectures, two labs. (4S) Linford

122. Mammalogy. Introduces students to Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance are stressed. Two lectures, two labs. (4W) Gunnell

123. Natural History of Animals. Identification, habits, food, distribution and other features of common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Laboratory time is spent in making observations and collections in the field. Prerequisite: One or more courses in Zoology. Two lectures, two labs. (4F) Linford

127. Cytology. Study of cells, with emphasis on chromosomes and their behavior. Two lectures, two labs. (4W) Gardner

128. Elements of Histology. Study of tissues, including characteristics of different kinds of tissues and the main organs. Three lectures, two labs. (5F) Bahler

129. Histological Technique. Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3S) Bahler

131. Organic Evolution. Critical study of the facts and theories pertaining to evolution. Prerequisite: One basic course, in biological science. Zool. 111 or 112 recommended. (3W) Gardner

150. Herpetology. Classification, distribution, life habits, and identification of amphibians and reptiles, with emphasis on the local forms. Prerequisite: Zool. 4. Two lectures, two labs. (4F) Gunnell


201. Special Problems. Individual study of a problem under the guidance of a staff member. Credit arranged. (F, W or S) Staff

214. Advanced Genetics. Intensive study of problems of inheritance, with special consideration given to recent and current research. Prerequisite: Zool. 112. (3S) Gardner

235. Protozoology. The protozoa with emphasis on methods of study, especially procedures used in research on parasitic protozoa. One lecture, one lab. (2F) Hammond

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S) Staff

221, 222, 223. Seminar. Attendance required of all graduate students in department during each quarter in residence. Problems relating to research in general or to current researches in zoological science are discussed by faculty, graduate students, and advanced undergraduates. (1F, 1W, 1S) Staff
For a major in Entomology, the following courses are required: Zoology 3, 4, 107, 111 or 112, 131; Entomology 13, 103, 104, 108, 111, 115; Botany 24, 25, 130; Chemistry 3, 4, 5, 121, 122 (or 10, 11, 12); Mathematics 35; Physics 6, 7; Wildlife Management 160. The following courses are recommended: Entomology 120, 133, 230; Agricultural Economics 53; Botany 30; Agronomy 131, 132 and one other course. Horticulture 131 and one other course; Foreign language, two or more courses.

Courses required for a major in Agricultural Entomology: Zoology 3, 4, 112, 131; Entomology 13, 103, 104, 108, 120, 230; Botany 24, 25, 130; Mathematics 35; Chemistry 3, 4, 5, 121, 122 (or 10, 11, 12); Physics 6, 7; Agronomy 118; Agricultural Economics 53, 58; Horticulture 131 and 6 additional credits.


21. Social Life of Honey Bees. Honey bees are among the most highly developed animals with respect to social organization. Factors in this social organization are studied, including communication and physiology. The elements of beekeeping are also considered, including practice in handling bee colonies. Two lectures, taught alternate years. (2S)  

102. Systematic Entomology. Study of the classification of insects to orders. Collection of 400 specimens, 125 species and 15 orders required. Majors in entomology take Entomology 103 instead of this course. Prerequisite: Entomology 13 or 108. Three labs. (3S)  

103. Morphology and Taxonomy of Insects. A study of the external structures of insects and how they are used in classification. Collection of at least 600 specimens, 200 species, 90 families and 18 orders required. Prerequisite: Entomology 13. Two lectures, two labs. and field collecting. (5F)  

104. Advanced Systematic Entomology. A study of the principles of classification and the rules of zoological nomenclature. Practice is given in the preparation of keys, description of species, and scientific illustration. Prerequisite: Entomology 103. One lecture, two labs. (3W)  

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. Two lectures, two labs. (4F)  

108. Agricultural Entomology. Insect pests of major economic importance to agriculture, including their recognition, type of damage done, distribution, life history, and methods of control. Three lectures, two labs. (5F)  

111. Anatomy and Physiology of Insects. Comparative study of internal structure with considerable attention given to function. Prerequisite: Ent. 103. Two lectures, 2 labs. (4W)  

115. Medical and Veterinary Entomology. Arthropods are studied that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease receive major attention. Prerequisite: Zool. 3 or equivalent. Two lecture, two labs. (4W)  

120. Insect Pollination in Relation to Agriculture. Pollinating insects in agriculture, including beekeeping as related to crop pollination, utilization of native pollinating insects, and special problems in the pollination of many commercial crops. Taught alternate years. (2W) Not offered 1957-58.  

138. Aquatic Entomology. Identification, distribution, life histories and adaptations of aquatic insects are studied with particular reference to local streams and lakes. Two lectures, one lab. (3S)
210. Special Problems. Individual study of a problem under guidance of a staff member. Prerequisite: Ent. 13, 103 and 108. Credit arranged. (F, W or S) Staff

220. Insects in Relation to Plant Diseases. A study of insect vectors of plant diseases, including modes of transmission, nature of the pathogens and interrelationships of the pathogen, insect and host plant. Prerequisite: Entomology 108 or Botany 130. Taught alternate years. Two lectures, one lab. (3W) Not offered 1957-58. Davis

231. Biological Control of Insect Pests. Study of invertebrate parasites and predators of insects. Consideration is also given to diseases of insects, vertebrate predators, and destruction of undesirable plants by insects. Prerequisite: Entomology 13 or 108. Two lectures, one lab. Davis

233. Aphidology. Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 103. (3W) Taught alternate years. Staff

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

PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 121, 122, 123; Zoology 3, 4, 107, 112, 118, 119, 128 and 131; Biochemistry 191. Also Mathematics 34, 35 and 44; Physics 17, 18, 19; Chemistry 3, 4, 5, 115, 121, 122; Bacteriology 70, 71; and at least one year of a foreign language are recommended.

4. Human Physiology. For the student who desires a survey of physiology but who is not planning advanced intensive study. It deals with the functioning of the human body with emphasis upon broad general biological principles. Four lectures, one lab. (5F, W or S) Staff

20. Human Anatomy. Structure of the main human body systems with emphasis on the muscular, skeletal and nervous systems. For students desiring a more thorough study of human anatomy than is given in Physiology 4. Prerequisite: Physiology 4. Two lectures, one lab. (3F) Linford

120. Physiology. The functioning of mammals, with emphasis on muscular, nervous, and circulatory systems of man. Prerequisite: Physiology 4 or Zoology 3 and 4. Three lectures, two labs. (5S) Staff

121, 122. Mammalian Physiology. An intensive and detailed two-quarter course in physiology in which the function of each of the organ systems of man and animals is studied. Students may not register for 122 without having had 121. As preparation, Physiol. 4, Zool. 2, 3 or 4, or Vet. Sci. 20, and courses in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) Staff

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

131. Comparative Physiology. A comparative study of the physiological functions, primarily of the vertebrates. Prerequisite: Physiology 4. Two lectures, one lab. (3S) Staff

200. Special Problems. Special investigations in physiology are carried out in this laboratory course. For students who have taken Physiol. 121, 122 or who have been granted special permission. (2-5F, W or S) Staff

241. Methods of Endocrine Research. Methods used in studying the endocrine glands. Prerequisite: Physiol. 123. (3F) Staff

260. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. Staff
General Information

Utah State University is one of the Land-Grant Colleges established in the United States under the Morrill Act of 1862. All qualified male students are required to complete at least two years ROTC training. Students who are physically disqualified for military service, veterans, and students who transfer to Utah State University and hold junior or senior class rank may be exempt from this requirement.

Two separate ROTC units are located on the campus, Army ROTC and Air Force ROTC. Students may choose which unit they desire to enter to fulfill their ROTC requirements. Young men having an interest in aviation and desire to fly high performance aircraft are encouraged to enter the Air Force ROTC. Those who are interested in the diversified fields of the Army, including Army Aviation and U.S. Paratroopers should enroll in the Army ROTC course. Both programs provide excellent opportunity for development of leadership and organizational ability. Students may initially choose which program they wish to enter, subsequent transfer between units is not generally approved because of the difference in curriculum.

Both the Army and Air Force ROTC consist of two phases. The basic phase is normally taken during a student's freshman and sophomore years, and is a requirement for graduation of all qualified lower division male students. It consists of six quarters of work, including drill periods during fall and spring quarters. Unless exempt from this training, a student must obtain a passing grade for each quarter of work in order to become eligible for graduation. (See summary of requirements for graduation in the front of the catalog.)

The advanced phase of the ROTC course is normally taken during the junior and senior years and consists of six quarters of work plus a summer camp (to be taken between the junior and senior years). The advanced phase is both elective and selective. It is not a requirement for graduation, but once begun becomes a requirement unless a proper release is obtained. Students are selected for reenrollment in the advanced phase by boards composed of military and civilian faculty members. Selection is based on academic standing, leadership ability, officer potential and interest in the military. Satisfactory completion of the basic phase is normally a prerequisite for entrance into the advanced phase.

Satisfactory completion of both the basic and advanced phase, including the summer camp, leads to a commission as a second lieutenant in the Army or Air Force Reserve. Outstanding students in both programs are designated Distinguished Military Students and are afforded the opportunity of applying for commissions in the Regular Service.

Deferment from the draft is offered to all students who maintain satisfactory grades in their academic subjects and in ROTC. Upon completing the program, and being commissioned, students normally enter on active duty.
with the Armed Forces as second lieutenants in the service in which they were commissioned. The period of active service required of ROTC graduates depends on the requirements of the service concerned.

Enrollment Regulations

Two years, or six credit hours, of Army or Air Force ROTC is required for graduation of all qualified male students. Exemptions from ROTC training (i.e. evidence of veteran status, physical disqualifications, etc.) must be presented at time of registration. Students who are required to complete the basic ROTC course must repeat failed work until a passing grade is received. Responsibility for completion of this requirement rests with the student. A student who fails to register or appear for ROTC classes, may, at the discretion of the President, be excluded from all classes.

The advanced ROTC course is elective, but once begun becomes a requirement for graduation unless a proper release is obtained. Only selected students may enroll in the advanced phase.

ROTC drill periods are an integral part of the ROTC program. Registration for one of the drill periods offered is required of all ROTC students. ROTC Band students drill separately under the supervision of the college director of bands.

A combination uniform deposit and laboratory fee is required of all ROTC students. An amount of $5.00 is paid at the time of initial enrollment each year. Of this sum, a portion is returned to the student at the end of Spring Quarter or when the student drops from school.

General Requirements for Enrollment

A. Basic phase:
1. Be a citizen of the United States.
2. Not less than 14 years of age.
3. Physically qualified for military service.

B. Advanced Phase:
1. Satisfactorily complete the basic phase, or have equivalent credit.
2. Have high moral character. (Conviction by a civil or military court, other than minor traffic violations, must be waived before formal enrollment is accepted.)
3. Be able to complete the program and qualify for appointment as a Second Lieutenant before reaching 28th birthday.
4. Accept and sign a draft deferment agreement and agree to the stipulations of the advanced course contract. (A contract outlining the obligations of both the student and the service.)
5. Obtain a satisfactory score in the Air Force Officer Qualification Test battery or Army Qualification Test for Army ROTC. (The tests are usually administered to sophomore students during Fall and Winter Quarter.)
6. Be selected to enrollment into the advanced phase by a selection board composed of officers and civilian faculty members. (Selection is based on academic standing, previous military or air science grades, score in the tests, moral character, leadership and officer potential.)
7. Have at least two years of college remaining before becoming eligible for a degree. (It is desired that all students complete the ROTC course and the requirements for a degree simultaneously.)
8. Transfer membership in any reserve organization of the Armed Forces to the respective ROTC service. (Staff personnel of the department will assist students as necessary.)
Army ROTC

Colonel Asa C. Black
Professor of Military Science and Tactics

Major Lewis A. Civille, Infantry; Major Charles R. Clark, Corps of Engineers; Major Charles F. McCormick, Quartermaster Corps; Captain Ross F. Mayfield, Armor; Captain Morris C. Durham, Ordnance; 1st Lt. Derald T. Tilley, Quartermaster, Assistant Professors; Master Sergeant Harvey J. Holcomb, Infantry; Master Sergeant Edwin C. Pipes, Corps of Engineers.

The mission and purpose of the Army ROTC program is to prepare young men to serve as officers in the Reserve and Regular components of the Army. A General Military Science program is offered with instruction given in common subjects to provide general background knowledge essential in all branches of the service. Development of character, leadership, and citizenship is stressed. The student is provided with an understanding of the missions and responsibilities of the United States Army as a member of the National Defense Team; to include familiarization with major problems confronting the Army in this role; and to emphasize his personal responsibility as a citizen and leader.

A major in Military Science and Tactics is offered by the Army ROTC department. This major is intended to serve two categories: service personnel stationed at nearby military installations who desire to complete a degree while in the service; college students interested in the possibility of making a career of the service. Students electing this major are required to complete a dual major, the purpose of which is to assure adequate preparation for the future in event they are not selected or cannot qualify for a reserve commission. In this regard it is not possible to qualify for a major in Military Science if the student is not selected for Advanced ROTC. All majors at this institution are acceptable as a dual major but the following are particularly recommended: Engineering, Physics, Chemistry, Mathematics, Political Science, or Psychology. A freshman student electing Military Science as a major is advised to pursue one of the above fields. In addition, the student should concentrate on filling lower division group requirements including required basic ROTC courses and strive for a high grade point average.

Curriculum includes: A brief presentation of National defense policy and worldwide commitments that require support of the Armed Forces; a brief comparison of military forces of the world; the missions, capabilities, and interdependence of the United States Army, the United States Navy and the United States Air Force; the role of the Army in conceivable types of warfare. Instruction relies heavily on Military History for background
and support. Instructor-student discussions include development of, and major problems of the United States Army, with emphasis on the following:

1. Uncertainty of time, type, and location of possible future wars and price of defeat. 2. Necessity for an adequate Army, and in particular, a large Army Reserve. 3. Manpower and training problems. 4. Research and new development. 5. Military obligations of citizenship and Public Relations. 6. Opportunity for leadership in the Army through ROTC.

Upon successful completion of the advanced course, cadets receive a commission as a Second Lieutenant in one of the arms or services of the Army. The academic field of study and the needs of the service generally determine the branch assignment.

Army Sponsored ROTC Flight Training. A course in Flight Training is offered to selected Senior Army ROTC students. Instruction is so arranged that it will not interfere with ROTC or regular academic schedules. For acceptance in the course, students must be enrolled in MS IV ROTC or have successfully completed MS IV and summer camp, and be scheduled to graduate from the University within the same academic year. Academic credit may be arranged upon completion of the program. Interested students must meet class I physical standards for flying as prescribed in AR 40-110 and TB MED 244. The flight program consists of 71 1/2 hours of training: 35 hours of ground, and 36 1/2 hours of actual flight instruction. Completion of this training qualifies students for a Civil Aeronautics Administration (CAA) pilots license. All training is conducted by CAA approved instructors. ROTC cadets interested in participating in flight training should see their Military Science Class Advisor for further information.

Summer Camp. A six weeks summer camp is held at Fort Lewis, Washington, for first year advanced students. ROTC cadets must attend this course of training between their junior and senior years. Practical application of classroom theory and living in the field make it an interesting and stimulating experience. Students receive pay for time spent at camp and for travel to and from camp.

Veterans. Veterans are accepted into the Army ROTC advanced program provided they can qualify as outlined in preceding regulations. All or part of the basic program may be waived depending upon length of service of the individual. Present Department of the Army policy provides that veterans may serve a period of active duty service.

High School ROTC. Credit for Junior Division ROTC is allowed upon presentation of a Military Training Certificate indicating full completion of the three-year high school program. The three-year high school program is considered equivalent to the first year basic course, Senior Division. Enrolment in second year basic course is usually authorized only when the student attains sophomore standing.

Quotas. There is no quota or restriction for enrollment in the basic course. At present there is no limiting quota for entrance into the Army ROTC advanced program.

Payment to Advanced Students. Students enrolled in the advanced course are paid a "Subsistence Allowance" amounting to approximately $27.00 per month. These payments normally continue from time of enrollment until completion of the course and include normal vacation periods. (Only one summer vacation period may be paid for.) While at summer camp, however, no subsistence is paid, but students receive pay at the rate prescribed for basic private plus travel pay to and from camp.

Service Schools. The first duty assignment after being commissioned is normally to a service school. These schools are located throughout the U.S. and are usually 12 weeks in duration. Specialized instruction is given to prepare the Second Lieutenant in his assigned branch of service.
Delay of Entry on Active Duty. Students who complete the Army ROTC program and are commissioned may delay entry upon active duty, if they wish, to continue their studies in certain fields. Information regarding specific fields of study and procedure may be obtained upon request.

Texts and Uniforms. All texts and uniforms are furnished at no expense to the student other than a combination deposit and laboratory fee of $5. Of this fee, $3.00, less the cost of lost equipment, is returned to the student at the end of the school year or when he drops from the program.

Division of Basic Military Science (MS I and MS II)
Director—Major Charles R. Clark

11. Military Science I. Organization of the Army and ROTC; Individual Weapons and Marksmanship; School of the Soldier and Exercise of Command. Two (2) hours drill are required each week during the Fall and Spring course. (1F) Tilley

12. Military Science I. Individual Weapons and Marksmanship; American Military History. (1W) Tilley

13. Military Science I. American Military History; School of the Soldier and Exercise of Command. (1S) Tilley

21. Military Science II. Map Reading; School of the Soldier and Exercise of Command. (1F) Clark

22. Military Science II. Aerial Photograph Reading; Role of the Army in World Affairs; Crew Served Weapons and Gunnery; School of the Soldier and Exercise of Command. (1W) Clark

23. Military Science II. Crew Served Weapons and Gunnery; School of the Soldier and Exercise of Command. (1S) Clark

24. Military Science II Special Studies. This course offers special tutored study to students who have not been able to take Basic Courses at their regular offering time. (IF, 1W, 1S) Clark

Division of Advanced Military Science (MS III and MS IV)
Director—Major Lewis A. Civille

131. Military Science III. Leadership; Military Teaching Methods; Organization, Function, and Mission of the Arms and Services; School of the Soldier and Exercise of Command. Two hours drill required each week during the Fall and Spring Course. (3F) Civille

132. Military Science III. Organization, Function, and Mission of the Arms and Services; Small Unit Tactics. (3W) Civille

133. Military Science III. Small Unit Tactics; School of the Soldier and Exercise of Command. (3S) Civille

141. Military Science IV. Operations; School of the Soldier and Exercise ofCommand. Two hours drill required each week during the Fall and Spring Course. (3F) Mayfield


143. Military Science IV. Military Administration, Service Orientation, School of the Soldier and Exercise of Command. (3S) Mayfield

150. Military Science Summer Camp. Six weeks practical training at a regular Army post. Attendance at summer camp is required of all advanced military science students. Students attend during the summer following completion of Military Science III. (6 summer)
Joint Army-Air Force Courses or Activities

Sponsor Corps. A semi-military organization composed of 75 coeds elected to the Corps by popular vote of the Army and Air Force Advanced Cadets. Only freshmen and transfer students who are freshman or first quarter sophomores may apply to fill annual vacancies.

ROTC Band. A Military band under the direction of the College Band Instructor but governed by the policies of the Departments of Military and Air Science. Students selected for the band will enroll for Military or Air Science classroom work but drill with the band.

Pershing Rifles. The National Society of Pershing Rifles was formed "to foster a spirit of friendship and cooperation among men in the Military Department and to maintain a highly efficient drill company." Company "G", 9th Regiment is located at USU. Pershing Rifles has an Army Platoon and an Air Force Flight and is open to any basic or advanced cadet as long as the number does not exceed 60 basics and 7 advanced students.

Rifle Team. Established to promote marksmanship among Army and Air Force Cadets. Team competes in several regional and national invitational tournaments.

Society of American Military Engineers. A National professional society devoted to discussion, study, and training in problems related to Military Engineering.

ROTC Band Courses

1B, 2B, 3B. ROTC Band, First Year. (IF, 1W, 1S) Staff
4B, 5B, 6B. ROTC Band, Second Year. (IF, 1W, 1S) Staff

Sponsor Corps Courses

51, 52, 53. Military Science Sponsor Drill. A course in leadership organization and drill for women elected to Corps of Sponsors. (IF, 1W, 1S) Staff
54, 55, 56. Military Science Sponsors Drill. (Sophomore) (IF, 1W, 1S) Staff
151, 152, 153. Military Science Sponsor Drill. (Junior) (IF, 1W, 1S) Staff
154, 155, 156. Military Science Sponsor Drill. (Senior) (IF, 1W, 1S) Staff

Pershing Rifles

37, 38, 39. Pershing Rifle Drill, Freshmen. (IF, 1W, 1S) Clark
40, 41, 42. Pershing Rifle Drill, Sophomores. (IF, 1W, 1S) Clark
137, 138, 139. Pershing Rifle Drill, Advanced Cadet Staff. (IF, 1W, 1S) Clark
The purpose of the Air Force ROTC program is to prepare young men to serve as officers in the Reserve and Regular components of the Air Force. Designed to supplement college training, the Air Force ROTC course develops the attributes of character, leadership and personality essential to every Air Force officer and citizen of the United States. It is not the purpose of the course to train students in specific fields, but rather to give them a general understanding of the mission of the Air Force, its organization, problems and techniques. In addition, the academic phase of the course develops a background in national and international affairs to aid students to intelligently interpret and evaluate world events.

Since the Air Force is primarily engaged in providing the Air Power of our armed forces, most of the students who complete the AFROTC program and commissioned in the Air Force are required to take flight training after going on active duty. The types of flight training usually expected of graduates are either pilot or navigator-observer. Both courses take approximately one year to complete. During this training, students receive the pay of a Second Lieutenant (approximately $5590.00 per year). Upon completion of a light training, students serve 4 years on active duty with the Air Force. In addition, it is possible for the senior cadet to participate in Air Force ROTC Flight Instruction Program (FIP) prior to graduation. Successful completion of the course enables the cadet to acquire a private pilot's license in light aircraft. The course consists of 36:30 hours of instruction and a CAA examination. Students not qualified for flight training may be enrolled in the advanced AFROTC provided they qualify in certain specialized fields, such as Electronics, Meteorology, Engineering and Nuclear Physics. A small number of outstanding students may be accepted into the advanced course each year who are neither qualified for flight training nor for the specialized program mentioned above. Students who are classified as veterans under the Universal Military Training Act may enroll in the advanced course without regard to qualification for flight or specialized training. All students, not taking flight training, commissioned in the Air Force Reserve, except veterans, are required to serve a total of three years on active duty.

Structure of the AFROTC Course. The course is divided into two phases; the basic and the advanced. The basic phase is usually taken during a student's freshman and sophomore years. The advanced is normally taken during the junior and senior years and has, in addition to the normal school work, a summer training period of four weeks. The summer training is taken during the summer between the junior and senior years at an Air Force installation. Students are paid for the cost of travel to and from camp and are paid regular service pay while attending the camp.
Quotas. There is no quota or restriction for enrollment into the basic phase. A production quota is established yearly by Air Force Headquarters for enrollment in the advanced phase. The quota is based on the estimated needs of the Air Force for officers of various skills and stipulates the number that can be commissioned each year.

Summer Camp. A four-week summer training period is a required part of the advanced phase. Generally two training periods are offered each summer. Students may choose which camp they desire to attend, however, the summer training must be taken between the Junior and Senior years. These camps are held at various Air Force bases throughout the country. Students are usually scheduled to attend the camp nearest their home. Most students living in Utah and Idaho attend camps in California, Arizona, Nevada or Washington.

Veterans. Veterans are accepted into the AFROTC program without regard to quota spaces. Those veterans who meet the age requirements, physical qualifications and complete the program are commissioned Second Lieutenants in the Air Force Reserve but are not required to serve on active duty. Parts of the basic phase of the program may be waived for military service, however, no portion of the basic phase will be waived which the veteran could take prior to becoming eligible for entrance into the advanced phase.

High School ROTC. Because of the difference between the Army and Air Force ROTC programs, no credit in AFROTC is given students who have taken high school ROTC.

Scheduling. Cadets must schedule Air Science classes upon their initial enrollment at the University.

Payment to Advanced Students. Students enrolled in the advance course are paid a “subsistence allowance” amounting to approximately $27.00 per month. These payments normally continue from the time of enrollment until completion of the course and include normal vacation periods. While at summer camp no subsistence is paid, but students receive pay at the rate prescribed for basic airmen plus travel pay to and from camp.

Flight Training After Graduation. Flight training is taken after entry on active duty. When a student is selected for entrance into the advanced program, he is selected for one of four general categories, i.e., Flying, Special Training, General, or Veteran. Those selected for flying must maintain their qualification for such training. They must submit an application for such training soon after beginning their senior year. At the time they graduate from college, they are commissioned in the Air Force Reserve and are called to active duty in the Air Force during the next year. Upon going on active duty, the student immediately enters flying school.

Flight Training Prior to Graduation: (FIP). Senior AFROTC Cadets, Category I, are eligible to participate in flying training while at the University. Training in light aircraft operation includes classroom work in weather, navigation, CAA regulations, radio, procedures and pre-flight checks, and solo, cross-country and a CAA examination.

Delay of Entry on Active Duty. Students who complete the AFROTC program and receive their commissions may request a delay in being called to active duty if they desire to continue their studies in certain fields. Such delays are for six months and may be renewed each six months until studies are completed. Students who are slated for flight training, however, must enter such training before reaching their 27th birthday. (Students who turn 27 while enrolled in the AFROTC program must enter flight training before reaching their 28th birthday.)

Texts and Uniforms. All texts and uniforms are furnished at no expense to the student, other than a combination deposit and laboratory fee of $5.00. Of this fee, $3.00, less the cost of laundry and dry cleaning the uniform and the cost of lost equipment, is returned to the student at the end of the school year or when he drops from the program.
Air Force Chaplains. Students who meet special requirements may be commissioned as Chaplains in the Air Force. Selection of these individuals rests with the Chief of Chaplains, United States Air Force, Washington, D.C. Interested persons are urged to contact members of the AFROTC staff for further information.

Air Force ROTC Library. A library of Air Force periodicals and publications is maintained for the Air Force ROTC Cadet. Material relative to the Air Force ROTC curriculum is available to the Air Force ROTC Cadet.

Air Force ROTC Counseling Service. Air Force ROTC Detachment maintains individual counseling service for the individual cadet. Service is offered primarily in areas concerned with the Air Force ROTC curriculum (Education, study, and leadership).

Air Science Courses

Two hours drill are required each week during the fall and spring courses.

Air Science I—First Year Basic—Air Force

11. Air Science. Introduction to Aviation. Includes: Elementary theory of flight, power plants, history of aviation, and aviation between WW I and WW II. Course also introduces student to the AFROTC course, the USU program and the regulations which govern cadets. Reasons for the ROTC program and obligations of service are also covered. (IF)

12. Air Science. This course consists of two phases. Fundamentals of Global Geography, the first phase, consists of the tools of geography, geography of climate, global geography, geographical basis of power and military geography, especially as related to Air Power. International Tensions and Security Organizations, the second phase, consists of a study of the factors which contribute to a nation's power and therefore Air Power. Those factors are related to such major sources of world tensions as democracy vs communism, nationalism, colonialism and cultural and economic conflicts. Included in this study, are the attempts to reduce world tensions through such organizations as the League of Nations and the United Nations. Modern power alignments, in relation to Air Power, are also studied, i.e., the communist bloc, NATO, and Western Hemisphere organizations. (IW)

13. Air Science. A study of Air Power as a military instrument of national security. Aspects covered include; development of Air Power, patterns of modern warfare, characteristics and capabilities of military aviation, roles of military aviation, military aviation as affected by national interests, policies and objectives, planning and accomplishment of the USAF missions, and military aviation in the future. (IS)

Air Science II—Second Year Basic—Air Force

21. Air Science. Introduction to Aerial Warfare. This course consists of two phases; aerial warfare and targets and weapons. Aerial warfare is devoted to the study of the characteristics of the air ocean as pertaining to aerial warfare. Included is the nature of aerial warfare in relationship to national objectives, war and national objectives, phases of war and military contribution to national objectives. The second phase, Targets and Weapons, consists of a study of the nature of targets, types of targets, sources of target information, and target selection. Study of weapons includes, conventional weapons, atomic, nuclear, rocket propulsion, chemical, biological and psychological in relation to weapons types and their effects upon targets. (IF)

22. Air Science. Study of the design and characteristics of various types (propeller, jet, auxiliary systems, pilotless aircraft) of delivery aircraft in re-
relationshipt to purposes for which designed. Study of the air base as a platform of delivery includes types of air bases, significance of air bases in national defense, and the political, geographic, technical and military problems of air bases. (1W)

23. Air Science. Operations. Study of the various types of combat operations such as strategic, theater, air transport and air defense. Included in this study are operational concepts, resources, time and space application, organizational systems, force employment and deployment interdiction, objectives, war plans, operations plans and relationships of operation to United States Air Policies. (1S)

Air Science III, First Year Advanced AFROTC Course

131. Air Science. This subject consists of three phases: Responsibilities of an Air Force Commander, Communicating in the Air Force and Instructing in the Air Force. Responsibilities of an Air Force Commander and concentrates on the functions of a commander, planning directing, coordinating, organizing and controlling. Functions of a staff officer and organization of the Air Staff is covered also. Communications consist of the nature of communications and its barriers in effective Air Force communication observation, listening and reading as learning techniques, communication techniques and their importance in the Air Force, effective Air Force writing skills and effective speaking in the Air Force. Instructing in the Air Force covers principles of learning, personal and professional qualities of instructors, instruction planning, instruction methods, instruction aids, instructional management and evaluation of instruction as pertaining to instructor duties of Air Force Officers. (3F)

132. Air Science. This course consists of two phases, creative problem solving and military justice systems. The first twenty-five hours are devoted to the various aspects of creative problem solving. Thought processes, logic, imagination and creative thinking are integrated into the study of such creative problem solving techniques as the scientific research method, the staff study, and individual and group brainstorming. Practical application of techniques is provided through realistic problems of Air Force nature. The Military Justice System, the second phase of the course, involves a study of legal procedures in the Air Force. Rights, duties and responsibilities under the Military Justice System are stressed. Mock court-martials are utilized in presentation of material. (3W)

133. Air Science. This course consists of three phases: Weather, Navigation and Air Base Functions. The weather phase of this course is devoted to the study of earth and space, circulation and wind patterns, temperature and heat transfer, pressure, moisture, stability, fog, icing and world weather as it pertains to the Air Force. The Navigation phase is devoted to the study of aeronautical maps and charts, navigational projections, map and chart interpretation, and navigational devices such as navigational computers. Basic navigational problems are integrated into the course. The Air Base Functions phase consists of a study of the various functional organizations on a typical Air Force base such as personnel services, security, medical services, transportation, supply, flight operations, and command functions. (3S)

150. Air Science. Air Force ROTC Summer Training Unit consists of four weeks (144 contact hours) of practical training. Training is directed toward providing a variety of practical Air Force experiences. Among the experiences offered in tour and lecture form by regular Air Force officers are such subjects as electronic communication, navigation, weather, survival training, air base security, aircraft traffic control, first aid and sanitation, supply, biological and chemical warfare. Pressure and altitude chamber experience complete with orientation lectures, as given to regular Air Force jet pilots, permits the cadet to ride in jet aircraft. A minimum of two flights permitted to each cadet — one thirty minute jet ride and one ride on another type aircraft as a crew member. Cadets participate in preflight and post flight briefings, and receive emergency equipment indoctrination. In addition, dem-
onstrations and field trips are provided to airfield installations and nearby aircraft factories, as well as local fire power demonstrations. Practical leadership training is provided through group calisthenics, individual and group sports, weapons familiarization in US pistol and carbine and directing cadet operations. Individual counselling is provided for the cadet in problem areas.

The cadet attends the Summer Training Unit between his junior and senior year. Exemption from attendance at this time is granted only by the Professor of Air Science based upon emergency situations or extreme hardship.

**Air Science IV, Second Year Advanced AFROTC Course**

141. **Air Science.** Leadership and Management Seminar. Study consists of three phases; principles of leadership, the nature of man, and applications in leadership situations. All phases are integrated into Air Force problems in leadership and management areas. Insight and experience in Air Force leadership and management problems is provided through role playing, group and individual problem solving, group discussion and panel discussion. Translation of knowledge into speaking, writing and listening skills is also emphasized. Course is directed toward full development of the individual's leadership potentialities both as an Air Force Officer and a civilian leader. (3F)

142. **Air Science.** Military Aspects of World Political Geography. This course is concerned primarily with the impact of air power on global relations. Air Power is studied in relationship to the framework of international politics (state system, political power, contemporary ideologies, propaganda, regionalism and defensive alliances). Air Power is also related to the factors which influence the power of states. World powers and strategic areas, as pertains to Air Power, are also studied, i.e., The Artic Areas, USSR, China, The Americas, Middle East, Africa, South and Southeast Asia and the Pacific Defense areas. The implications of atomic power and problems of armament control in the atomic age and in relation to Air Power are included. (3W)

143. **Air Science.** This course consists of two phases; Military Aviation and the Evolution of Warfare consists of a study of the principles of war, basic combat tactics from Hannibal through the Korean Action including history of naval and ground warfare and the future role of Air Power. The second phase, approximately ten hours, is devoted to a briefing for Commissioned Service. (3S)
Summer School at Utah State University is one of our most attractive educational offerings. Studying in beautiful Cache Valley, with its many educational and recreational opportunities, students may pursue their educational interests and enjoy recreational offerings unsurpassed on any college campus in America.

A major purpose of this outstanding educational opportunity is to bring to Logan the finest in our resident staff along with the leading educators of the nation. This policy has enabled us to build, in this intermountain area a summer school of national importance.

The equivalent of a quarter's work is offered in the two five week terms. During the Summer School, all departments of the college offer courses. The program is arranged to meet the special needs of summer school and regular students. Courses offered in Education, Psychology, and other related departments make it possible for students to meet all requirements for Utah certification. This curriculum is also designed to meet requirements for certification in most of the surrounding states.

The student body is composed of regular students, teachers and administrators in secondary and elementary schools. At present an increasing number of regular students are continuing their education through the summer school program. High school graduates are also entering the college immediately rather than postponing entrance until the Fall Quarter. Former military personnel who are receiving government aid are especially interested in the regular summer program inasmuch as nearly all of them wish to complete their education as quickly as possible. The summer curriculum is arranged to meet this trend. Consequently, practically all departments are offering much of their regular program in the Summer Quarter.

Numerous lectures, lyceum numbers in music and drama, canyon parties, steak fries, and other recreational opportunities are a regular scheduled part of the summer school offering.

**Graduate Credit**

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science or the Master of Education degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to obtain this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved by the time of registration.

The Summer School catalog containing detailed announcements of course offerings is issued annually in January and is available upon request at the Director's office.

**HOME STUDY DIVISION**

The Utah State University has a liberal offering of courses in the Home Study (correspondence) Division. Home study furnishes an excellent opportunity for systematic instruction to students of high school or college grade and to all adults who desire to secure information and professional improvement in selected fields.
Students should be at least 19 years of age, or must submit 15 units of high school work, or must be graduates of a high school for admission to Home Study courses of college grade. One-fourth of the credits necessary for a degree (45) may be earned through this department.

All home study courses with few exceptions include a final examination.

Regular day school students may register for home study courses. When this is done, however, such courses become a part of their total load. If the home study or the residence registration exceeds the maximum amount permitted by the Institution, then the students must obtain the permission of their advisor and the dean of the college concerned to carry this excess load.

Each college of the University, 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.


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 University and also for those who wish to fit themselves for careers in which the equivalent of a high school education is necessary.

Graduation Deadline: Seniors who plan to apply home study credits toward graduation must have their course completed by May 1, in order that lessons and examination may be corrected and credit on file in the Registrar's Office two weeks prior to the day of graduation.

High School Fees: The enrollment for a high school course is $15 for one unit of credit or $10 for one-half unit credit. No courses will be accepted for graduation unless started at least by March 1 in any year. All work must be completed one month before credit is needed.

U.S.A.F.I. Courses: The Home Study Division is cooperating with the United States Armed Forces Institute (U.S.A.F.I.) at Madison, Wisconsin, to provide Home Study courses at the Utah State University at a reduced cost to men and women who are on active service in the Army, Navy, Air Force, Marine Corps, or Coast Guard. A member of the armed forces who wishes to enroll for such courses should contact the education and information center at the base where he is located. If he needs further information, he may write directly to Home Study Division, Utah State University, Logan, Utah.

Veterans: The Utah State University is approved by the Veterans Administration to offer Home Study courses under the G.I. Bill of Rights (P.L. 550).

All veterans desiring home study courses should first contact their local Veterans Administration Regional Office and find out whether or not they are still eligible to continue their schooling under the G.I. benefits, and if so what procedures they must follow to do so.

Fees: A fee of $5.00 per credit hour is charged. High school course fees are: $15 per unit and $10 per half unit.

Home Study Catalog: Individuals interested in home study courses are invited to write the Home Study Division, U.S.U., Logan, Utah, for a catalog of special offerings.
The Division of Off-Campus Instruction is fully accredited by the National University Extension Association.

Off-Campus Classes. Off-Campus Courses are offered in many departments in selected resident centers in the State. In-service courses for teachers are available in every department, including classes for the renewal of teaching certificates. Classes are also available in vocational subjects and for special-study groups.

All credit obtained through the Division of Off-Campus Instruction is classified as off-campus credit and meets all requirements for graduation except the "15 hours of on-campus" rule.

Off-Campus classes for graduate students are given with special permission of the Graduate School.

Credit for Study-Tours: The Division of Off-Campus Instruction, for the school year 1957-58, is conducting a study tour to Mexico with or without credit. A student may earn six to nine quarter hours while taking such a tour. For further information contact the Division of Off-Campus Instruction, Utah State University, Logan, Utah.

Regulations for Off-Campus Instruction Classes for Credit

All instructors in off-campus courses are either members of the regular teaching faculty officially assigned to the teaching project concerned, or non-resident members appointed by the head of the department with the approval of the dean concerned and the administration.

Off-campus credit courses given by direct class instruction shall:

(a) be equivalent in content, hours of class instruction and preparation, to similar courses offered in campus residence work.

(b) be subject to the same prerequisites as comparable campus courses, or as the departments may prescribe, including a comprehensive final examination.

Evening Classes: The heads of departments with the approval of the deans concerned will schedule a number of campus day classes in the evening hours. In the event a group of teachers desire courses which are not so scheduled, arrangements may be made to organize classes to meet the needs through the off-Campus Instruction Division.

Fees: A fee of $6 per credit hour is charged registrants for all Off-Campus Instruction courses with or without credit (for other regulations concerning off-campus credits, see section on "Graduation" in the Introduction of this catalog). Groups of individuals interested in Off-Campus courses should send inquiries to Director of Off-Campus Instruction Division, U.S.U., Logan, Utah.
### SUMMARY OF ATTENDANCE 1956-57

#### REGULAR SCHOOL YEAR 1956-57 (SEPTEMBER TO JUNE)

<table>
<thead>
<tr>
<th>Sub Coll.</th>
<th>Freshmen</th>
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<th>Juniors</th>
<th>Seniors</th>
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<td>Forestry</td>
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</tr>
<tr>
<td>Home &amp; Fam. Living</td>
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<tr>
<td>Human. &amp; Science</td>
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<td>TOTALS</td>
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<td>916</td>
<td>457</td>
<td>4982</td>
</tr>
</tbody>
</table>
# INDEX

<table>
<thead>
<tr>
<th>Academic Colleges and Departments</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accreditation</td>
<td>38</td>
</tr>
<tr>
<td>Accounting</td>
<td>39</td>
</tr>
<tr>
<td>Administration</td>
<td>109</td>
</tr>
<tr>
<td>Admission</td>
<td>8</td>
</tr>
<tr>
<td>Aeronautical Technology</td>
<td>44</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>182</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>81</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td>77</td>
</tr>
<tr>
<td>Agricultural Experiment Station</td>
<td>83</td>
</tr>
<tr>
<td>Agriculture, College of</td>
<td>165</td>
</tr>
<tr>
<td>Agriculture, General and Specialized</td>
<td>103</td>
</tr>
<tr>
<td>Agronomy</td>
<td>79, 80</td>
</tr>
<tr>
<td>Air Science</td>
<td>85</td>
</tr>
<tr>
<td>Alumni Association</td>
<td>263, 270</td>
</tr>
<tr>
<td>Animal Husbandry</td>
<td>43</td>
</tr>
<tr>
<td>Applied Statistics</td>
<td>79</td>
</tr>
<tr>
<td>Army ROTC</td>
<td>92</td>
</tr>
<tr>
<td>Army-Air Force Courses or Activities</td>
<td>266</td>
</tr>
<tr>
<td>Art (See Visual Arts)</td>
<td>269</td>
</tr>
<tr>
<td>Assistantships</td>
<td>137</td>
</tr>
<tr>
<td>Associated Students</td>
<td>75</td>
</tr>
<tr>
<td>Associated Women Students</td>
<td>56</td>
</tr>
<tr>
<td>Athletics</td>
<td>146</td>
</tr>
<tr>
<td>Attendance Summary</td>
<td>278</td>
</tr>
<tr>
<td>Automotive Technology</td>
<td>185</td>
</tr>
<tr>
<td>Awards, Honors, Scholarships</td>
<td>57</td>
</tr>
<tr>
<td>Bachelor of Science Degree</td>
<td>51</td>
</tr>
<tr>
<td>Bacteriology and Public Health</td>
<td>232</td>
</tr>
<tr>
<td>Band, ROTC</td>
<td>269</td>
</tr>
<tr>
<td>Band, University</td>
<td>144</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>235</td>
</tr>
<tr>
<td>Biology</td>
<td>228, 232</td>
</tr>
<tr>
<td>Board of Trustees</td>
<td>8</td>
</tr>
<tr>
<td>Botany and Plant Pathology</td>
<td>93</td>
</tr>
<tr>
<td>Branch Colleges</td>
<td>42</td>
</tr>
<tr>
<td>Buildings, Campus</td>
<td>40</td>
</tr>
<tr>
<td>Business Administration</td>
<td>108</td>
</tr>
<tr>
<td>Business Management</td>
<td>110</td>
</tr>
<tr>
<td>Business Education</td>
<td>111</td>
</tr>
<tr>
<td>Business and Social Sciences, College of</td>
<td>107</td>
</tr>
<tr>
<td>Cafeteria (see Student Union)</td>
<td>40</td>
</tr>
<tr>
<td>Calendar of Events</td>
<td>2</td>
</tr>
<tr>
<td>Campus Map</td>
<td>4</td>
</tr>
<tr>
<td>Campus Organizations</td>
<td>56</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>235</td>
</tr>
<tr>
<td>Chemistry</td>
<td>166</td>
</tr>
<tr>
<td>Child Development and Parent Education</td>
<td>217</td>
</tr>
<tr>
<td>Civil and Irrigation Engineering</td>
<td>167</td>
</tr>
<tr>
<td>Class Standing</td>
<td>45</td>
</tr>
<tr>
<td>Clothing, Textiles and Related Arts</td>
<td>218</td>
</tr>
<tr>
<td>College of Agriculture</td>
<td>218</td>
</tr>
<tr>
<td>College of Business and Social Sciences</td>
<td>77</td>
</tr>
<tr>
<td>College of Education</td>
<td>107</td>
</tr>
<tr>
<td>College of Education</td>
<td>129</td>
</tr>
<tr>
<td>College of Engineering and Technology</td>
<td>161</td>
</tr>
<tr>
<td>College of Forest, Range and Wildlife Management</td>
<td>199</td>
</tr>
<tr>
<td>College of Home and Family Living</td>
<td>215</td>
</tr>
<tr>
<td>College, Snow</td>
<td>42</td>
</tr>
<tr>
<td>Page</td>
<td>College of Southern Utah</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>42</td>
<td></td>
</tr>
<tr>
<td>227</td>
<td></td>
</tr>
<tr>
<td>263</td>
<td></td>
</tr>
<tr>
<td>275</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td></td>
</tr>
<tr>
<td>237</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td></td>
</tr>
<tr>
<td>73</td>
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<td></td>
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<td>71</td>
<td></td>
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<tr>
<td>72</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
<tr>
<td>186</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td></td>
</tr>
<tr>
<td>164</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td></td>
</tr>
<tr>
<td>135</td>
<td></td>
</tr>
<tr>
<td>129</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td></td>
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<tr>
<td>135</td>
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</tr>
<tr>
<td>132</td>
<td></td>
</tr>
<tr>
<td>135</td>
<td></td>
</tr>
<tr>
<td>191</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td></td>
</tr>
<tr>
<td>166</td>
<td></td>
</tr>
<tr>
<td>235</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td></td>
</tr>
<tr>
<td>164</td>
<td></td>
</tr>
<tr>
<td>174</td>
<td></td>
</tr>
<tr>
<td>162</td>
<td></td>
</tr>
<tr>
<td>181</td>
<td></td>
</tr>
<tr>
<td>178</td>
<td></td>
</tr>
<tr>
<td>239</td>
<td></td>
</tr>
<tr>
<td>259</td>
<td></td>
</tr>
<tr>
<td>261</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td></td>
</tr>
<tr>
<td>181</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>11</td>
</tr>
<tr>
<td>Federal Collaborators</td>
<td>80</td>
</tr>
<tr>
<td>Fees</td>
<td>52</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>137</td>
</tr>
<tr>
<td>Foods and Nutrition</td>
<td>220</td>
</tr>
<tr>
<td>Foreign Student Advisor</td>
<td>67</td>
</tr>
<tr>
<td>Forest Management</td>
<td>208</td>
</tr>
<tr>
<td>Forest, Range and Wildlife Management, College of</td>
<td>199</td>
</tr>
<tr>
<td>Fraternities, Honorary and Social</td>
<td>56</td>
</tr>
<tr>
<td>French</td>
<td>250</td>
</tr>
</tbody>
</table>
## INDEX

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education, Two-Year Program</td>
<td>223</td>
</tr>
<tr>
<td>General Information</td>
<td>37</td>
</tr>
<tr>
<td>Geology</td>
<td>244</td>
</tr>
<tr>
<td>German</td>
<td>251</td>
</tr>
<tr>
<td>Grade Points</td>
<td>45</td>
</tr>
<tr>
<td>Graduate Studies, School of</td>
<td>70</td>
</tr>
<tr>
<td>Graduation</td>
<td>50, 51</td>
</tr>
<tr>
<td>Greek Language</td>
<td>252</td>
</tr>
<tr>
<td>Greek Organizations</td>
<td>56</td>
</tr>
<tr>
<td>Group Requirements</td>
<td>48</td>
</tr>
<tr>
<td>Health, Physical Education, and Recreation</td>
<td>146</td>
</tr>
<tr>
<td>Health Service</td>
<td>64</td>
</tr>
<tr>
<td>High School Teacher’s Certificate, Requirements for</td>
<td>52</td>
</tr>
<tr>
<td>History and Political Science</td>
<td>119</td>
</tr>
<tr>
<td>History and Organization of University</td>
<td>57</td>
</tr>
<tr>
<td>Home and Family Living, College of</td>
<td>215</td>
</tr>
<tr>
<td>Home Economics Education</td>
<td>224</td>
</tr>
<tr>
<td>Home Study</td>
<td>275</td>
</tr>
<tr>
<td>Horticulture and Vegetable Crops</td>
<td>97</td>
</tr>
<tr>
<td>Household Administration</td>
<td>222</td>
</tr>
<tr>
<td>Housing</td>
<td>65</td>
</tr>
<tr>
<td>Humanities</td>
<td>229</td>
</tr>
<tr>
<td>Incomplete Work</td>
<td>47</td>
</tr>
<tr>
<td>Industrial Arts</td>
<td>189</td>
</tr>
<tr>
<td>Industrial Education</td>
<td>188</td>
</tr>
<tr>
<td>Industrial Management</td>
<td>111, 190</td>
</tr>
<tr>
<td>Intercollegiate Athletics</td>
<td>146</td>
</tr>
<tr>
<td>Intramural Sports</td>
<td>146</td>
</tr>
<tr>
<td>Irrigation Engineering</td>
<td>167</td>
</tr>
<tr>
<td>Journalism</td>
<td>239, 242, 244</td>
</tr>
<tr>
<td>Landscape Architecture and Planning</td>
<td>246</td>
</tr>
<tr>
<td>Languages</td>
<td>250</td>
</tr>
<tr>
<td>Late Registration</td>
<td>45</td>
</tr>
<tr>
<td>Latin</td>
<td>250, 252</td>
</tr>
<tr>
<td>Liberal Studies</td>
<td>247</td>
</tr>
<tr>
<td>Libraries</td>
<td>41</td>
</tr>
<tr>
<td>Library Science</td>
<td>145</td>
</tr>
<tr>
<td>Loan Funds</td>
<td>62, 67</td>
</tr>
<tr>
<td>Low Scholarships and Probation</td>
<td>47</td>
</tr>
<tr>
<td>Lower Division</td>
<td>48</td>
</tr>
<tr>
<td>Major Subjects</td>
<td>49</td>
</tr>
<tr>
<td>Management, Business</td>
<td>110</td>
</tr>
<tr>
<td>Map, Campus</td>
<td>2</td>
</tr>
<tr>
<td>Marriage Counseling Service</td>
<td>63</td>
</tr>
<tr>
<td>Master of Education</td>
<td>72, 275</td>
</tr>
<tr>
<td>Master of Forestry</td>
<td>72</td>
</tr>
<tr>
<td>Master of Science</td>
<td>70, 275</td>
</tr>
<tr>
<td>Mathematics</td>
<td>248</td>
</tr>
<tr>
<td>Mechanical Drawing</td>
<td>164</td>
</tr>
<tr>
<td>Medical Technology</td>
<td>231</td>
</tr>
<tr>
<td>Merchandising</td>
<td>113</td>
</tr>
<tr>
<td>Metal Work</td>
<td>178</td>
</tr>
<tr>
<td>Military Science and Tactics</td>
<td>263</td>
</tr>
<tr>
<td>Minor Subjects</td>
<td>49</td>
</tr>
<tr>
<td>Modern Languages and Latin</td>
<td>250</td>
</tr>
<tr>
<td>Music</td>
<td>142</td>
</tr>
<tr>
<td>Subject</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Non-Resident Fee</td>
<td>53</td>
</tr>
<tr>
<td>Nursing</td>
<td>231, 232</td>
</tr>
<tr>
<td>Nutrition</td>
<td>74</td>
</tr>
<tr>
<td>Objectives of University</td>
<td>37</td>
</tr>
<tr>
<td>Off-campus Instruction</td>
<td>277</td>
</tr>
<tr>
<td>Officers of Administration</td>
<td>8</td>
</tr>
<tr>
<td>Opera</td>
<td>144</td>
</tr>
<tr>
<td>Orchestra</td>
<td>143</td>
</tr>
<tr>
<td>Orientation</td>
<td>68</td>
</tr>
<tr>
<td>Pershing Rifles</td>
<td>269</td>
</tr>
<tr>
<td>Philosophical Literature</td>
<td>229, 252</td>
</tr>
<tr>
<td>Philosophy</td>
<td>229, 252</td>
</tr>
<tr>
<td>Photographic Journalism</td>
<td>244</td>
</tr>
<tr>
<td>Photography</td>
<td>244</td>
</tr>
<tr>
<td>Physical Education and Recreation</td>
<td>146</td>
</tr>
<tr>
<td>Physical Science</td>
<td>228</td>
</tr>
<tr>
<td>Physics</td>
<td>253</td>
</tr>
<tr>
<td>Physiology</td>
<td>259, 262</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>93</td>
</tr>
<tr>
<td>Political Science</td>
<td>119, 121</td>
</tr>
<tr>
<td>Portuguese</td>
<td>252</td>
</tr>
<tr>
<td>Poultry Husbandry</td>
<td>100</td>
</tr>
<tr>
<td>Pre-dental Training</td>
<td>231</td>
</tr>
<tr>
<td>Pre-legal Training</td>
<td>123</td>
</tr>
<tr>
<td>Pre-medical Training</td>
<td>230</td>
</tr>
<tr>
<td>Pre-veterinary Training</td>
<td>102</td>
</tr>
<tr>
<td>Private Instruction, Music (see Music)</td>
<td></td>
</tr>
<tr>
<td>Private Instruction, Speech (See Speech)</td>
<td></td>
</tr>
<tr>
<td>Probation</td>
<td>47</td>
</tr>
<tr>
<td>Psychology and Guidance</td>
<td>154</td>
</tr>
<tr>
<td>Publications</td>
<td>55</td>
</tr>
<tr>
<td>Public Health</td>
<td>233, 234</td>
</tr>
<tr>
<td>Radio (see Electrical Engineering, Journalism, Speech)</td>
<td>201</td>
</tr>
<tr>
<td>Range Management</td>
<td>46, 52</td>
</tr>
<tr>
<td>Registration and Credits</td>
<td>68</td>
</tr>
<tr>
<td>Religion</td>
<td>103, 181</td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>Reserve Officers Training Corps (ROTC)</td>
<td>263</td>
</tr>
<tr>
<td>ROTC Band</td>
<td>269</td>
</tr>
<tr>
<td>Russian</td>
<td>252</td>
</tr>
<tr>
<td>Scholarship</td>
<td>47</td>
</tr>
<tr>
<td>Scholarships, Awards, Assistantships, Grants-in-Aid</td>
<td>57, 62, 75</td>
</tr>
<tr>
<td>School of Graduate Studies</td>
<td>70</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>132, 135</td>
</tr>
<tr>
<td>Secretarial Science</td>
<td>113</td>
</tr>
<tr>
<td>Snow College</td>
<td>42</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>49, 108, 124, 229</td>
</tr>
<tr>
<td>Social Work</td>
<td>126</td>
</tr>
<tr>
<td>Sociology</td>
<td>124</td>
</tr>
<tr>
<td>Soils</td>
<td>86, 87</td>
</tr>
<tr>
<td>Sororities</td>
<td>56</td>
</tr>
<tr>
<td>Southern Utah, College of</td>
<td>42</td>
</tr>
<tr>
<td>Spanish</td>
<td>261</td>
</tr>
<tr>
<td>Special Fees</td>
<td>53</td>
</tr>
<tr>
<td>Speech</td>
<td>255</td>
</tr>
<tr>
<td>Speech Clinic</td>
<td>67</td>
</tr>
<tr>
<td>Sponsor Corps Courses</td>
<td>269</td>
</tr>
<tr>
<td>Statistics, Applied</td>
<td>92</td>
</tr>
<tr>
<td>Statistics, Mathematical</td>
<td>249</td>
</tr>
<tr>
<td>Topic</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Student Activities</td>
<td>55</td>
</tr>
<tr>
<td>Student Employment</td>
<td>64</td>
</tr>
<tr>
<td>Student Government</td>
<td>56</td>
</tr>
<tr>
<td>Student Health Service</td>
<td>64</td>
</tr>
<tr>
<td>Student Housing</td>
<td>65</td>
</tr>
<tr>
<td>Student Loans</td>
<td>62, 67</td>
</tr>
<tr>
<td>Student Organizations</td>
<td>56</td>
</tr>
<tr>
<td>Student Publications</td>
<td>55</td>
</tr>
<tr>
<td>Student Services</td>
<td>54</td>
</tr>
<tr>
<td>Student Union</td>
<td>40</td>
</tr>
<tr>
<td>Summary of Attendance, 1956-57</td>
<td>278</td>
</tr>
<tr>
<td>Summer Camp, Forestry</td>
<td>200</td>
</tr>
<tr>
<td>Summer Camp, ROTC</td>
<td>267</td>
</tr>
<tr>
<td>Teacher Certification</td>
<td>131</td>
</tr>
<tr>
<td>Teacher Education</td>
<td>131</td>
</tr>
<tr>
<td>Teacher Placement Service</td>
<td>130</td>
</tr>
<tr>
<td>Teaching Assistantships</td>
<td>75</td>
</tr>
<tr>
<td>Technology Division</td>
<td>181</td>
</tr>
<tr>
<td>Terminal Certificate</td>
<td>50</td>
</tr>
<tr>
<td>Thesis</td>
<td>71</td>
</tr>
<tr>
<td>Textiles and Clothing</td>
<td>218</td>
</tr>
<tr>
<td>Theatricals</td>
<td>55</td>
</tr>
<tr>
<td>Tool Engineering</td>
<td>178</td>
</tr>
<tr>
<td>Trade and Industrial Education</td>
<td>189</td>
</tr>
<tr>
<td>Transfer Students</td>
<td>45</td>
</tr>
<tr>
<td>Tuition</td>
<td>52, 75</td>
</tr>
<tr>
<td>Union Building</td>
<td>40</td>
</tr>
<tr>
<td>University College</td>
<td>227</td>
</tr>
<tr>
<td>University, General Information on</td>
<td>37</td>
</tr>
<tr>
<td>Upper Division</td>
<td>49</td>
</tr>
<tr>
<td>Vegetable Crops</td>
<td>97</td>
</tr>
<tr>
<td>Veterans (see Admission)</td>
<td>44</td>
</tr>
<tr>
<td>Veterinary Science</td>
<td>102</td>
</tr>
<tr>
<td>Visitor’s Permit</td>
<td>46</td>
</tr>
<tr>
<td>Visual Aids</td>
<td>135</td>
</tr>
<tr>
<td>Visual Arts</td>
<td>137</td>
</tr>
<tr>
<td>Vocational Education</td>
<td>191</td>
</tr>
<tr>
<td>Welding</td>
<td>195</td>
</tr>
<tr>
<td>Wildlife Management</td>
<td>204</td>
</tr>
<tr>
<td>Withdrawal from Class</td>
<td>46</td>
</tr>
<tr>
<td>Woodwork and Building Construction</td>
<td>190</td>
</tr>
<tr>
<td>Zoology, Entomology, Physiology</td>
<td>259</td>
</tr>
</tbody>
</table>