AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

1954-55
1955-56

BULLETIN

OF THE

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

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ANNOUNCEMENTS FOR THE SESSIONS OF 1954-55 AND 1955-56

78

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COLLEGE 1954

SUMMER SESSION 1954

JUNE 1954

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

JULY 1954

S	M	T	W	T	F	S
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18	19	20	21	22	23	24
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AUGUST 1954

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

June 7, Monday
Registration for the first term, 8 a.m. to 12 noon.

June 8, Tuesday
Beginning of classes, 7 a.m.

June 10, Thursday
Last day for enrolling in the College for the first term.

June 11, Friday
Last day for making changes in registration.

July 5, Monday
A holiday.

July 16, Friday
First term final examinations.

July 19, Monday
Registration for second term, 8 a.m. to 12 noon.

July 20, Tuesday
Beginning of classes, 7 a.m.

July 22, Thursday
Last day for enrolling in the College for the second term.

July 23, Friday
Last day for making changes in registration.

August 27, Friday
Second term final examinations.

FALL SEMESTER 1954

SEPTEMBER 1954

S	M	T	W	T	F	S
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OCTOBER 1954

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31						

NOVEMBER 1954

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

September 10, Friday
Opening day of New Student Week.

September 17, Friday
Registration of new Basic Division students who have done no college work, 8 a.m. to 5 p.m.

September 18, Saturday
Registration of all other students, 8 a.m. to 5 p.m.

September 20, Monday
Beginning of classes, 8 a.m.

September 25, Saturday
Last day for enrolling in the College for the fall semester or for adding new courses.

October 2, Saturday
Last day for dropping courses with no grade.

November 6, Saturday
Official Corps trip.

November 15, Monday
Mid-semester grade reports.

November 25-28, Thursday-Sunday, inclusive
Thanksgiving holidays.

CALENDAR
1955

December 18, Saturday
Beginning of Christmas recess, 12 noon.

January 3, 1955, Monday
End of Christmas recess, 8 a.m.

January 24, Monday
First day of semester examinations.

January 29, Saturday
Last day of semester examinations.

DECEMBER 1954

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

SPRING SEMESTER 1955

February 2, Wednesday
Opening day of New Student Week.

February 4, Friday
Registration of new Basic Division students who have done no college work, 1 p m.

February 5, Saturday
Registration of all other students, 8 a.m. to 5 p.m.

February 7, Monday
Beginning of classes, 8 a.m.

February 12, Saturday
Last day for enrolling in the College for the spring semester or for adding new courses.

February 19, Saturday
Last day for dropping courses with no grade.

February 21, Monday
Beginning of Religious Emphasis Week.

February 25, Friday
End of Religious Emphasis Week.

April 4, Monday
Mid-semester grade reports.

April 6, Wednesday
Beginning of spring recess, 5 p.m.

April 12, Tuesday
End of spring recess, 8 a.m.

May 27, Friday
Commencement.

May 28, Saturday
Final Review.

May 30, Monday
First day of semester examinations.

June 4, Saturday
Last day of semester examinations.

JANUARY 1955

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30	31					

FEBRUARY 1955

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MARCH 1955

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APRIL 1955

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MAY 1955

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COLLEGE 1955

SUMMER SESSION 1955

JUNE 1955

S	M	T	W	T	F	S
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JULY 1955

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AUGUST 1955

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21	22	23	24	25	26	27
28	29	30	31			

June 6, Monday
Registration for the first term, 8 a.m. to 12 noon.

June 7, Tuesday
Beginning of classes, 7 a.m.

June 9, Thursday
Last day for enrolling in the College for the first term.

June 10, Friday
Last day for making changes in registration.

July 4, Monday
A holiday.

July 15, Friday
First term final examinations.

July 18, Monday
Registration for the second term, 8 a.m to 12 noon.

July 19, Tuesday
Beginning of classes, 7 a.m.

July 21, Thursday
Last day for enrolling in the College for the second term.

July 22, Friday
Last day for making changes in registration.

August 26, Friday
Second term final examinations.

FALL SEMESTER 1955

SEPTEMBER 1955

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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OCTOBER 1955

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NOVEMBER 1955

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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

September 9, Friday
Opening day of New Student Week.

September 16, Friday
Registration of new Basic Division students who have done no college work, 8 a.m. to 5 p.m.

September 17, Saturday
Registration of all other students, 8 a.m. to 5 p.m.

September 19, Monday
Beginning of classes, 8 a.m.

September 24, Saturday
Last day for enrolling in the College for the fall semester or for adding new courses.

October 1, Saturday
Last day for dropping courses with no grade.

October 15, Saturday
Official Corps trip.

November 12, Saturday
Official Corps trip.

November 14, Monday
Mid-semester grade reports.

CALENDAR
1956

November 24-27, Thursday-Sunday, inclusive
Thanksgiving holidays.

December 17, Saturday
Beginning of Christmas recess, 12 noon.

January 2, 1956, Monday
End of Christmas recess, 8 a.m.

January 23, Monday
First day of semester examinations.

January 28, Saturday
Last day of semester examinations

DECEMBER 1955

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

SPRING SEMESTER 1956

February 1, Wednesday
Opening day of New Student Week.

February 3, Friday
Registration of new Basic Division students who have done no college work, 1 p.m.

February 4, Saturday
Registration of all other students, 8 a.m. to 5 p.m.

February 6, Monday
Beginning of classes, 8 a.m.

February 11, Saturday
Last day for enrolling in the College for the spring semester or for adding new courses.

February 18, Saturday
Last day for dropping courses with no grade.

February 20, Monday
Beginning of Religious Emphasis Week.

February 24, Friday
End of Religious Emphasis Week.

March 28, Wednesday
Beginning of spring recess, 5 p.m.

April 3, Tuesday
End of spring recess, 8 a.m.

April 4, Wednesday
Mid-semester grade reports.

May 25, Friday
Commencement.

May 26, Saturday
Final Review.

May 28, Monday
First day of semester examinations.

June 2, Saturday
Last day of semester examinations.

JANUARY 1956

S	M	T	W	T	F	S
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FEBRUARY 1956

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MARCH 1956

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18	19	20	21	22	23	24
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MAY 1956

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

The Texas Agricultural and Mechanical College System

Composed of all colleges, agencies and services under the supervision of the Board of Directors of the Agricultural and Mechanical College of Texas, including:

The Agricultural and Mechanical College of Texas
The Arlington State College
The Tarleton State College
The Prairie View Agricultural and Mechanical College
The Texas Agricultural Experiment Station
The Texas Agricultural Extension Service
The Texas Forest Service
The Texas Engineering Experiment Station
The Texas Engineering Extension Service

Board of Directors

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J. W. WITHERSPOON, *Attorney* ..... Hereford
ROBERT ALLEN, *Farmer and Shipper* ..... Raymondville
W. T. DOHERTY, *Petroleum Engineer* ..... Houston
J. HAROLD DUNN, *Industrial Executive* ..... Amarillo
R. H. FINNEY, *Business Executive* ..... Greenville

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M. T. HARRINGTON ..... *Chancellor*
D. W. WILLIAMS ..... *Vice-Chancellor for Agriculture*
E. L. ANGELL ..... *Assistant Chancellor and Secretary of the Board*
R. H. SHUFFLER ..... *Director of Information and Publications*
W. C. FREEMAN ..... *Comptroller*
T. R. SPENCE ..... *Manager of Physical Plants*

The Agricultural and Mechanical College of Texas
Administrative Officers

DAVID H. MORGAN, PH.D. ..... *President*

JOHN PAUL ABBOTT, PH.D. ..... *Dean of the College*

HOWARD W. BARLOW, ENG.SC.D. ..... *Dean, School of Engineering*

CHARLES N. SHEPARDSON, M.S. ..... *Dean, School of Agriculture*

W. W. ARMISTEAD, D.V.M., M.S. ..... *Dean, School of Veterinary Medicine*

WALTER H. DELAPLANE, PH.D. ..... *Dean, School of Arts and Sciences*

IDE P. TROTTER, PH.D. ..... *Dean, Graduate School*

JOHN R. BERTRAND, PH.D. ..... *Dean, Basic Division*

WALTER L. PENBERTHY, B.S. ..... *Dean of Men*

JOE E. DAVIS, B.S., Colonel, Inf., U.S.A.R. ..... *Commandant and Coordinator of the School of Military Science*

H. LLOYD HEATON, M.S. ..... *Registrar, Secretary of the Academic Council*

CHARLES A. ROEBER, B.A., B.B.A. ..... *Auditor*

ROBERT A. HOUZE, B.S., B.L.S. ..... *Librarian*

J. E. MARSH, B.A., M.D. ..... *College Physician*

W. HOWARD BADGETT, M.S. ..... *Manager, Physical Plants*

FACULTY

(Correct as of December 10, 1953)

ACADEMIC COUNCIL

(Figures in parenthesis indicate date of first appointment on the College Staff and date of appointment to present position respectively.)

Morgan, David Hitchens, President of the College. (1952, 1953)

Abbott, John Paul, Dean of the College. (1926, 1953)

Heaton, Homer Lloyd, Registrar and Secretary of the Academic Council. (1934, 1945)

Adams, James Edward, Professor of Agronomy. (1946)

Adriance, Guy Webb, Professor of Horticulture. (1921, 1935)

Armistead, Willis William, Dean of the School of Veterinary Medicine. (1940, 1953)

Barlow, Howard Walter, Dean of the School of Engineering. (1940, 1944)

Bertrand, John Raney, Dean of the Basic Division. (1946, 1950)

Brush, Edward E., Professor of Aeronautical Engineering. (1947)

*Bryant, Paul William, Athletic Director. (1954)

Burchard, Donald Dix, Professor of Journalism. (1948)

Burgess, Archie Rostron, Professor of Industrial Engineering. (1948, 1950)

Burns, Patton Wright, Professor of Veterinary Physiology and Pharmacology. (1926, 1935)

Crawford, Charles William, Professor of Mechanical Engineering. (1919, 1929)

Davis, Joe Eugene, Colonel, Inf., U.S.A.R., Coordinator and Commandant of the School of Military Science. (1930, 1951)

Davis, William B., Professor of Wildlife Management. (1937, 1946)

Delaplane, John Paul, Professor of Veterinary Bacteriology and Hygiene. (1950)

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*Effective February 8, 1954.

Delaplane, Walter Harold, Dean of the School of Arts and Sciences and Professor of Economics. (1948, 1953)

DeWerth, Adolphe Ferdinand, Professor of Floriculture and Landscape Architecture. (1946, 1949)

Doak, Clifton Childress, Professor of Biology. (1926, 1937)

Gaines, J. C., Professor of Entomology. (1947, 1952)

Gammon, Samuel Rhea, Professor of History. (1925)

Godbey, Chauncey Barger, Professor of Genetics. (1926, 1946)

Groneman, Chris Harold, Professor of Industrial Education. (1940, 1942)

Houze, Robert Alvin, Librarian. (1949, 1951)

Hughes, Martin Collins, Professor of Electrical Engineering. (1923, 1932)

Jensen, Frederick William, Professor of Chemistry. (1926, 1947)

Jones, Fred Rufus, Professor of Agricultural Engineering. (1921, 1940)

Klipple, Edmund Chester, Professor of Mathematics. (1935, 1952)

Langford, Ernest, Professor of Architecture. (1915, 1929)

Leipper, Dale F., Professor of Oceanography. (1949)

Leland, Thomas William, Professor of Business Administration. (1922, 1926)

Lenert, August Albert, Professor of Veterinary Medicine and Surgery. (1919, 1937)

Lindsay, James Donald, Professor of Chemical Engineering. (1938, 1946)

Lyman, Carl M., Professor of Biochemistry and Nutrition. (1949)

Lynch, Shirley Alfred, Professor of Geology. (1946)

Miller, James C., Professor of Animal Husbandry. (1940, 1947)

Milliff, John Henry, Professor of Veterinary Anatomy. (1936, 1941)

Morgan, Stewart Samuel, Professor of English. (1921, 1952)

Myers, Shelly Prusher, Jr., Colonel, Professor of Military Science and Tactics. (1949, 1951)

Penberthy, Walter Lawren, Dean of Men. (1926, 1947)

Potter, James Gregor, Professor of Physics. (1945)

Quisenberry, John Henry, Professor of Poultry Husbandry. (1936, 1946)

Rupel, Isaac Walker, Professor of Dairy Husbandry. (1945)

Schlesselman, George Wilhelm, Professor of Geography. (1934, 1945)

Shepardson, Charles Noah, Dean of the School of Agriculture. (1928, 1944)

Smith, Hilton Atmore, Professor of Veterinary Pathology. (1949)

Stevens, Albert Byron, Professor of Petroleum Engineering. (1934, 1953)

Street, William Ezra, Professor of Engineering Drawing. (1941)

Timm, Tyrus Raymond, Professor of Agricultural Economics and Sociology. (1947, 1953)

Tishler, Carl Edward, Professor of Physical Education. (1941, 1947)

Trotter, Ide Peebles, Dean of the Graduate School. (1936, 1949)

Turk, Richard Duncan, Professor of Veterinary Parasitology. (1944)

Walton, Ernest Vernon, Professor of Agricultural Education. (1946, 1953)

Watkins, Gustav McKee, Professor of Plant Physiology and Pathology. (1949, 1950)

Way, John Allen, Colonel, Professor of Air Science and Tactics. (1952)

Wilcox, George Barton, Professor of Education. (1920, 1945)

Woolket, Joseph John, Professor of Modern Languages. (1925, 1945)

Wright, Samuel Robert, Professor of Civil Engineering. (1923, 1946)

Young, Vernon Alphus, Professor of Range and Forestry. (1929, 1946)

GENERAL FACULTY

(Figures in parentheses indicate date of first appointment on the College Staff and date of appointment to present position respectively.)

Abbott, John Paul, Dean of the College. (1926, 1953)
B.A., Vanderbilt, 1925; Ph.D., Iowa, 1939.

Abrams, Morris Newton, Associate Professor of Agricultural Education. (1950)
B.S., Louisiana State, 1940; M.S., 1947; Ph.D., 1950.

Abramson, Hyman Norman, Acting Associate Professor of Aeronautical Engineering. (1952)
B.S., Leland Stanford, 1949; M.S., 1951.

Adams, Ira Gillispie, Professor of Economics. (1927, 1935)
A.B., Evansville College, 1923; A.M., Minnesota, 1927.

Adams, James Edward, Professor of Agronomy and Head of Department. (1946)
A.B., William Jewell College, 1920; M.S., Purdue, 1922; Ph.D., Iowa State College, 1936.

Adams, William Floyd, Associate Professor of Engineering Drawing. (1944, 1953)
B.S., Agricultural and Mechanical College of Texas, 1923.

Adamson, Arthur Douglas, Professor of Physical Education. (1939, 1949)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1944.

Adriance, Guy Webb, Professor of Horticulture and Head of Department. (1921, 1935)
B.S., Agricultural and Mechanical College of Texas, 1915; M.S., California, 1917; Ph.D., Michigan State College, 1929.

Aldred, William Hughes, Instructor of Agricultural Engineering. (1953)
B.S., Georgia, 1951.

Alexander, Don Beryl, Instructor of Mathematics. (1952)
B.A., North Texas State College, 1951; M.S., 1952.

Alexander, Robert Benjamin, Instructor of Chemistry. (1952)
B.A., Baylor, 1945; M.A., 1946.

Alter, Alan Brian, Assistant Professor of Mechanical Engineering. (1949, 1952)
B.S., Pittsburgh, 1948; M.S., Agricultural and Mechanical College of Texas, 1953.

Amyx, James William, Assistant Professor of Petroleum Engineering. (1953)
B.S., Agricultural and Mechanical College of Texas, 1946.

Anderson, John Quincey, Instructor of English. (1953)
A.B., Oklahoma Agricultural and Mechanical College, 1939; M.A., Louisiana State, 1948; Ph.D., North Carolina, 1952.

Andrew, Edward Harris, Jr., Assistant Professor of Electrical Engineering. (1947, 1952)
B.S., Agricultural and Mechanical College of Texas, 1947; S.M., Massachusetts Institute of Technology, 1950; Reg. Prof. Eng.

Andrews, Paul Milton, Associate Professor of Physical Education. (1943, 1951)
B.S., Sul Ross State Teachers College, 1934; M.Ed., Agricultural and Mechanical College of Texas, 1945.

Andrews, Robert Vincent, Associate Professor of Chemical Engineering. (1940, 1951)
B.S., Oregon State College, 1938; M.S., Agricultural and Mechanical College of Texas, 1940; Ph.D., 1952; Reg. Prof. Eng.

Armistead, Willis William, Dean of the School of Veterinary Medicine. (1940, 1953)
D.V.M., Agricultural and Mechanical College of Texas, 1938; M.S., Ohio State, 1950.

Bailey, Kenneth Ralph, Instructor of Mathematics. (1946)
B.A., Texas, 1937; M.A., 1941.

Baker, Donald Craig, Instructor of English. (1953)
A.B., Arkansas State College, 1949; M.A., Mississippi, 1950.

Baldauf, Richard John, Instructor of Biology. (1952)
B.S., Albright College, 1949; M.S., Agricultural and Mechanical College of Texas, 1951.

Banks, William Carl, Associate Professor of Veterinary Radiology. (1941, 1953)
D.V.M., Agricultural and Mechanical College of Texas, 1941; M.S., 1952.

Bardell, North Bruce, Jr., Instructor of Engineering Drawing. (1953)
B.S., Agricultural and Mechanical College of Texas, 1953.

Barger, Justus Wheeler, Professor of Agricultural Economics. (1929)
B.S., Kansas State College, 1922; M.S., 1923; M.A., Leland Stanford, 1929.

Barker, Palmer Winfield, Associate Professor of Physics. (1946, 1949)
B.S., Missouri, 1932; M.A., 1933.

Barlow, Howard Walter, Dean of the School of Engineering and Director of the Engineering Experiment Station. (1940, 1944)
B.S., Purdue, 1927; M.S., Minnesota, 1934; Eng.Sc.D., New York, 1941; Reg. Prof. Eng.

Barlow, John Peleg, Assistant Professor of Biological Oceanography. (1953)
B.S., Rhode Island, 1941; M.A., Harvard, 1948; Ph.D., 1952.

Bass, James Horace, Associate Professor of History. (1940, 1945)
B.A., North Texas State Teachers College, 1924; M.A., Texas, 1931; Ph.D., 1933.

Basye, Robert Eugene, Professor of Mathematics. (1940, 1952)
B.A., Missouri, 1929; M.A., Princeton, 1931; Ph.D., Texas, 1933.

Baty, James Bernard, Professor of Civil Engineering. (1948, 1950)
B.S., Agricultural and Mechanical College of Texas, 1925; M.S., Cornell, 1950; Reg. Prof. Eng.

Beamer, Russell James, Lecturer in Veterinary Medicine and Surgery. (1954)
D.V.M., Iowa State College, 1940.

Bebout, Harley, Assistant Professor of Agricultural Economics. (1939, 1942)
B.S., Missouri, 1925; M.S., Agricultural and Mechanical College of Texas, 1939.

Beckham, John Blair, Instructor of Chemistry. (1946)
A.B., Daniel Baker College, 1936; B.S., 1937; M.S., Agricultural and Mechanical College of Texas, 1950.

Bell, Roy Chester, Instructor of Physical Education. (1952)
B.S., Agricultural and Mechanical College of Texas, 1931; M.Ed., 1952.

Bell, Rurel Roger, Instructor of Veterinary Parasitology. (1952)
D.V.M., Georgia, 1952.

Benson, Fred Jacob, Professor of Civil Engineering. (1937, 1947)
B.S., Kansas State College, 1935; M.S., Agricultural and Mechanical College of Texas, 1936; Reg. Prof. Eng.

Bents, Ulrich H., Instructor of Physics. (1952)
B.S., River Falls State College, 1940; M.S., Arizona, 1950.

Bernard, Cicero Henry, Associate Professor of Physics. (1941, 1947)
A.B., Phillips, 1928; M.S., Kentucky, 1931.
(On leave of absence)

Berry, Raymond Orville, Professor of Animal Husbandry. (1931, 1950)
B.S., North Texas State Teachers College, 1928; M.S., Agricultural and Mechanical College of Texas, 1932; Ph.D., Johns Hopkins, 1939.

Bertrand, Clint Albert, Instructor of Industrial Education. (1953)
B.S., Agricultural and Mechanical College of Texas, 1953.

Bertrand, John Raney, Dean of the Basic Division. (1946, 1950)
B.S., Texas Technological College, 1940; M.S., 1941; Ph.D., Cornell, 1950.

Birkner, John Francis, Major, Associate Professor of Military Science and Tactics. (1953)
B.A., The Citadel, 1942.

Bishop, Francis Frederick, Professor of Chemical Engineering. (1923, 1941)
B.S., Clarkson College of Technology, 1922; M.S., 1928; Reg. Prof. Eng.

Blackburn, Thomas Anthony, Assistant Professor of Veterinary Pathology. (1953)
A.B., Cornell, 1947; B.S., Michigan State College, 1952; D.V.M., 1953.

Blackhurst, Homer T., Associate Professor of Horticulture. (1947)
A.B., Glenville State Teachers College, 1935; M.S., Agricultural and Mechanical College of Texas, 1940; Ph.D., 1947.

Blank, Horace R., Professor of Geology. (1949, 1953)
B.S., Pennsylvania, 1919; Ph.D., 1924.

Bloom, Francis James, Captain, Assistant Professor of Military Science and Tactics. (1953)
B.J., Missouri, 1941.

Bolton, Frank Cleveland, Professor of Electrical Engineering and President Emeritus of the College. (1909, 1950)
B.S., Mississippi State College, 1905; M.S., Ohio State, 1928; LL.D., Austin College, 1932; LL.D., Agricultural and Mechanical College of Texas, 1951.

Boney, William Arthur, Associate Professor of Veterinary Bacteriology and Hygiene. (1949)
B.S., Agricultural and Mechanical College of Texas, 1940; D.V.M., 1942; M.S., 1948.

Boone, James Leroy, Jr., Instructor of Industrial Education. (1952)
B.S., Agricultural and Mechanical College of Texas, 1947; M.Ed., 1948.

Boriskie, Ben Bernard, Assistant Professor of Physics. (1941, 1948)
B.S., Agricultural and Mechanical College of Texas, 1936; M.S., 1948.

Boughton, Ivan Bertrand, Professor of Veterinary Pathology. (1948, 1953)
D.V.M., Ohio State, 1916.

Breitenkamp, Edward Carlton, Assistant Professor of Modern Languages. (1953)
B.A., Drake, 1936; M.A., 1938; Ph.D., Iowa State, 1951.

Brewer, Alexander Van, Professor of Mechanical Engineering. (1922, 1930)
B.S., Purdue, 1913; M.E., 1925; M.S., Agricultural and Mechanical College of Texas, 1937; Reg. Prof. Eng.

Briles, Worthie Elwood, Associate Professor of Poultry Husbandry. (1948, 1951)
B.A., Texas, 1941; Ph.D., Wisconsin, 1948.

Brison, Fred Robert, Professor of Horticulture. (1926, 1938)
B.S., Agricultural and Mechanical College of Texas, 1921; M.S., Michigan State College, 1931.

Brock, Eugene H., Associate Professor of Engineering Drawing. (1941), 1946)
B.A., Texas Technological College, 1936; M.S., Agricultural and Mechanical College of Texas, 1945; Reg. Prof. Eng.

Brooks, Melvin S., Associate Professor of Rural Sociology. (1941, 1947)
B.A., Washington State College, 1935; M.S., Iowa State College, 1937; Ph.D., Wisconsin, 1941.

Brooks, Thomas Dudley, Professor of Education and Dean Emeritus of the Graduate School. (1932, 1947)
A.B., Baylor, 1903; A.M., Chicago, 1920; Ph.D., 1921.

Brown, Charles H., Major, Associate Professor of Military Science and Tactics. (1953)
B.S., Clemson Agricultural College, 1943.

Brown, Eugene Cornelius, Jr., Instructor of Agricultural Engineering. (1952)
B.S., Agricultural and Mechanical College of Texas, 1951.

Brown, Stewart Ellsworth, Instructor of Mechanical Engineering. (1951)

Brown, Sidney Overton, Professor of Biology. (1936, 1949)
B.A., Texas, 1932; Ph.D., 1936.

Bruckart, Richard F., Associate Professor of Industrial Engineering. (1949, 1952)
B.S., Pennsylvania State College, 1940; M.S., Agricultural and Mechanical College of Texas, 1952; Reg. Prof. Eng.

Brush, Edward E., Professor of Aeronautical Engineering and Head of Department. (1947)
B.S., New York, 1935.

Buchanan, Spencer Jennings, Professor of Civil Engineering. (1946)
B.S., Agricultural and Mechanical College of Texas, 1926; M.S., Massachusetts Institute of Technology, 1931; C.E., Agricultural and Mechanical College of Texas, 1948; Reg. Prof. Eng.

Burchard, Donald Dix, Professor of Journalism and Head of Department. (1948)
A.B., Beloit College, 1925; A.M., Missouri, 1938.

Burgess, Archie Rostron, Professor of Industrial Engineering and Head of Department. (1948, 1951)
B.S., Washington, 1932; M.S., 1938; Reg. Prof. Eng.

Burkhalter, Thomas S., Assistant Professor of Chemistry. (1952)
B.S., Oklahoma, 1947; M.S., 1948; Ph.D., Louisiana State, 1950.

Burns, Patton Wright, Professor of Veterinary Physiology and Pharmacology and Head of Department. (1926, 1935)
B.S., Agricultural and Mechanical College of Texas, 1923; D.V.M., 1926.

Burt, Waldo Francis, Major, Associate Professor of Air Science and Tactics. (1952)
B.B.A., Houston, 1949.

Butler, Marvin Harold, Assistant Professor of Economics. (1948)
A.B., McKendree College, 1940; M.A., Illinois, 1948.

Butler, Ogbourne Duke, Jr., Associate Professor of Animal Husbandry. (1947, 1953)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1947; Ph.D., Michigan State College, 1953.

*Bryant, Paul William, Athletic Director. (1954)
B.S., Alabama, 1936.

Caddess, James Harvey, Associate Professor of Mechanical Engineering. (1940, 1953)
B.S., Agricultural and Mechanical College of Texas, 1932; M.S., 1934; Reg. Prof. Eng.

Campbell, Joe Riley, Associate Professor of Agricultural Economics. (1948)
B.S., Agricultural and Mechanical College of Texas, 1938; M.S., Louisiana State, 1940; Ph.D., Cornell, 1948.

*Effective February 8, 1954.

Carlson, David Edward, Associate Professor of Industrial Engineering. (1947)
B.S., United States Naval Academy, 1921; M.S., Columbia, 1930.

Chalk, Alfred Franklin, Professor of Economics. (1936, 1951)
B.A., Baylor, 1934; M.S., Agricultural and Mechanical College of Texas, 1936; Ph.D., Texas, 1950.

Chenoweth, Robert Dean, Assistant Professor of Electrical Engineering. (1947, 1952)
B.S., Agricultural and Mechanical College of Texas, 1946; M.S., 1951.
(On leave of absence)

Cleland, Samuel Miles, Associate Professor of Engineering Drawing. (1941, 1950)
B.A., West Texas State Teachers College, 1931; M.Ed., Agricultural and Mechanical College of Texas, 1940.

Cofer, David Brooks, Professor of English and Archivist. (1910, 1950)
A.B., Centre College, 1907; M.A., Wisconsin, 1927.

Coffman, Moody Lee, Instructor of Mathematics. (1951, 1953)
B.A., Abilene Christian College, 1947; M.A., Oklahoma, 1949; M.S., 1949.

Collins, Royal Eugene, Instructor of Mathematics. (1953)
B.S., Houston, 1949; M.S., Agricultural and Mechanical College of Texas, 1950.

Cook, Benjamin Davy, Assistant Professor of Agricultural Education and Assistant to the Dean of Agriculture. (1950)
B.S., Agricultural and Mechanical College of Texas, 1934; M.Ed., 1950.

Coon, Jesse Bryan, Associate Professor of Physics. (1946)
A.B., Indiana, 1932; M.A., 1935; Ph.D., Chicago, 1949.

Couch, James Russell, Professor of Biochemistry and Nutrition and of Poultry Husbandry. (1948, 1949)
B.S., Agricultural and Mechanical College of Texas, 1931; M.S., 1934; Ph.D., Wisconsin, 1948.

CoVan, Jack Phillip, Associate Professor of Industrial Engineering. (1946)
B.M.E., Ohio State, 1935; B.I.E., 1935; M.S., Illinois, 1942; Reg. Prof. Eng.

Cowart, Robert Page, Captain, Assistant Professor of Air Science and Tactics. (1951)
B.S., Virginia Polytechnic Institute, 1943; M.S., Michigan, 1947.

Cox, Sidney Saunders, Assistant Professor of English. (1948, 1952)
B.A., Southwest Texas State Teachers College, 1932; M.A., 1939.

Craig, Robert Neal, Assistant Professor of Agricultural Engineering. (1940, 1946)
B.S., Agricultural and Mechanical College of Texas, 1937.

Crawford, Charles William, Professor of Mechanical Engineering and Head of Department. (1919, 1929)
B.S., Agricultural and Mechanical College of Texas, 1919; M.S., 1929; Reg. Prof. Eng.

Creswell, Horace Staley, Assistant Professor of English. (1946, 1951)
B.S., Texas Technological College, 1935; M.A., Texas Christian, 1938.

Curtis, Howard Benton, Jr., Instructor of Mathematics. (1950)
B.S., Oklahoma, 1946; M.A., Arkansas, 1948.

Dabbs, Jack Autrey, Associate Professor of Modern Languages. (1950, 1953)
B.A., Texas, 1935; M.A., 1936; Ph.D., 1950.

Dahlberg, Frank Iver, Professor of Animal Husbandry. (1936, 1947)
B.S., Agricultural and Mechanical College of Texas, 1925; M.S., Wisconsin, 1930.

Daniels, Marion Gordon, Instructor of Economics. (1953)
A.B., Doane College, 1947; M.A., Texas, 1949.

Darnell, Albert Laurie, Professor of Dairy Husbandry. (1914, 1925)
B.S., Mississippi State College, 1914; M.A., Missouri, 1916.

Darrow, Robert Arthur, Professor of Range and Forestry. (1948, 1951)
B.S., New York State College of Forestry, 1932; M.S., Arizona, 1935; Ph.D., Chicago, 1937.

Daum, John Andrew, Professor of Mathematics. (1940, 1952)
B.S., Creighton, 1934; M.S., 1936; Ph.D., Nebraska, 1941.
(On leave of absence)

Davids, Lewis Edmund, Professor of Business Administration. (1951)
B.S., New York, 1941; M.B.A., 1942; Ph.D., 1949.

Davis, Daniel Rowland, Associate Professor of Rural Sociology. (1935, 1947)
B.S., Agricultural and Mechanical College of Texas, 1932; M.S., 1935.

Davis, James Allen, Instructor of Architecture. (1950)
B.Arch., Agricultural and Mechanical College of Texas, 1950.

Davis, Joe Eugene, Colonel, Commandant and Coordinator of the School of Military Science and Tactics. (1930, 1951)
B.S., Agricultural and Mechanical College of Texas, 1930.

Davis, John Peter, Jr., Instructor of Veterinary Medicine and Surgery. (1953)
B.S., Agricultural and Mechanical College of Texas, 1952; D.V.M., 1953.

Davis, James Willard, Major, Associate Professor of Military Science and Tactics. (1951)
B.S., Virginia Polytechnic Institute, 1939.

Davis, Richard Harvey, Jr., Assistant Professor of Veterinary Physiology and Pharmacology. (1951)
D.V.M., Agricultural and Mechanical College of Texas, 1941.

Davis, William B., Professor of Wildlife Management and Head of Department. (1937, 1946)
B.A., Chico State Teachers College, 1933; M.A., California, 1936; Ph.D., 1937.

Davis, Wilbur Claude, Instructor of Business Administration. (1948)
LL.B., Baylor, 1948.

Delaplane, John Paul, Professor of Veterinary Bacteriology and Hygiene and Head of Department. (1950)
D.V.M., Ohio State, 1929; M.S., 1931.

Delaplane, Walter Harold, Dean of the School of Arts and Sciences, Professor of Economics and Head of Department. (1948, 1953)
A.B., Oberlin College, 1929; A.M., 1931; Ph.D., Duke, 1934.

Denison, John Scott, Assistant Professor of Electrical Engineering. (1949, 1951)
B.S., New Mexico Agricultural and Mechanical College, 1948; M.S., Agricultural and Mechanical College of Texas, 1949; Reg. Prof. Eng.

Denton, Allen Eugene, Jr., Instructor, Basic Division. (1951)
B.A., Agricultural and Mechanical College of Texas, 1948; M.Ed., 1949.

DeVilbiss, Cecil Floyd, Assistant Professor of Civil Engineering. (1946)
B.S., Agricultural and Mechanical College of Texas, 1941; M.Eng., 1950; Reg. Prof. Eng.

DeWerth, Adolphe Ferdinand, Professor of Floriculture and Landscape Architecture and Head of Department. (1946, 1949)
B.S., Ohio State, 1930; M.S., 1931.

Dickson, Cecil Herman, Instructor of Chemistry. (1948)
B.S., Agricultural and Mechanical College of Texas, 1948.

Dillingham, Harley Clay, Professor of Electrical Engineering. (1922, 1930)
B.S., Agricultural and Mechanical College of Texas, 1922; A.M., Columbia, 1930; Reg. Prof. Eng.

Dillon, Lawrence Samuel, Assistant Professor of Biology. (1948, 1951)
B.S., Pittsburgh, 1933; M.S., Agricultural and Mechanical College of Texas, 1950.

Dixon, Keith Lee, Assistant Professor of Wildlife Management. (1952)
A.B., San Diego State College, 1943; M.S., California, 1948; Ph.D., 1953.

Doak, Clifton Childress, Professor of Biology and Head of Department. (1926, 1937)
B.S., North Texas State Teachers College, 1922; M.S., Agricultural and Mechanical College of Texas, 1928; Ph.D., Illinois, 1933.

Dobson, William Jackson, Associate Professor of Biology. (1947, 1950)
B.A., Austin College, 1939; Ph.D., Texas, 1946.

Doleac, Cyril Bartholmew, Captain, Assistant Professor of Air Science and Tactics. (1952)
B.A., Southeastern Louisiana College, 1947.

Dowell, William Merl, Professor of Physical Education. (1942, 1950)
B.S., Sam Houston State Teachers College, 1929; M.A., George Peabody College, 1932.

Downard, Richard Walter, Assistant Professor of Mechanical Engineering. (1913, 1939)

Druce, Albert John, Assistant Professor of Electrical Engineering. (1946, 1951)
B.S., Agricultural and Mechanical College of Texas, 1943; M.S., 1950.

DuBose, Lawrence Addison, Assistant Professor of Civil Engineering. (1948, 1951)
B.S., Agricultural and Mechanical College of Texas, 1942; M.S., 1948; Reg. Prof. Eng.

Duller, Nelson Mark, Assistant Professor of Physics. (1953)
B.S., Agricultural and Mechanical College of Texas, 1948; Ph.D., Rice Institute, 1953.

Duncan, John Thomas, Assistant Professor of History. (1943, 1951)
B.A., Simmons College, 1924; M.A., Texas Technological College, 1942.

Durst, Nelson Daniel, Professor of Business Administration. (1939, 1944)
B.A., Southwestern, 1936; B.B.A., 1937; M.S., Agricultural and Mechanical College of Texas, 1939; C.P.A., 1940.

Ebbs, John Dale, Instructor of English. (1950)
B.A., North Carolina, 1948; M.A., 1949.

Edmiston, Richard Munson, Instructor of Mechanical Engineering. (1953)
B.S., Agricultural and Mechanical College of Texas, 1949.

Eidemiller, Donald Irwin, Assistant Professor of Geography. (1949)
B.S., San Diego State College, 1943; M.A., California, 1948.

Eisner, Melvin, Associate Professor of Physics. (1948)
B.A., Brooklyn College, 1942; M.S., North Carolina, 1947; Ph.D., 1948.

Ekfelt, Fred Emil, Professor of English. (1938, 1951)
B.A., Iowa, 1931; M.A., 1932; Ph.D., 1941.

Eldridge, Herbert Garfield, Jr., Instructor of English. (1950)
B.A., Pennsylvania, 1949; M.A., 1950.
(On leave of absence)

Elkins, Rollin Lafayette, Associate Professor of Business Administration. (1935, 1946)
B.S., Agricultural and Mechanical College of Texas, 1933; M.S., 1935.

Elliott, William P., Instructor of Oceanography. (1953)
A.B., St. John's College, 1947; S.M., Chicago, 1952.

Elmquist, Karl Erik, Associate Professor of English. (1935, 1947)
A.B., Southern Methodist, 1932; M.A., Texas, 1939.

Emerson, Edwin W., Major, Associate Professor of Military Science and Tactics. (1952)
B.S., Montana State, 1943.

Esten, Clarence Kenyon, Assistant Professor of English. (1946, 1951)
A.B., Baylor, 1931; M.A., 1949.

Farrar, W. Fred, Professor of Business Administration. (1946, 1950)
B.A., Louisiana Polytechnic Institute, 1932; M.B.A., Texas, 1937.

Feragen, Robert White, Instructor of English. (1952)
B.A., Iowa State, 1950; M.A., 1952.

Ferguson, Thomas Morgan, Assistant Professor of Biology. (1946, 1948)
B.A., Southwestern, 1936; M.S., Agricultural and Mechanical College of Texas, 1946.
(On leave of absence)

Ferrell, Wilfred Anderson, Instructor of English. (1952)
B.A., Texas, 1951; M.A., 1952.

Files, Carl Winfred, Associate Professor of Mechanical Engineering. (1941, 1949)
B.S., Iowa State College, 1939; M.S., Agricultural and Mechanical College of Texas, 1949.
(On leave of absence)

Finlay, Albert Edward, Associate Professor of Mathematics. (1929, 1948)
B.S., Peabody College, 1929; M.A., 1929.

Fitch, David R., Associate Professor of Business Administration. (1949)
B.A., Agricultural and Mechanical College of Texas, 1942; M.S., Wisconsin, 1948.

Fleming, David Winston, Associate Professor of Mechanical Engineering. (1927, 1945)
B.S., Agricultural and Mechanical College of Texas, 1930; M.Ed., 1942.

Fletcher, Robert Holton, Assistant Professor of Mechanical Engineering. (1947, 1950)
B.S., Pennsylvania State College, 1928; Reg. Prof. Eng.

Flowers, William Baker, Instructor of Business Administration. (1949)
B.S., Alabama, 1943; M.S., 1949.

Foth, Henry Donald, Associate Professor of Agronomy. (1952)
B.S., Wisconsin, 1943; M.S., 1948; Ph.D., Iowa State College, 1952.

Franks, Orlan Henry, Major, Associate Professor of Air Science and Tactics. (1952)
B.S., Stephen F. Austin State College, 1949.

Freeman, John C., Jr., Assistant Professor of Oceanography. (1953)
B.A., Rice Institute, 1941; M.S., California Institute of Technology, 1942; Ph.D., Chicago, 1952.

Gabbard, Letcher P., Professor of Agricultural Economics. (1947)
B.S.A., Tennessee, 1915; M.S., Wisconsin, 1921.

Gaddis, Alvis Mathew, Assistant Professor of Mechanical Engineering. (1942, 1946)
A.B., Austin College, 1930.

Gaines, J. C., Professor of Entomology and Head of Department. (1947, 1952)
B.S., Alabama Polytechnic Institute, 1925; M.S., 1926; Ph.D., Iowa State College, 1937.

Gallaway, Bob Mitchel, Assistant Professor of Civil Engineering. (1944, 1946)
B.S., Agricultural and Mechanical College of Texas, 1943; M.S., 1946; Reg. Prof. Eng.

Gammon, Samuel Rhea, Professor of History and Head of Department. (1925)
A.B., Washington and Lee, 1911; M.A., 1913; Ph.D., Johns Hopkins, 1921.

Garber, Morris Joseph, Assistant Professor of Genetics. (1947, 1951)
B.S., Columbia, 1933; Ph.D., Agricultural and Mechanical College of Texas, 1951.

Garrett, Roy Curtis, Associate Professor of Agricultural Engineering. (1944, 1951)
B.S., Agricultural and Mechanical College of Texas, 1938; M.S., 1949; Reg. Prof. Eng.

Gee, Lynn LaMarr, Professor of Bacteriology. (1948)
A.B., Brigham Young, 1935; M.S., Colorado State College, 1937; Ph.D., Wisconsin, 1941.

George, Clay Edwin, Reading Clinician and Instructor, Basic Division. (1953)
B.S., Arizona State College, 1949; M.A., Arizona, 1953.

Gibbons, Eldred Harris, Associate Professor of Biology. (1925, 1939)
B.S.A., Tennessee, 1925; S.M., Chicago, 1929.

Gibbs, Leon Wilford, Assistant Professor of Veterinary Anatomy. (1949, 1951)
B.S., Agricultural and Mechanical College of Texas, 1939; D.V.M., 1949.

Gibson, Roy Howard, Instructor of Mechanical Engineering. (1933, 1947)

Gimbrede, Louis de Agramonte, Assistant Professor of Geology. (1952)
A.B., Cornell, 1939; M.A., Texas, 1951.

Glaser, Arnold Henry, Assistant Professor of Oceanography. (1953)
B.S., Washington, 1940; M.S., 1941; Sc.D., Massachusetts Institute of Technology, 1952.

Godbey, Chauncey Barger, Professor of Genetics and Head of Department. (1926, 1946)
B.S., Kentucky, 1925; M.S., Agricultural and Mechanical College of Texas, 1926.

Goedicke, Thomas Robert, Assistant Professor of Geology. (1951)
B.S., McGill, 1945; M.S., North Carolina State College, 1948.

Goellner, William A., Instructor of Physical Education. (1953)
B.S., Ohio State, 1938; M.A., Western Reserve, 1943.

Goode, Phillip Barron, Professor of Business Administration. (1946, 1949)
B.S., Southern Methodist, 1933; LL.B., 1936; LL.M., Texas, 1953.

Gooding, Harry Wilmont, Instructor of Architecture. (1953)
B.Arch., Agricultural and Mechanical College of Texas, 1949; Reg. Prof. Arch.

Gould, Frank Walton, Associate Professor of Range and Forestry and Curator of College Museum. (1949)
B.S., Northern Illinois State College, 1935; M.S., Wisconsin, 1937; Ph.D., California, 1941.

Gravett, Howard L., Associate Professor of Biology. (1946, 1948)
A.B., James Millikin, 1933; M.A., Illinois, 1934; Ph.D., 1939.

Greer, Clayton Alvis, Associate Professor of English. (1938, 1949)
B.A., Texas 1921; M.A., 1927; Ph.D., 1937.

Griffith, James William, Instructor of Physical Education. (1950)
B.S., Oklahoma Agricultural and Mechanical College, 1950.

Groneman, Chris Harold, Professor of Industrial Education and Head of Department. (1940, 1949)
B.S., Kansas State Teachers College, 1931; M.S., 1935; D.Ed., Pennsylvania State College, 1950.

Grumbles, Leland Creed, Associate Professor of Veterinary Bacteriology and Hygiene. (1949)
D.V.M., Agricultural and Mechanical College of Texas, 1945.
(On leave of absence)

Gunter, Percy Glyndon, Professor of English. (1911, 1941)
A.B., Elon College, 1909; M.A., North Carolina, 1910.

Guthrie, William Spurgeon, Associate Professor of Mechanical Engineering. (1942, 1950)
B.S., Central State Teachers College, 1930; M.A., Oklahoma, 1935; Reg. Prof. Eng.

Hadley, Henry Hultman, Associate Professor of Genetics. (1946, 1951)
B.S., Illinois, 1940; M.S., Agricultural and Mechanical College of Texas, 1942; Ph.D., Illinois, 1951.

Hale, Fred, Professor of Animal Husbandry in Charge of Swine Investigations. (1922, 1927)
B.S., Agricultural and Mechanical College of Texas, 1922; M.S., 1925.

Hall, Claude Hampton, Instructor of History. (1951)
B.A., Virginia, 1947; M.A., 1949.

Hall, Dan, Associate Professor of Mathematics. (1928, 1944)
A.B., North Carolina, 1927; A.M., 1928.

Hall, Wayne C., Associate Professor of Plant Physiology and Pathology. (1949, 1951)
B.S., Iowa, 1941; M.S., 1946; Ph.D., 1948.

Hall, William Jarvis, Lieutenant Colonel, Associate Professor of Air Science and Tactics. (1953)
B.S., University of Idaho, 1932.

Hallmark, Glen Duncan, Associate Professor of Electrical Engineering. (1942, 1944)
B.S., Agricultural and Mechanical College of Texas, 1935; M.S., 1946; Ph.D., 1953.

Hamilton, Thomas Rowan, Professor of Business Administration. (1929, 1937)
A.B., Washington and Lee, 1917; M.S., Columbia, 1924; Ph.D., 1938.

Hamner, Bennet Barron, Associate Professor of Aeronautical Engineering. (1946, 1949)
B.S., Agricultural and Mechanical College of Texas, 1938; M.S., 1953; Reg. Prof. Eng.

Hampton, Herbert Elwood, Professor of Agronomy. (1938, 1948)
B.S., Agricultural and Mechanical College of Texas, 1937; Ph.D., Missouri, 1948.

Hancock, Charles Kinney, Professor of Chemistry. (1946, 1949)
B.S., Southwest Texas State Teachers College, 1931; M.A., Texas, 1936; Ph.D., 1939.

Handlin, Dale Lee, Instructor of Animal Husbandry. (1951)
B.S., Kansas State College, 1951.

Hanna, Ralph Lynn, Assistant Professor of Entomology. (1949, 1952)
B.A., Stephen F. Austin State Teachers College, 1939; Ph.D., Agricultural and Mechanical College of Texas, 1951.

Hardaway, Bernice Aubrey, Assistant Professor of Engineering Drawing. (1946, 1951)
B.S., East Texas State Teachers College, 1933; M.Ed., Agricultural and Mechanical College of Texas, 1948.

Hardeman, Lyman Bryce, Assistant Professor of Industrial Education. (1947, 1950)
B.S., Kansas State Teachers College, 1939; M.Ed., Agricultural and Mechanical College of Texas, 1949.

Harrington, Edwin Lincoln, Associate Professor of Civil Engineering. (1939, 1947)
B.S., Wyoming, 1927; C.E., 1937; M.S., Agricultural and Mechanical College of Texas, 1943; Ph.D., 1952; Reg. Prof. Eng.

Harris, Robert Leigh, Instructor of History. (1951)
A.B., Alabama, 1945; M.A., 1946.

Harris, William Donald, Professor of Chemical Engineering. (1935, 1949)
B.S., Iowa State College, 1929; M.S., 1931; Ph.D., 1934; Reg. Prof. Eng.

Harrison, Luther Asbery, Jr., Assistant Professor of Physical Education. (1941, 1949)
B.S., Agricultural and Mechanical College of Texas, 1940.

Harter, Edward Lin, Associate Professor of Chemistry. (1921, 1943)
A.B., Missouri Wesleyan, 1919; M.A., Kansas, 1927.

Hauer, Louis Frederick, Assistant Professor of English. (1937, 1944)
B.A., Dubuque, 1931; M.A., Iowa, 1933.

Haupt, Lewis McDowell, Jr., Professor of Electrical Engineering. (1930, 1948)
B.S., Agricultural and Mechanical College of Texas, 1927; M.S., 1935; Reg. Prof. Eng.

Hayes, Larry K., Instructor of Physical Education. (1951)
B.S., Oklahoma Agricultural and Mechanical College, 1949.

Hays, John Que, Professor of English. (1929, 1945)
A.B., Missouri, 1929; M.A., 1932; Ph.D., California, 1942.

Heaton, Homer Lloyd, Registrar and Secretary of the Academic Council. (1934, 1945)
B.S., Stephen F. Austin State Teachers College, 1929; M.S., Agricultural and Mechanical College of Texas, 1936.

Hedgcock, Ernest Duval, Professor of English. (1936, 1949)
B.A., Tennessee, 1917; M.A., Texas, 1936.

Hedges, Charles Cleveland, Professor of Organic Chemistry. (1912, 1913)
B.S., Kentucky, 1906; A.B., Cornell, 1908; Ph.D., 1912.

Herdener, William Ruben, Lieutenant Colonel, Associate Professor of Military Science and Tactics. (1951)
B.S., Colorado Agricultural and Mechanical College, 1935.

Hierth, Harrison Ewing, Assistant Professor of English. (1946, 1951)
A.B., Illinois Wesleyan, 1935; B.Ed., Illinois State Normal, 1936; M.A., Illinois, 1942.
(On leave of absence)

Hill, John Hugh, Associate Professor of History. (1934, 1949)
A.B., Austin College, 1925; M.A., 1926; M.A., California, 1939; Ph.D., Texas, 1946.

Hill, William Floyd, Instructor of Mathematics. (1945, 1946)
B.S., North Texas State Teachers College, 1938; M.S., 1941.
(On leave of absence)

Hillman, John Rolfe, Assistant Professor of Mathematics. (1938, 1946)
B.S., Millsaps College, 1923; M.A., Missouri, 1929.

Hilton, Alfred Brooks, Instructor of Physics. (1952)
B.S., Virginia Polytechnic Institute, 1949, 1950; M.S., 1952.

Hobgood, Price, Professor of Agricultural Engineering. (1939, 1949)
B.S., Agricultural and Mechanical College of Texas, 1938; M.S., 1940; Reg. Prof. Eng.

Hoffman, Jack Norman, Captain, Assistant Professor of Air Science and Tactics. (1950)
B.A., Southwest Texas State Teachers College, 1942; B.S., United States Military Academy, 1945.

Holcomb, Robert Marion, Professor of Civil Engineering. (1947)
B.S., Arizona, 1936; M.S., Iowa State College, 1941; Reg. Prof. Eng.

Holdredge, Edwin Sereno, Associate Professor of Mechanical Engineering. (1939, 1949)
B.S., Tennessee, 1938; M.S., 1939; Reg. Prof. Eng.

Holland, Charles Donald, Assistant Professor of Chemical Engineering. (1952, 1953)
B.S., North Carolina State College, 1943; M.S., Agricultural and Mechanical College of Texas, 1949; Ph.D., 1953.

Holleman, Theo Rufus, Associate Professor of Architecture. (1946, 1953)
B.Arch., Agricultural and Mechanical College of Texas, 1940; M.Arch., 1951.

Hood, Donald Wilbur, Assistant Professor of Oceanography. (1946, 1950)
B.S., Pennsylvania State College, 1940; M.S., Oklahoma Agricultural and Mechanical College, 1942; Ph.D., Agricultural and Mechanical College of Texas, 1950.

Hopkins, Sewell Hepburn, Professor of Biology. (1935, 1947)
B.S., William and Mary College, 1927; M.A., Illinois, 1930; Ph.D., 1933.

Hord, Asa Andrew, Captain, Assistant Professor of Military Science and Tactics. (1953)
B.S., Agricultural and Mechanical College of Texas, 1942.

Hornbeak, Harold Lancaster, Assistant Professor of Architecture. (1948, 1952)
B.S., Washington University, Missouri, 1948.

Houze, Robert Alvin, Librarian. (1949, 1951)
A.B., Denver, 1940; B.L.S., 1941.

Hovorak, Ludwig M., Instructor of Mathematics. (1946)
B.S., Agricultural and Mechanical College of Texas, 1943; M.Ed., 1952.

Hoyl, Basil Landon, Major, Associate Professor of Air Science and Tactics. (1950)
B.S., Agricultural and Mechanical College of Texas, 1943.

Hoyle, Samuel Cooke, Jr., Associate Professor of Business Adminstration. (1947, 1949)
LL.B., Texas, 1926; B.A., 1946; M.A., 1948.

Huggett, Milton Alfred, Assistant Professor of English. (1946, 1951)
B.A., Rochester, 1929; B.D., Episcopal Theological School, 1933; M.A., Baylor, 1952.

Hughes, Martin Collins, Professor of Electrical Engineering and Head of Department. (1923, 1932)
B.S., Illinois, 1917; E.E., 1926; Reg. Prof. Eng.

Hunt, Robert Lee, Professor of Agricultural Economics. (1927, 1935)
B.S., Agricultural and Mechanical College of Texas, 1924; M.S., North Carolina State College, 1927; Ph.D., Wisconsin, 1934.

Hurt, John Tom, Professor of Mathematics. (1936, 1947)
B.A., Rice Institute, 1931; M.A., 1932; Ph.D., 1935.

Ingram, Charles, Jr., Instructor of Electrical Engineering. (1946)
B.S., Texas Technological College, 1943.
(On leave of absence)

Isbell, Arthur Furman, Assistant Professor of Chemistry. (1953)
B.A., Baylor, 1937; M.S., Texas, 1941; Ph.D., 1943.

Isbell, Truman Truett, Instructor of Engineering Drawing. (1951)
B.S., Agricultural and Mechanical College of Texas, 1948.

Jackson, John Raleigh, Assistant Professor of Agricultural Education. (1952)
B.S., Agricultural and Mechanical College of Texas, 1938; M.Ed., 1948.

Jaggi, Frederick Putnam, Jr., Professor of Veterinary Bacteriology and Hygiene and Assistant to the Dean of Veterinary Medicine. (1937, 1949)
B.S., Agricultural and Mechanical College of Texas, 1924; D.V.M., 1926.

James, Stanley Livingston, Jr., Captain, Assistant Professor of Military Science and Tactics. (1952)
B.S., United States Military Academy, 1943.

Jarvi, Ray Victor, Assistant Professor of Mechanical Engineering. (1941, 1947)
B.S., Michigan College of Mines and Technology, 1940; M.S., 1952.

Jensen, Frederick William, Professor of Chemistry and Head of Department. (1925, 1947)
B.S., Nebraska, 1920; M.S., 1923; Ph.D., 1925.

Jernigan, Jesse Stewart, Instructor of English. (1952)
B.A., North Texas State College, 1933; M.A., Southern Methodist, 1946.

Joham, Howard Ernest, Assistant Professor of Plant Physiology and Pathology. (1946, 1947)
B.A., Santa Barbara College, 1941; M.S., Agricultural and Mechanical College of Texas, 1943; Ph.D., Iowa State College, 1950.

Johnson, Donald Franklin, Jr., Assistant Professor of Veterinary Pathology. (1949, 1951)
D.V.M., Agricultural and Mechanical College of Texas, 1944; M.S., 1953.

Johnson, Hubert Otis, Jr., Major, Associate Professor of Air Science and Tactics. (1952)
B.S., Agricultural and Mechanical College of Texas, 1946.

Jones, David Cluie, Professor of Mathematics. (1909, 1927)
A.B., Emory, 1908.

Jones, Fred Rufus, Professor of Agricultural Engineering and Head of Department. (1921, 1940)
B.S., Wisconsin, 1915; M.S., Iowa State College, 1931; Reg. Prof. Eng.

Jung, Glenn Harold, Acting Assistant Professor of Oceanography. (1953)
S.B., Massachusetts Institute of Technology, 1949; S.M., 1952.

Kahan, Archie Marion, Assistant Professor of Oceanography. (1953)
B.A., Denver, 1936; M.A., 1940; M.S., California Institute of Technology, 1942.

Kammlade, William Garfield, Jr., Assistant Professor of Animal Husbandry. (1951)
B.S., Illinois, 1948; M.S., 1949; Ph.D., 1951.

Kavanaugh, Milam Shelby, Associate Professor of Psychology. (1947, 1951)
B.A., Texas, 1934; M.A., 1934.

Keel, Loyd Bush, Assistant Professor of English. (1942, 1947)
B.A., Texas, 1927; M.A., 1933.

Keim, Samuel Thomas, Associate Professor of Business Administration. (1938, 1950)
B.A., Agricultural and Mechanical College of Texas, 1938; M.S., 1940; I.A., Harvard, 1943.

Kennedy, Harvey Thomas, Distinguished Professor of Petroleum Engineering. (1949)
B.S., Cornell, 1921; Ph.D., Johns Hopkins, 1928; Reg. Prof. Eng.

Kennon, William Upshur, Lieutenant Colonel, Associate Professor of Military Science and Tactics. (1952)
A.B., Virginia Military Institute, 1937.

Kent, Jack Thurston. Associate Professor of Mathematics. (1936, 1952)
A.B., Lambuth College, 1930; M.A., Arkansas, 1931.

Keown, Ernest Ray. Assistant Professor of Mathematics. (1952)
B.S., Texas, 1946; Ph.D., Massachusetts Institute of Technology, 1950.

Kerley, Sidney Auston, Assistant Professor of Education and Associate Director of Guidance, Basic Division. (1952)
B.A., Agricultural and Mechanical College of Texas, 1939; M.Ed., North Texas State College, 1950.

Key, Percy Clark, Associate Professor of English. (1924, 1941)
B.A., Texas Christian, 1917; M.A., Vanderbilt, 1918.

Kidd, Harry Lee, Jr., Associate Professor of English. (1939, 1950)
B.A., Texas, 1935; M.A., 1938.

Kincannon, John Alvin, Instructor of Mathematics. (1946)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1949; Ph.D., 1952.

King, Donald Roy, Assistant Professor of Entomology. (1953)
B.S., Baldwin-Wallace College, 1949; M.S., Ohio State, 1951; Ph.D., 1952.

King, General Tye, Instructor of Animal Husbandry. (1953)
B.S., Kentucky, 1950; M.S., 1951.

Kingston, Albert James, Jr., Associate Professor of Psychology and Director of Guidance, Basic Division. (1950, 1951)
B.S., New York College for Teachers, 1939; M.A., Cornell, 1948; Ph.D., 1950.

Kirkham, Wayne Wolpert, Assistant Professor of Veterinary Medicine and Surgery. (1952)
D.V.M., Agricultural and Mechanical College of Texas, 1941.

Klipple, Edmund Chester, Professor of Mathematics and Head of Department. (1935, 1952)
B.A., Texas, 1926; Ph.D., 1932.

Koss, Walter Eddie, Assistant Professor of Mathematics. (1937, 1946)
A.B., Alabama, 1935; M.A., 1936.
(On leave of absence)

Kranz, Edward Douglas, Instructor of Mechanical Engineering. (1952)

Krezdorn, Alfred Herman, Assistant Professor of Horticulture. (1946, 1950)
B.S., Agricultural and Mechanical College of Texas, 1942; M.S., Florida, 1949.

Krueger, Willie F., Assistant Professor of Poultry Husbandry. (1953)
B.S., Agricultural and Mechanical College of Texas, 1943; M.S., 1949; Ph.D., Missouri, 1952.

Kunkel, Harriott Orren, Assistant Professor of Animal Husbandry and of Biochemistry and Nutrition. (1951)
B.S., Agricultural and Mechanical College of Texas, 1943; M.S., 1948; Ph.D., Cornell, 1950.

Kunze, George William, Assistant Professor of Agronomy. (1952)
B.S., Agricultural and Mechanical College of Texas, 1948; M.S., 1950; Ph.D., Pennsylvania State College, 1952.

Kutach, Wilbur Dee, Instructor, Basic Division. (1952)
B.S., Agricultural and Mechanical College of Texas, 1951; M.Ed., 1952.

Lake, George Glenn, Instructor of English. (1953)
A.B., Michigan State Normal College, 1928; M.A., Michigan, 1932.

LaMotte, Charles, Professor of Biology. (1930, 1939)
B.A., Texas, 1929; M.A., 1929; Ph.D., Illinois, 1937.

Landiss, Carl Wilson, Associate Professor of Physical Education. (1943, 1951)
B.S., Abilene Christian College, 1935; M.Ed., Agricultural and Mechanical College of Texas, 1947; D.Ed., Pennsylvania State College, 1951.

Langford, Ernest, Professor of Architecture and Head of Department. (1915, 1929)
B.S., Agricultural and Mechanical College of Texas, 1913; M.S., Illinois, 1924; Reg. Prof. Arch.

Laverty, Carroll Dee, Associate Professor of English. (1939, 1950)
A.B., Colorado, 1933; A.M., 1934; Ph.D., Duke, 1951.

Lawler, John Joseph, Instructor of English. (1951)
B.A., North Carolina, 1948; M.A., 1949.

Lawyer, Franklin Dewitt, Assistant Professor of Architecture. (1952, 1953)
B.Arch., Oklahoma Agricultural and Mechanical College, 1949; M.Arch., Cranbrook Academy of Art, 1952.

Layer, Robert George, Assistant Professor of Economics. (1952)
B.A., Ohio Wesleyan, 1943; M.A., Harvard, 1948; Ph.D., 1952.

Lee, Dean Ralph, Assistant Professor of Chemistry. (1941, 1947)
B.S., Memphis State College, 1937; M.S., Agricultural and Mechanical College of Texas, 1939.

Leighton, Rudolph Elmo, Associate Professor of Dairy Husbandry. (1947, 1949)
B.S., Oklahoma Agricultural and Mechanical College, 1932; M.S., 1943.

Leipper, Dale F., Professor of Oceanography and Head of Department. (1949, 1950)
B.S., Wittenberg College, 1937; M.A., Ohio State, 1939; Ph.D., California, 1950.

Leland, Thomas William, Professor of Business Adminstration and Head of Department. (1922, 1926)
B.A., Wisconsin, 1921; M.S., 1922; C.P.A., 1928.

Lemmon, James Henry, Jr., Instructor of Architecture. (1951)
B.Arch., Agricultural and Mechanical College of Texas, 1951.

Lenehan, Daniel James, Instructor of Business Administration. (1952)
B.A., Loras College, 1949.

Lenert, August Albert, Professor of Veterinary Medicine and Surgery and Head of Department. (1919, 1937)
B.S., Agricultural and Mechanical College of Texas, 1914; D.V.M., Kansas City Veterinary College, 1917.

Lerret, James Crandall, Instructor of Civil Engineering. (1953)
B.S., Missouri, 1950.

Letbetter, Thomas Doyle, Associate Professor of Business Adminstration. (1948)
B.B.A., Texas, 1933; M.S., Agricultural and Mechanical College of Texas, 1947; C.P.A., 1949.

Libby, Thomas Harlan, Captain, Assistant Professor of Military Science and Tactics. (1953)
B.S., Pennsylvania, 1932.

Lindsay, James Donald, Professor of Chemical Engineering and Head of Department. (1938, 1944)
B.S., Michigan, 1924; M.S., 1925; Ph.D., 1934; Reg. Prof. Eng.

Little, Van Allen, Professor of Entomology. (1923, 1937)
B.A., Sam Houston State Teachers College, 1922; M.S., Agricultural and Mechanical College of Texas, 1925; Ph.D., 1943.

Longley, John Browder, Instructor of Business Administration. (1951)
B.S., Agricultural and Mechanical College of Texas, 1943.

Lowell, Julius Clifton, Major, Associate Professor of Air Science and Tactics. (1950)
B.S., Oklahoma Agricultural and Mechanical College, 1939.

Loyd, Coleman Monroe, Instructor of Physics. (1953)
B.S., Nebraska State Teachers College, 1939; M.A., Wayne, 1948.

Luther, Herbert Adesla, Professor of Mathematics. (1937, 1947)
B.A., Pittsburgh, 1934; M.S., Iowa, 1935; Ph.D., 1937.

Lyle, Robert Reed, Assistant Professor of Mathematics. (1937, 1946)
B.S., Washington and Jefferson College, 1931; M.A., Buffalo, 1933.

Lyman, Carl Morris, Professor of Biochemistry and Nutrition and Head of Department. (1940, 1949)
B.S., Oregon, 1931; A.M., Oregon State College, 1933; Ph.D., Pittsburgh, 1937.

Lynch, Shirley Alfred, Professor of Geology and Head of Department. (1946)
B.S., Missouri, 1928; M.S., 1931; E.M., 1935; Reg. Prof. Eng.

McAfee, Thomas Edison, Associate Professor of Agronomy. (1939, 1953)
B.S., Oklahoma Agricultural and Mechanical College, 1939; M.S., 1940; Ph.D., Agricultural and Mechanical College of Texas, 1953.

McBeth, Lloyd Theodore, Instructor of Engineering Drawing. (1953)
B.S., Agricultural and Mechanical College of Texas, 1951.

McCannon, John Silas, Major, Associate Professor of Air Science and Tactics. (1952)
B.S., Illinois, 1935.

McCulley, William Straight, Assistant Professor of Mathematics. (1937, 1946)
B.A., Iowa, 1932; M.S., Agricultural and Mechanical College of Texas, 1936.

McFarland, Frank Eugene, Assistant Professor, Basic Division. (1951, 1953)
B.A., Baylor, 1950; M.A., Columbia, 1953.
(On leave of absence)

McGee, Dale Fletcher, Jr., Lieutenant Colonel, Associate Professor of Military Science and Tactics. (1953)
B.S., United States Military Academy, 1943.

McGee, Roger Valentine, Associate Professor of Mathematics. (1928, 1948)
B.S., Agricultural and Mechanical College of Texas, 1922; M.S., 1938.

McGuire, John Gilbert, Professor of Engineering Drawing. (1935, 1945)
B.S., Agricultural and Mechanical College of Texas, 1932; M.S., 1937; B.S., 1944; Reg. Prof. Eng.

McIlroy, Winifield W., Assistant Professor of Agricultural Education. (1947, 1948)
B.S., Agricultural and Mechanical College of Texas, 1936; M.Ed., 1942.
(On leave of absence)

McInnis, Sam Roper, Associate Professor of Chemistry. (1944, 1947)
B.A., Daniel Baker College, 1924; M.A., Southwestern, 1927.

McNeely, John Gordon, Professor of Agricultural Economics. (1947, 1950)
B.S., South Dakota State College, 1933; M.S., 1934; Ph.D., Wisconsin, 1941.

McNeil, William Runciman, Captain, Assistant Professor of Military Science and Tactics. (1953)
A.B., Concord College, 1941.

Mackin, John Gilman, Professor of Marine Biology. (1950)
B.S., East Central State College, Ada, Oklahoma, 1924; M.S., Illinois, 1927; Ph.D., 1933.
(On leave of absence)

MacQueen, John W., Instructor of Floriculture and Landscape Architecture and Greenhouse Superintendent. (1953)
B.S., Ohio State, 1934.

Mamaliga, Emil, Assistant Professor of Physical Education. (1947, 1951)
B.S., Ohio State, 1943; M.Ed., Agricultural and Mechanical College of Texas, 1950.

Mangrum, James Freed, Instructor of Biology. (1946)
B.S., State College at Memphis, Tennessee, 1931; M.S., Tennessee, 1936.

Manning, Walter Scott, Associate Professor of Business Administration. (1941, 1947)
B.B.A., Texas College of Arts and Industries, 1932; M.B.A., Texas, 1940; C.P.A., 1952.

Markle, Elias Ward, Professor of Electrical Engineering. (1921, 1930)
B.S., Pennsylvania State College, 1913; M.S., Agricultural and Mechanical College of Texas, 1930.

Martin, Dial Franklin, Associate Professor of Entomology. (1939, 1950)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1942; Ph.D., Iowa State College, 1950.

Martin, Lee Jackson, Assistant Professor of English. (1946, 1951)
B.S., Texas, 1941; M.A., 1948.

Martin, William Bizzell, Instructor of English. (1952)
B.A., Southern Methodist University, 1948; Diploma in English Studies, Edinburgh, Scotland, 1950; Ph.D., 1953.

Mason, Paul M., Assistant Professor of Engineering Drawing. (1946, 1952)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1946.

Mattern, Terrence John, Instructor of English. (1953)
B.A., George Peabody College, 1947; M.A., 1947.

Matthews, Norman DeVere, Instructor of Physical Education. (1950)
A.B., Syracuse, 1950.

Matzen, Walter Theodore, Jr., Assistant Professor of Electrical Engineering. (1949, 1951)
B.S., Iowa State College, 1943; M.S., Agricultural and Mechanical College of Texas, 1950; Reg. Prof. Eng.

Mayo, Thomas Franklin, Professor of English. (1916, 1934)
B.A., Mississippi, 1913; B.A., Oxford, 1916; B.A., 1921; M.A., 1921; Ph.D., Columbia, 1934.

Medlen, Ammon Brown, Assistant Professor of Biology. (1946, 1951)
B.A., Baylor, 1930; M.A., 1932; Ph.D., Agricultural and Mechanical College of Texas, 1952.

Menzel, Robert Winston, Instructor of Biology. (1952, 1953)
B.S., William and Mary College, 1940; M.A., 1943.

Merkle, John, Assistant Professor of Biology. (1948)
B.A., Oklahoma, 1936; Ph.D., Oregon State College, 1948.

Meyers, Frederick David, Instructor of Engineering Drawing. (1949)
B.S., Ohio State, 1949.
(On leave of absence)

Middleton, Errol Bathurst, Professor of Chemistry. (1922, 1942)
B.A., Illinois, 1919; M.S., 1921; Ph.D., 1938.

Miles, Henry James, Professor of Civil Engineering. (1947)
C.E., Brooklyn Polytechnic Institute, 1929; M.S., Rutgers, 1931; Ph.D., 1950; Reg. Prof. Eng.

Miller, Horace Otis, Associate Professor of Journalism. (1947, 1948)
A.B., Texas, 1918; M.J., 1920; LL.B., 1928.

Miller, James Carleton, Professor of Animal Husbandry and Head of Department. (1940, 1947)
B.S., Missouri, 1928; M.S., 1929; Ph.D., 1937.

Miller, Robert Ernest, Instructor, Basic Division, and Psychometrist. (1953)
A.B., Northeastern, 1947; M.A., Boston, 1948.

Miller, Thomas Lloyd, Assistant Professor of History. (1946, 1953)
B.A., East Texas State Teachers College, 1935; M.A., 1945.

Milliff, John Henry, Professor of Veterinary Anatomy and Head of Department. (1936, 1941)
B.S., Agricultural and Mechanical College of Texas, 1931; M.S., 1934; D.V.M., 1936.

Mills, Jim Frank, Instructor of Agronomy. (1946)
B.S., Agricultural and Mechanical College of Texas, 1943; M.S., 1953.

Mitchell, Merlin Peers, Captain, Assistant Professor of Air Science and Tactics. (1953)
B.A., Texas, 1949; M.A., Arkansas, 1951.

Mitchell, Richard Warren, Instructor of Physics. (1947)
B.S., Lynchburg College, 1943; M.S., Agricultural and Mechanical College of Texas, 1953.

Modrow, William Geoffery, Instructor of Economics. (1953)
B.A., Southern Methodist, 1950; M.S., Agricultural and Mechanical College of Texas, 1953.

Mogford, Joseph Sayers, Professor of Agronomy. (1925, 1937)
B.S., Agricultural and Mechanical College of Texas, 1916; M.S., 1920.

Mohr, Hubert Charles, Assistant Professor of Horticulture. (1946, 1947)
B.S., Ohio State, 1938; M.S., 1939.

Montfort, Peter Thorp, Professor of Agricultural Engineering. (1935, 1943)
B.S., Agricultural and Mechanical College of Texas, 1921.

Moore, Albert Vernon, Professor of Dairy Husbandry. (1937, 1944)
B.S., Purdue, 1927; M.S., 1933; Ph.D., Michigan State College, 1948.

Moore, Bill C., Associate Professor of Mathematics. (1937, 1948)
A.B., Kansas, 1929; A.M., 1931; A.M., Princeton, 1937.

Morgan, David Hitchens, President of the College. (1952, 1953)
A.B., Occidental College, 1932; M.A., California, 1933; Ph.D., 1938.

Morgan, Stewart Samuel, Professor of English and Head of Department. (1921, 1952)
B.A., Cincinnati, 1926; M.A., Ohio State, 1927; Ph.D., 1933.

Morgner, Aurelius, Associate Professor of Economics. (1947)
B.S., Missouri, 1938; M.A., 1940.

Morris, William Joseph, Assistant Professor of Geology. (1951)
B.A., Syracuse, 1947; M.A., Princeton, 1950; Ph.D., 1951.

Mullins, Benjamin Franklin Kelso, Associate Professor of Engineering Drawing. (1921, 1946)
A.B., Emory, 1919; M.S., 1922; M.R.E., Southwestern Baptist Theological Seminary, 1927; M.S., Agricultural and Mechanical College of Texas, 1944; Reg. Prof. Eng.

Myers, Shelly Prusher, Jr., Colonel, Professor of Military Science and Tactics. (1949, 1951)
B.S., The Citadel, 1930.

Nance, Joseph Milton, Associate Professor of History. (1941, 1951)
B.A., Texas, 1935; M.A., 1936; Ph.D., 1941.

Neal, Frederick Carlton, Assistant Professor of Veterinary Medicine and Surgery. (1952)
D.V.M., Agricultural and Mechanical College of Texas, 1944.

Nedderman, Wendell Herman, Associate Professor of Civil Engineering. (1947, 1952)
B.S., Iowa State College, 1943; M.Eng., Agricultural and Mechanical College of Texas, 1949; Ph.D., Iowa State College, 1951; Reg. Prof. Eng.

Nelson, Al B., Associate Professor of History. (1937, 1943)
B.A., Texas Christian, 1932; M.A., 1933; Ph.D., California, 1937.

Nelson, Bardin Hubert, Associate Professor of Rural Sociology. (1950, 1952)
B.S., Louisiana, 1942; M.A., 1943; Ph.D., 1950.

Nelson, Thomas Robert, Associate Professor of Mathematics. (1925, 1939)
B.A., East Texas Normal College, 1917; M.A., Texas, 1922.

Newsom, Durward Earl, Assistant Professor of Journalism. (1949)
B.S., Oklahoma Agricultural and Mechanical College, 1948; M.S., Northwestern, 1949.

Nixson, Frank Derrill, Jr., Instructor of Industrial Education. (1953)
B.S., Agricultural and Mechanical College of Texas, 1950.

Nolen, Robert Lawrence, Assistant Professor of Mathematics. (1946, 1950)
B.S., North Texas State Teachers College, 1936; M.S., 1941.

O'Bannon, Lester Severance, Professor of Mechanical Engineering. (1948)
B.M.E., Kentucky, 1915; M.E., 1939.

Oliver, John Percy, Associate Professor of Engineering Drawing. (1936, 1946)
B.S., Agricultural and Mechanical College of Texas, 1926; M.S., 1936; Reg. Prof. Eng.

O'Neill, John Daniel, Instructor of Business Administration. (1952)
B.A., Creighton, 1948; M.A., Illinois, 1949.

Orr, Abner Ross, Assistant Professor of Mechanical Engineering. (1943, 1952)
B.A., Oklahoma Baptist, 1912; M.A., Oklahoma, 1921.

Orr, Joseph Anderson, Professor of Civil Engineering. (1928, 1944)
B.S., Agricultural and Mechanical College of Texas, 1922; M.S., 1933; Reg. Prof. Eng.

Overall, John Wayne, Instructor of Physics. (1943, 1951)
A.B., Baylor, 1921; M.Ed., Agricultural and Mechanical College of Texas, 1950.

Padgett, Claud Everett, Jr., Instructor of Mathematics. (1951)
B.S., North Texas State Teachers College, 1935; M.A., Missouri, 1949.

Page, John Boyd, Professor of Agronomy. (1950)
B.S., Brigham Young, 1936; M.A., Missouri, 1937; Ph.D., Ohio State, 1940.

Page, John Orion, Associate Professor of Chemistry. (1948, 1951)
B.S., Rochester, 1927; Ph.D., Illinois, 1933.

Palmer, Leslie Lloyd, Instructor of Physical Education. (1951)
B.S., Agricultural and Mechanical College of Texas, 1948; M.Ed., 1951.
(On leave of absence)

Parker, Grady P., Professor of Education. (1940, 1950)
B.A., North Texas State Teachers College, 1929; M.A., Southern Methodist, 1935; Ed.D., Texas, 1942.

Parker, Travis Jay, Professor of Geology. (1947, 1952)
B.S., Texas Technological College, 1933; M.A., Texas, 1939; Ph.D., 1952.

Parnell, Edward Douglas, Professor of Poultry Husbandry. (1938, 1943)
B.S., Agricultural and Mechanical College of Texas, 1923; M.S., 1934.

Parrish, Charles Patrick, Major, Associate Professor of Military Science and Tactics. (1952)
B.S., Florida, 1946.

Paschal, Benjamin Edwin, Jr., Captain, Assistant Professor of Air Science and Tactics. (1951)
B.Ceramic Eng., North Carolina State College, 1942.

Paulson, Walter Ernest, Professor of Agricultural Economics. (1947)
Ph.B., Wisconsin, 1917; Ph.D., 1923.

Peacock, Dan, Instructor of Chemistry. (1953)
B.A., North Texas State Teachers College, 1943.

Pedigo, John Randolph, Associate Professor of Petroleum Engineering. (1953)
B.S., Texas, 1935; B.A., 1935.

Peirce, James Franklin, Assistant Professor of English. (1946, 1951)
A.B., Illinois, 1940; M.A., Iowa, 1942.

Penberthy, Walter Lawren, Dean of Men. (1926, 1947)
B.S., Ohio State, 1926.

Perry, John Vivian, Jr., Instructor of Mechanical Engineering. (1949)
B.S., Virginia Polytechnic Institute, 1947.

Peters, Isaac Isaac, Associate Professor of Dairy Husbandry. (1950, 1952)
B.S.A., Manitoba, 1942; M.S., Michigan State College, 1944; Ph.D., Iowa State College, 1947.

Peurifoy, Robert Leroy, Professor of Civil Engineering. (1946)
B.S., Texas, 1927; M.S., 1929; Reg. Prof. Eng.

Phillips, Henry Lemle, Lieutenant Colonel, Associate Professor of Military Science and Tactics. (1953)
B.S., Agricultural and Mechanical College of Texas, 1928.

Phillips, Randolph Gavan, Captain, Assistant Professor of Air Science and Tactics. (1950)
B.S., North Texas State College, 1937.

Ponthieux, Nicholas Archibald, Assistant Professor of Physical Education. (1941, 1948)
B.S., Agricultural and Mechanical College of Texas, 1941; M.Ed., 1950.

Porter, Walter Lee, Professor of Mathematics. (1918, 1927)
A.B., Howard College, 1911; M.S., Agricultural and Mechanical College of Texas, 1926.

Potter, George Edwin, Professor of Zoology. (1939)
B.S., Ottawa, 1921; M.S., Iowa, 1923; Ph.D., 1927; D.Sc., Ottawa, 1946.

Potter, James Gregor, Professor of Physics and Head of Department. (1945)
B.S., Princeton, 1928; M.S., New York, 1931; Ph.D., Yale, 1939.

Potts, Richard Carmechial, Associate Professor of Agronomy. (1936, 1948)
B.S., Oklahoma Agricultural and Mechanical College, 1935; M.S., Agricultural and Mechanical College of Texas, 1945; Ph.D., Nebraska, 1950.

Potts, William McDaniel, Professor of Chemistry. (1926, 1938)
B.S., Chicago, 1921; M.S., 1927; Ph.D., 1937.

Powell, Francis Warren, Assistant Professor of English. (1937, 1944)
B.A., Austin College, 1920; M.A., Texas, 1928.

Prescott, John Mack, Jr., Assistant Professor of Biochemistry and Nutrition. (1952)
B.S., Southwest Texas State Teachers College, 1942; M.S., Agricultural and Mechanical College of Texas, 1949; Ph.D., Wisconsin, 1952.

Price, Alvin Audis, Assistant Professor of Veterinary Anatomy. (1949, 1951)
B.S., Agricultural and Mechanical College of Texas, 1940; D.V.M., 1949.

Price, Manning A., Assistant Professor of Entomology. (1940, 1949)
B.S., Agricultural and Mechanical College of Texas, 1939; M.S., 1941.

Price, William Armstrong, Professor of Geological Oceanography. (1946, 1949)
A.B., Davidson College, 1909; Ph.D., Johns Hopkins, 1913.

Putnam, Harlan Ray, Associate Professor of Economics. (1941, 1946)
B.S., Iowa State College, 1935; M.A., 1941.

Quick, Nicholas Wilson, Assistant Professor of English. (1947, 1953)
A.B., Illinois, 1942; M.A., 1947.

Quisenberry, John Henry, Professor of Poultry Husbandry and Head of Department. (1936, 1946)
B.S., Agricultural and Mechanical College of Texas, 1931; M.S., Illinois, 1933; Ph.D., 1936.

Rakoff, Henry, Assistant Professor of Chemistry. (1953)
B.S., City College of New York, 1944; M.S., Purdue, 1948; Ph.D., 1950.

Ransdell, Clifford Howell, Associate Professor of Engineering Drawing and Assistant to the Dean of the Basic Division. (1937, 1950)
B.S., Texas Technological College, 1937.

Redmond, Harold Edwin, Professor of Veterinary Medicine and Surgery. (1940, 1952)
D.V.M., Agricultural and Mechanical College of Texas, 1939.

Reeves, Robert Gatlin, Professor of Genetics. (1928, 1947)
B.S., Mississippi State College, 1922; M.S., 1923; Ph.D., Iowa State College, 1928.

Reid, George Kell, Jr., Assistant Professor of Wildlife Management. (1953)
B.S., Presbyterian College, 1940; M.S., Florida, 1949; Ph.D., 1952.

Reid, Robert Osborne, Associate Professor of Oceanography. (1951, 1953)
B.E., Southern California, 1946; M.S., Scripps Institute of Oceanography, 1948.

Reinhard, Henry J., Professor of Entomology. (1947)
B.S., Ohio State, 1915.

Reiser, Raymond, Associate Professor of Biochemistry and Nutrition. (1949)
A.B., Western Reserve, 1929; Ph.D., Ohio State, 1936.

Rhodes, Robert Raymond, Assistant Professor of Range and Forestry. (1946)
B.S.F., Louisiana, 1937.

Rice, Warren, Assistant Professor of Mechanical Engineering. (1950, 1953)
B.S., Agricultural and Mechanical College of Texas, 1949; M.S., 1953; Reg. Prof. Eng.

Richardson, Luther Ray, Professor of Biochemistry and Nutrition. (1946, 1949)
B.S., Georgetown College, 1923; A.M., Missouri, 1928; Ph.D., 1932.

Ridgway, Valentine Fenton, Assistant Professor of Business Administration. (1949, 1952)
B.S., Missouri, 1948; M.S., 1950.

Riggs, John Kamm, Associate Professor of Animal Husbandry. (1941, 1942)
B.S., Iowa State College, 1935; M.S., Agricultural and Mechanical College of Texas, 1941.

Robertson, George Leven, Associate Professor of Animal Husbandry. (1946, 1951)
B.S., Louisiana State, 1941; M.S., Agricultural and Mechanical College of Texas, 1947; Ph.D., Wisconsin, 1951.

Robinson, Kid Frank, Assistant Professor of Architecture. (1952, 1953)
B.Arch., Agricultural and Mechanical College of Texas, 1940; Reg. Prof. Arch.

Rode, Norman Frederick, Professor of Electrical Engineering. (1922, 1930)
B.S., Clemson College, 1919; M.S., Agricultural and Mechanical College of Texas, 1929; E.E., Clemson College, 1939; Reg. Prof. Eng.

Rodgers, Edward Wesley, Captain, Assistant Professor of Air Science and Tactics. (1953)
B.S., Maryland, 1953.

Rodgers, Mettie Azalee, Instructor of English. (1947)
A.B., Baylor, 1916; M.A., Chicago, 1932.

Rosberg, David William, Assistant Professor of Plant Physiology and Pathology. (1950)
B.A., St. Olaf College, 1940; M.S., Ohio State, 1946; Ph.D., 1949.

Ross, Henry, Professor of Agricultural Education. (1935)
B.S., Agricultural and Mechanical College of Texas, 1923; M.S., 1935.

Roth, Earl Eugene, Instructor of Veterinary Bacteriology and Hygiene. (1953)
D.V.M., Agricultural and Mechanical College of Texas, 1948.

Rothrock, Walton Hoyt, Associate Professor of Modern Languages. (1946, 1951)
A.B., Wofford College, 1940; M.A., Vanderbilt, 1941.
(On leave of absence)

Rotsch, Melvin Medford, Associate Professor of Architecture. (1950, 1951)
B.S., Texas, 1928; M.Arch., Harvard, 1930.

Rupel, Isaac Walker, Professor of Dairy Husbandry and Head of Department. (1945)
B.S., Illinois, 1923; M.S., Wisconsin, 1924; Ph.D., 1932.

Russell, Daniel, Professor of Rural Sociology. (1926)
A.B., Baylor, 1922; A.M., Chicago, 1931.

Russell, Ralph Keith, Instructor of Physics. (1946)
B.S., Nebraska State Teachers College, 1936.

Russell, Simon Tyler, Instructor of Agricultural Engineering. (1951)
B.S., Clemson Agricultural College, 1949.

Russell, William Low, Professor of Geology. (1946, 1951)
B.A., Yale, 1920; M.S., 1922; Ph.D., 1927.

Ryan, Cecil Benjamin, Assistant Professor of Poultry Husbandry. (1947, 1949)
B.S., Texas College of Arts and Industries, 1938; M.S., Agricultural and Mechanical College of Texas, 1947.

Salisbury, Ralph James, Instructor of English. (1951)
B.A., Iowa, 1948; M.A., 1951.

Sandstedt, Carl Edward, Professor of Civil Engineering. (1923, 1938)
A.B., Leland Stanford, 1910; M.S., Agricultural and Mechanical College of Texas, 1928; Reg. Prof. Eng.

Saucier, Walter Joseph, Assistant Professor of Meteorology. (1952)
B.S., Southwestern Louisiana Institute, 1942; M.S., Chicago, 1947; Ph.D., 1951.

Sauer, Edward Field, Colonel, Associate Professor of Military Science and Tactics. (1950)
B.S., Indiana, 1922; LL.B., Jefferson School of Law, 1928.

Schiller, Robert Edwin, Jr., Assistant Professor of Civil Engineering. (1946, 1950)
B.S., Agricultural and Mechanical College of Texas, 1940; M.S., 1949; Reg. Prof. Eng.

Schlesselman, George Wilhelm, Professor of Geography and Head of Department. (1934, 1945)
B.A., Iowa State Teachers College, 1927; M.A., Clark, 1928; Ph.D., Nebraska, 1935.

Schmidt, Hubert, Professor of Veterinary Research. (1949)
B.S., Agricultural and Mechanical College of Texas, 1908; D.V.M., Royal Veterinary School, Berlin, Germany, 1912.

Schram, Alfred Francis, Assistant Professor of Chemistry. (1953)
B.A., Oklahoma, 1941; M.S., 1943; Ph.D., 1948

Segrest, Herman Brazill, Associate Professor of Physical Education. (1945, 1949)
B.S., North Texas State Teachers College, 1937; M.S., 1946.

Seward, Clay Luzenberg, Jr., Associate Professor of Geology. (1948, 1952)
B.S., Agricultural and Mechanical College of Texas, 1941; M.S., 1950; Geol.E., 1953.

Shawn, James Loyd, Assistant Professor of Mathematics. (1943, 1950)
B.S., North Texas State Teachers College, 1936; M.S., 1939.

Shepardson, Charles Noah, Dean of the School of Agriculture. (1928, 1944)
B.S., Colorado Agricultural and Mechanical College, 1917; M.S., Iowa State College, 1924.

Shepperd, James Nolen, Assistant Professor of English. (1941, 1947)
B.A., Texas, 1931; M.A., 1936.

Sherman, Lawrence William, Jr., Instructor of Business Administration. (1952)
B.S., Miami University, Ohio, 1951; M.B.A., Indiana, 1952.

Sherwood, Ross M., Professor of Poultry Husbandry. (1949)
B.S., Iowa State College, 1910; M.S., Agricultural and Mechanical College of Texas, 1924.

Shrode, Robert Ray, Associate Professor of Genetics. (1947, 1949)
B.S., Colorado Agricultural and Mechanical College, 1943; M.S., Iowa State College, 1945; Ph.D., 1949.

Simmang, Clifford Max, Professor of Mechanical Engineering. (1938, 1951)
B.S., Agricultural and Mechanical College of Texas, 1936; M.S., 1938; Ph.D., Texas, 1952; Reg. Prof. Eng.

Sims, Stillman Austin, Assistant Professor of Mathematics. (1942, 1950)
B.S., Southwest Texas State Teachers College, 1939; M.S., Agricultural and Mechanical College of Texas, 1944.

Skrabanek, Robert Leonard, Assistant Professor of Rural Sociology. (1949)
B.S., Agricultural and Mechanical College of Texas, 1942; M.S., 1947; Ph.D., Louisiana, 1949.

Skrivanek, John Marion, Professor of Slavonic Languages. (1952)
B.A., Texas, 1938; M.A., 1946; Ph.D., Charles (Prague), 1948.

Smith, Elmer Gillam, Professor of Physics. (1924, 1942)
A.B., Amherst College, 1919; M.S., Agricultural and Mechanical College of Texas, 1925; B.S., 1934; M.E., 1939; Ph.D., Texas, 1941.

Smith, Fred Emmett, Associate Professor of Geology. (1948)
B.S., Louisiana, 1930; M.S., 1932.

Smith, Frank Miller, Assistant Professor of Civil Engineering. (1948)
B.S., Agricultural and Mechanical College of Texas, 1927; M.S., 1939; Reg. Prof. Eng.

Smith, Hilton Atmore, Professor of Veterinary Pathology and Head of Department. (1949)
D.V.M., Colorado Agricultural and Mechanical College, 1928; M.S., Michigan, 1935; Ph.D., 1949.

Smith, Wesley Warren, Associate Professor of Mechanical Engineering. (1948, 1950)
B.S., Montana State College, 1934; M.E., 1947.

Snuggs, Roland Edward, Associate Professor of Chemistry. (1924, 1946)
A.B., Georgetown College, 1920; M.S., Florida, 1923; B.S., Agricultural and Mechanical College of Texas, 1937.

Sorrels, Joseph Harrell, Professor of Civil Engineering. (1941, 1948)
A.B., Texas Christian, 1924; M.S., Vanderbilt, 1925; B.S., Agricultural and Mechanical College of Texas, 1946; Reg. Prof. Eng.

Southwell, Sam Beall, Assistant Professor of English. (1947, 1953)
B.J., Texas, 1947; M.A., 1948.

Spangler, Lauren Elmer, Assistant Professor of Horticulture. (1952)
B.S., Nebraska, 1949; M.S., State College of Washington, 1951.

Sperry, John Jerome, Professor of Biology. (1941, 1951)
B.A., Nebraska, 1936; M.A., Missouri, 1938; Ph.D., Nebraska, 1942.

Sperry, Omer Edison, Professor of Range and Forestry. (1946, 1949)
A.B., Peru, Nebraska, State College, 1925; M.A., Nebraska, 1931; Ph.D., 1934.

Stack, Edward MacGregor, Assistant Professor of Modern Languages. (1952)
A.B., Princeton, 1941; A.M., 1949; Ph.D., 1950.

Stallings, Henry Green, Instructor of Mechanical Engineering. (1946)

Stark, Lawrence Edward, Associate Professor of Engineering Drawing. (1941, 1951)
B.S., Agricultural and Mechanical College of Texas, 1941; M.Ed., 1951.

Steen, Ralph Wright, Professor of History. (1935, 1943)
B.A., McMurry College, 1927; M.A., Texas, 1929; Ph.D., 1934.

Stephenson, Henson Knowlen, Acting Professor of Civil Engineering. (1945, 1948)
B.S., Alabama Polytechnic Institute, 1923; M.S., Michigan, 1931; C.E., Alabama Polytechnic Institute, 1941.

Stevens, Albert Byron, Professor of Petroleum Engineering and Head of Department. (1934, 1953)
B.S., California, 1927; M.S., Southern California, 1932; Reg. Prof. Eng.

Stevenson, Robert M., Professor of Business Administration. (1947)
B.A., Duke, 1937; M.A., Pennsylvania State College, 1946.

Stewart, Norman Arthur, Jr., Assistant Professor of Business Administration. (1946, 1949)
LL.B., Baylor, 1938.

Stokes, Elmore Ewing, Jr., Assistant Professor of English. (1951, 1953)
B.A., Texas, 1943; M.A., 1948; Ph.D., 1951.

Street, William Ezra, Professor of Engineering Drawing and Head of Department. (1941)
B.S., Texas Technological College, 1930; M.A., 1933; LL.D., Harding College, 1947; Reg. Prof. Eng.

Thiers, Harry Delbert, Assistant Professor of Biology. (1947, 1951)
B.A., Texas, 1941; M.A., 1947.

Thigpen, Henry Smith, Captain, Assistant Professor of Military Science and Tactics. (1953)
B.S., Alabama Polytechnic Institute, 1943.

Thomas, Frank Lincoln, Professor of Entomology. (1947)
B.S., Massachusetts, 1910; Ph.D., Massachusetts Agricultural College, 1914.

Thomas, Gerald Waylette, Assistant Professor of Range and Forestry. (1951)
B.S., Idaho, 1941; M.S., Agricultural and Mechanical College of Texas, 1951.

Thompson, Herbert Gordon, Jr., Assistant Professor of Business Administration. (1951)
B.S., Miami, 1947; M.B.A., 1949.

Thompson, John George Hatch, Associate Professor of Mechanical Engineering. (1938, 1943)
B.S., Pennsylvania State College, 1933; M.E., 1938; M.S., Agricultural and Mechanical College of Texas, 1950; Reg. Prof. Eng.

Thompson, Lee Price, Professor of Mechanical Engineering. (1938, 1948)
B.A., Indiana, 1936; M.S., Agricultural and Mechanical College of Texas, 1938; Ph.D., 1953.

Thompson, Robert David, Assistant Professor of Chemistry. (1952)
B.S., Illinois, 1943; Ph.D., Iowa, 1951.

Tidwell, William L., Assistant Professor of Biology. (1951)
B.S., South Carolina, 1945; M.S., Hawaii, 1948; Ph.D., California at Los Angeles, 1951.

Timm, Tyrus Raymond, Professor of Agricultural Economics and Sociology and Head of Department. (1947, 1953)
B.S., Agricultural and Mechanical College of Texas, 1934; M.S., 1936; M.P.A., Harvard, 1947; D.P.A., 1949.

Tishler, Carl Edward, Professor of Physical Education and Head of Department. (1941, 1947)
B.S., Ohio State, 1926; M.A., Western Reserve, 1935.

Tittle, Morris Edward, Assistant Professor of Mathematics. (1943, 1951)
B.A., East Texas State Teachers College, 1923; M.A., Texas, 1937.

Tolle, Leon Julius, Jr., Assistant Professor of Floriculture and Landscape Architecture. (1953)
B.S., Agricultural and Mechanical College of Texas, 1950; M.S., 1952.

Trotter, Ide Peebles, Dean of the Graduate School. (1936, 1949)
B.A., Mississippi College, 1915; B.S., Mississippi State College, 1918; M.S., 1921; Ph.D., Wisconsin, 1933.

Truettner, Willard Irving, Professor of Mechanical Engineering. (1930, 1943)
B.S., Michigan, 1928; M.S.E., 1930; Reg. Prof. Eng.

Turk, Richard Duncan, Professor of Veterinary Parasitology and Head of Department. (1944)
D.V.M., Kansas State College, 1933; M.S, Agricultural and Mechanical College of Texas, 1939.

Van der Zant, Wilhalmus Carl, Assistant Professor of Dairy Husbandry. (1953)
B.S., Wageningen, 1947; M.S., 1949; M.S., Iowa State College, 1950; Ph.D., 1953.

Varvel, Walter A., Professor of Psychology. (1941, 1945)
A.B., Kansas, 1932; M.A., 1933; Ph.D., 1938.

Vetter, Gale Kay, Assistant Professor of Architecture. (1951, 1952)
B.Arch., Oregon, 1949.

Vezey, Edward Earl, Professor of Physics. (1920, 1938)
B.S., Oklahoma Agricultural and Mechanical College, 1910; M.S., Agricultural and Mechanical College of Texas, 1927.

Vrooman, Richard, Assistant Professor of Architecture. (1949, 1952)
B.A., Oberlin College, 1941; B.Arch., Western Reserve, 1949; M.Arch., Agricultural and Mechanical College of Texas, 1952; Reg. Prof. Eng.

Waddell, Charles Christian, Major, Associate Professor of Military Science and Tactics. (1952)
B.S., Missouri, 1941.

Waldrip, William Jasper, Assistant Professor of Range and Forestry. (1950, 1952)
B.S., Agricultural and Mechanical College of Texas, 1949; M.S., 1950.

Walker, Clinton Samuel, Associate Professor of Electrical Engineering. (1949)
B.S., Texas Technological College, 1939; M.S., Ohio State, 1948.

Waller, James M., Assistant Professor of Economics. (1949)
B.A., Vanderbilt, 1922; LL.B., Yale, 1924; M.A., Vanderbilt, 1927.

Walton, Ernest Vernon, Professor of Agricultural Education and Head of Department. (1946, 1953)
B.S., Agricultural and Mechanical College of Texas, 1937; M.S., 1947.

Wapple, Albert Russell, Instructor of Mathematics. (1942)
B.S., California, 1914; M.A., 1915.

Ward, John Kidd, Instructor of Physics. (1946)
B.A., Texas, 1938; M.A., 1939.

Ward, James McCall, Assistant Professor of Agricultural Economics. (1941, 1946)
B.S., Agricultural and Mechanical College of Texas, 1924; M.S., 1938.

Ward, Robert Page, Professor of Electrical Engineering and Assistant to the Dean of Engineering. (1925, 1948)
B.S., Agricultural and Mechanical College of Texas, 1924; M.S., 1934.

Warren, William Michael, Associate Professor of Animal Husbandry. (1941, 1953)
B.S., Michigan State College, 1940; M.S., Agricultural and Mechanical College of Texas, 1948; Ph.D., Missouri, 1952.

Watkins, Gustav McKee, Professor of Plant Physiology and Pathology and Head of Department. (1949, 1950)
B.A., Texas, 1929; M.S., 1930; Ph.D., Columbia, 1935.

Watson, Clarence Ellis, Instructor of Agronomy. (1951)
B.S., Oklahoma Agricultural and Mechanical College, 1951.

Watson, George Mario, Professor of Chemistry. (1948, 1950)
B.S., Texas, 1938; M.S., 1940; Ph.D., 1943.
(On leave of absence)

Way, John Allen, Colonel, Professor of Air Science and Tactics. (1952)
B.S., Oklahoma, 1931.

Weaver, Paul, Distinguished Professor of Geology. (1953)
A.B., Columbia, 1908; Reg. Prof. Eng.

Weekes, Donald Fessenden, Professor of Physics. (1937, 1945)
B.S., Middlebury College, 1924; M.A., Amherst College, 1926; Ph.D., Cornell, 1937.

Westbrook, Luther Joe, Major, Associate Professor of Air Science and Tactics. (1951)
B.S., Agricultural and Mechanical College of Texas, 1942; M.S., 1946.

White, Robert Frederick, Associate Professor of Floriculture and Landscape Architecture and Acting College Landscape Architect. (1947, 1949)
B.S., Pennsylvania State College, 1934; M.Land., Michigan, 1951.

Whitehead, Marvin Delbert, Assistant Professor of Plant Physiology and Pathology. (1949)
B.S., Oklahoma Agricultural and Mechanical College, 1939; M.S., 1946; Ph.D., Wisconsin, 1949.

Whiting, Robert Louis, Professor of Petroleum Engineering. (1946, 1949)
B.S., Texas, 1939; M.S., 1943; Reg. Prof. Eng.

Whitmore, Frank Charles, Instructor of Physics. (1951)
A.B., Gettysburg College, 1949; M.A., Delaware, 1951.

Wiening, Victor, Instructor of English. (1952)
B.A., Valparaiso, 1947; M.A., Louisiana State, 1949.

Wilcox, George Barton, Professor of Education and Head of Department of Education and Psychology. (1920, 1945)
B.S., Sam Houston State Teachers College, 1912; B.S., Agricultural and Mechanical College of Texas, 1923; A.M., Columbia, 1926.

Wilkes, Lambert Henry, Instructor of Agricultural Engineering. (1948)
B.S. Clemson Agricultural and Mechanical College, 1948; M.S., Agricultural and Mechanical College of Texas, 1953.
(On leave of absence)

Willets, Robert T., Major, Associate Professor of Military Science and Tactics. (1952)
B.S., Maine, 1941.

Wills, Franklin Knight, Instructor of Veterinary Bacteriology and Hygiene. (1952)
D.V.M., Pennsylvania, 1950.

Wilson, Basil Wrigley, Acting Associate Professor of Oceanography. (1953)
B.S., Cape Town, 1931; M.S., Illinois, 1939; C.E., 1940; D.Sc., Cape Town, 1953.

Wilson, Jesse D., Instructor of Geography. (1952)
B.S., Florida State, 1949; M.S., 1951.

Winder, William J., Major, Associate Professor of Military Science and Tactics. (1952)
B.S., Oklahoma, 1941.

Wingren, Roy Matthew, Professor of Mechanical Engineering. (1928, 1943)
B.S., Agricultural and Mechanical College of Texas, 1927; M.S., 1934; Reg. Prof. Eng.

Wood, Robert P., Assistant Professor of Business Administration. (1948, 1951)
B.B.A., Sam Houston State Teachers College, 1947; M.S., Agricultural and Mechanical College of Texas, 1950.

Woods, Paul Joseph, Assistant Professor of History. (1946, 1949)
B.A., Illinois, 1938; M.A., 1940; Ph.D., 1941.

Woolket, Joseph John, Professor of Modern Languages and Head of Department. (1925, 1945)
A.B., Oberlin College, 1924; M.A., 1925.

Wretlind, Dale Eugene, Instructor of English. (1948)
B.S., North Dakota State Agricultural College, 1943; M.A., Iowa, 1948.

Wright, Ernest Charles, Major, Associate Professor of Military Science and Tactics. (1953)
B.S., Pennsylvania State College, 1942.

Wright, Samuel Robert, Professor of Civil Engineering and Head of Department. (1923, 1946)
B.S., Agricultural and Mechanical College of Texas, 1922; M.S., 1928; C.E., 1931; Ph.D., 1946; Reg. Prof. Eng.

Wright, Welcome Ernest, Associate Professor of Industrial Education. (1946, 1953)
B.S., East Texas State Teachers College, 1932; M.S., Agricultural and Mechanical College of Texas, 1939; D.Ed., Pennsylvania State College, 1953.

Wykes, Stanley Allen, Professor of Industrial Engineering. (1947, 1951)
B.S., Pennsylvania State College, 1940; M.S., Virginia Polytechnic Institute, 1946; Reg. Prof. Eng.

Yantis, Theodore R., Associate Professor of Business Administration. (1952)
A.B., Otterbein College, 1947; M.B.A., Ohio State, 1949.

York, Ernest Charles, Instructor of English. (1946)
B.A., Concord Seminary, 1942; B.S., Houston, 1944; M.A., Texas, 1948.
(On leave of absence)

Young, Vernon Alphus, Professor of Range and Forestry and Head of Department. (1929, 1946)
B.S., Utah State Agricultural College, 1923; M.S., Iowa State College, 1924; Ph.D., Minnesota, 1929.

Zahn, Charles Williard, Associate Professor of Veterinary Medicine and Surgery. (1952)
D.V.M., Agricultural and Mechanical College of Texas, 1941.

Zimmerman, Howard Karl, Jr., Assistant Professor of Chemistry. (1952)
B.S., Washington, 1942; M.A., Leland Stanford, 1944; Ph.D., Oregon, 1948.

Zingery, Wilbur Lewis, Instructor of Physics. (1951)
B.S., Agricultural and Mechanical College of Texas, 1950; M.S., 1951.

SUMMARY OF THE TEACHING STAFF AS OF DECEMBER 10, 1953

	Active	On Leave	Total
Heads of Departments of Instruction and Other Members of the Academic Council	59	0	59
Other Full Professors	107	3	110
Associate Professors	120	4	124
Assistant Professors	138	6	144
Instructors	93	7	100
Total	517	20	537

RETIRED FACULTY MEMBERS

Bagley, John Brewer, Professor Emeritus of Cotton Marketing. (1905, 1947)
B.A., Wake Forest College, 1900.

Bilsing, Sherman Weaver, Professor Emeritus of Entomology. (1913, 1918)
B.S., Otterbein College, 1912; A.B., Ohio State, 1912; M.A., 1913; Ph.D., 1924.

Burchard, Charles Winfield, Professor Emeritus of Organic Chemistry. (1917, 1952)
A.B., Allegheny College, 1908; M.A., Wisconsin, 1911.

Campbell, Charles Boyle, Professor Emeritus of Modern Languages. (1903, 1948)
Ph.B., DePauw, 1900; Ph.D., Chicago, 1912.

Dunn, Ralph Clark, Professor Emeritus of Veterinary Bacteriology and Hygiene. (1911, 1950)
D.V.M., Ohio, 1911.

Giesecke, Frederick Ernest, Professor Emeritus of Heating, Ventilating, and Air Conditioning. (1886, 1945)
M.E., Agricultural and Mechanical College of Texas, 1890; S.B., in Architecture, Massacusetts Institute of Technology, 1904; Ph.D., Illinois, 1924.

Hughes, William Lycurgus, Professor Emeritus of Education. (1920, 1947)
B.A., Howard Payne College, 1920; B.S., Agricultural and Mechanical College of Texas, 1921; M.S., 1922.

Humbert, Eugene Peter, Professor Emeritus of Genetics. (1916, 1951)
B.S.A., Iowa State College, 1906; M.S., Cornell, 1908; Ph.D., 1910.

Jones, Beecher Calvin, Assistant Professor Emeritus of Chemistry. (1921, 1947)
A.B., Baylor, 1921; B.S., Agricultural and Mechanical College of Texas, 1923; M.S., 1926.

Koenig, Louis Adolph, Assistant Professor Emeritus of Chemistry. (1920, 1945)
B.A., Texas, 1917.

Kyle, Edwin Jackson, Dean Emeritus of the School of Agriculture. (1902, 1945)
B.S., Agricultural and Mechanical College of Texas, 1899; B.S.A., Cornell, 1901; M.S.A., 1902; D.Sc., Arkansas, 1941.

McGinnis, Nestor Massie, Professor Emeritus of Floriculture and Landscape Architecture. (1915, 1953)
B.S., Agricultural and Mechanical College of Texas, 1908.

Marsteller, Ross Perry, Dean Emeritus of the School of Veterinary Medicine. (1905, 1950)
D.V.M., Ohio State, 1905.

Mitchell, Alva, Professor Emeritus of Engineering Drawing. (1902, 1945)
B.C.E., Agricultural and Mechanical College of Texas, 1894.

Reid, Duncan Henry, Professor Emeritus of Poultry Husbandry. (1923, 1951)
B.S., Wisconsin, 1919; M.S., 1922.

Silvey, Oscar William, Professor Emeritus of Physics. (1916, 1951)
A.B., Indiana, 1907; A.M., 1910; Ph.D., Chicago, 1915.

Summey, George, Jr., Professor Emeritus of English. (1922, 1951)
A.B., Southwestern Presbyterian, 1897; M.A., 1898; Ph.D., Columbia, 1919.

Winkler, Charles Herman, Professor Emeritus of Psychology. (1923, 1946)
B.S., Texas, 1904; M.A., 1914; Ph.D., Missouri, 1916.

THE COLLEGE

LOCATION

The Agricultural and Mechanical College of Texas is located at College Station, Brazos County, Texas, 100 miles north of Houston, 100 miles east of Austin, and 170 miles south of Dallas. It is served by the Southern Pacific and Missouri Pacific Railroads, with convenient connections to all parts of the State; by bus lines; and by Pioneer Airlines, which maintains a terminal at Easterwood Field, the college airport, located about two miles from the campus. A modern system of paved highways affords direct communication with the principal cities and towns of the State.

HISTORICAL SKETCH

The Agricultural and Mechanical College of Texas, like the land grant institutions in other states of the Union, owes its origin to the Morrill Act, which was approved by Congress July 2, 1862. This act provided for the donation of a specified amount of public lands to the several states and territories. Proceeds from the sale of these lands were to constitute a perpetual fund, the principal of which should remain forever undiminished. The interest from this fund was to be used for the support of at least one technological college whose objective must be, without excluding other scientific and classical studies and including military tactics, to teach branches of learning pertaining to agriculture and mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life. The Legislature of Texas accepted the provisions of the congressional legislation in 1866, and $174,000 was realized from the sale of lands set aside under the Act. Before the College opened, this fund had grown to $209,000 through the addition of accrued interest.

In April, 1871, the Legislature provided for the establishment of the Agricultural and Mechanical College. A commission created for the purpose of locating the College accepted the offer made by the citizens of Brazos County and located the institution on a tract of 2,416 acres of land in that county. The College was formally opened, and instruction began on October 4, 1876. Its educational activities have been enlarged through the last half century when the need for such expansion became evident. At the present time both undergraduate and graduate instruction are offered not only in the fields of agriculture and engineering but also in

liberal arts, science, education, business administration, and veterinary medicine.

The purchase from time to time of additional land adjacent to the original tract has increased the land owned by the College in Brazos County to approximately 5,200 acres. In 1944 the College acquired a plantation of 3,192 acres in Burleson County for experimental purposes, while in 1950 the College acquired 411 acres in Kimble County for the Junction Adjunct of the Agricultural and Mechanical College of Texas. The value of the physical plant has grown to approximately $30,000,000, and a good foundation has been laid at the College for instruction, for investigation, and for extension by means of financial aid secured from both the Congress and the State Legislature.

OBJECTIVES OF THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

In conformity with the constitution and the laws of the State of Texas, the purposes and principal objectives of the A. and M. College of Texas are declared to be as follows:

1

To develop and maintain a state-wide educational system in accord with the recognized needs of the people of Texas and dedicated primarily to the broad fields of agriculture, engineering, and military science, with principal offices at the main college, located at College Station, for white male students only; with such authorized branch colleges, including the branch college for negroes at Prairie View, extension services, experiment stations, and other facilities throughout the State as may be required to meet all objectives.

2

To provide an environment for student bodies comparable to that which usually prevails in the substantial Texas homes from which these students come; superior instruction, including requirements in the study of the national and state governments under which we live, with constant training in leadership, character, tolerance, clean living, and physical drill and development, at a cost alike to all at the lowest possible minimum commensurate with substantial living conditions and superior instruction; a staff of competent and worthy teachers and employees, supporters of our republican form of government and of the constitutions of the United States and of Texas, eligible and qualified by training and

example to teach our students, to work in their interest, and to work toward other declared objectives of the system.

3

To provide a strong and effective system of military training for male students of the main college or of any of its branches, compulsory for all except those to whom credit may be granted for active military experience or equivalent training.

4

To develop leadership in agriculture, including veterinary medicine, forestry, and wild game; in engineering, including the mechanic arts and technical and industrial training; in scientific and classical studies; and in auxiliary phases connected with the two broad fields, with the highest possible type and quality of coordinated instruction, research, and extension work.

5

To provide for such graduate instruction and such research facilities and personnel in agriculture and engineering as may be required for the maintenance and advancement thereof, or to provide any level of instruction or research needed.

6

To furnish state-wide extension services and other state-wide work in the broad phases of agriculture and engineering as may come within the range of our objectives, and the appropriate dissemination of information in these fields to the homes, the farms, the ranches, and the fields of endeavor of the people of Texas.

SCHOOLS AND DEPARTMENTS

The Agricultural and Mechanical College of Texas comprises seven schools or divisions. The Basic Division, which is a non-degree granting school, was established to aid first-year students in their adjustment to college. Satisfactory completion of the first-year program entitles the student to admission into one of the degree granting schools: the School of Agriculture, the School of Arts and Sciences, or the School of Engineering. The School of Veterinary Medicine is another degree granting school, admission to which is obtained only after completion of the program in pre-veterinary medicine and selection within the quota to be admitted for the session

under consideration. The ROTC program is under the supervision of the School of Military Science. The Graduate School assists graduate students in developing and pursuing individual educational programs. More detailed information concerning its administration and the degrees which may be earned will be found in the Bulletin of the Graduate School.

For administrative purposes the 48 departments of instruction are assigned to the several schools as follows:

School of Agriculture

Agricultural Economics and Sociology
Agricultural Education
Agricultural Engineering
Agronomy
Animal Husbandry
Biochemistry and Nutrition
Dairy Husbandry
Entomology
Floriculture and Landscape Architecture
Genetics
Horticulture
Plant Physiology and Pathology
Poultry Husbandry
Range and Forestry
Wildlife Management

School of Arts and Sciences

Biology
Business Administration
Chemistry
Economics
Education and Psychology
English
Geography
History
Journalism
Mathematics
Modern Languages
Oceanography
Physical Education
Physics

School of Engineering

Aeronautical Engineering
Architecture
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering Drawing
Geology
Industrial Education
Industrial Engineering
Mechanical Engineering
Petroleum Engineering

School of Military Science

Air Science and Tactics
Military Science and Tactics

School of Veterinary Medicine

Veterinary Anatomy
Veterinary Bacteriology and Hygiene
Veterinary Medicine and Surgery
Veterinary Parasitology
Veterinary Pathology
Veterinary Physiology and Pharmacology

LIBRARY FACILITIES

Cushing Memorial Library: Located conveniently near the center of the campus is the Cushing Memorial Library, which houses a collection now numbering over 215,000 volumes, including bound periodicals and files of federal and state documents. This library is also a designated depository for federal documents on a selective basis. The collection of foreign documents and periodicals has been supplemented greatly within the past few years. The library receives currently over 2,500 periodicals and serials, principally in English, though new foreign titles are being added from time to time; and bound files of the majority of the periodicals are kept for reference and research. Over fifty state and national newspapers are received by the library.

The library has been developed chiefly along reference and technical lines, and a good general reading collection has been accumulated. Funds from the Exchange Store and generous contributions from the A. and M. Mothers' Clubs throughout the State have been used to increase substantially the collection of fiction and non-technical popular material. The careful selection of new books keeps the collection abreast of modern thought. With the exception of periodicals, government documents, and certain books temporarily reserved by departments for reference or required reading, all books are loaned for home use for a period of two weeks with the privilege of renewal unless the book is requested meanwhile.

All of the important reference works, such as encyclopedias, dictionaries, indexing services, directories, and handbooks, are shelved in the main reading room. The Asbury Browsing Room, located on the third floor and furnished with comfortable chairs for reading, contains the fiction collection.

The Cushing Memorial Library is also the research library of the Texas Agricultural Experiment Station, which has made notable contributions to the formation of the Agricultural Collection.

During the regular session the library is open for the following hours: Weekdays, 8 a.m. to 10 p.m.; Saturdays, 8 a.m. to 12 noon; Sundays, 2 p.m. to 10 p.m. Between terms and on holidays the library is open on weekdays from 8 a.m. to 5 p.m. and on Saturdays from 8 a.m. to 12 noon.

The Texas Engineers' Library: By an act of the State Legislature in 1941, the Texas State Board of Registration for Professional Engineers was given authority to establish a

library for the professional engineers of Texas. It was voted by the members of the State Board of Registration for Professional Engineers that this library be established at the Agricultural and Mechanical College of Texas.

The Texas Engineers' Library, centrally located on the campus in the new Gibb Gilchrist Engineering Library Building, now has a collection of approximately 14,000 volumes of books and 11,000 volumes of technical periodicals. It is being developed and assembled primarily for the professional engineers of the State as a specialized technical library; however, some general reference books as well as those in some of the fields allied to engineering are included in the collection. This library now receives over 600 technical periodicals, both English and American, and maintains bound files of most of them. The library indexing services make any article readily available.

The Texas Engineers' Library is open to all members of the faculty, college personnel, and students, as well as to professional engineers of the state of Texas. The library is open from 8 a.m. to 9 p.m. on weekdays and on Saturdays from 8 a.m. to 12 noon.

Departmental Libraries: A number of the departments of the College maintain their own departmental libraries where students may find technical journals or reference books in their particular field of work. Among these is the library of the Department of Architecture. This library is located in the Academic Building and furnishes reading room space and offers reference service until 5 p.m. daily. Another is the Veterinary Library, located at the west end of the first floor of the Veterinary Medicine Building. It contains 3,808 volumes and receives 175 technical journals. These books and periodicals, covering the veterinary and allied fields, are available for student use, and a trained librarian is in charge. This library is open from 8 a.m. to 5 p.m. Mondays through Fridays, from 8 a.m. to 12 noon on Saturdays, and from 7 p.m. to 9:30 p.m. on Mondays, Wednesdays, and Thursdays.

BUILDINGS AND FACILITIES

The physical plant of the College includes buildings with a total valuation of approximately $18,260,000, while equipment and lands of the College represent an additional valuation of $11,220,000. Included among these buildings are the Memorial Student Center, the Cushing Memorial

Library, the Gibb Gilchrist Engineering Library, the College Administration Building, the auditorium, hospital, Y.M.C.A., supply store, office buildings, and laboratories for the Texas Agricultural Experiment Station, numerous classroom buildings with laboratory and shop facilities for the various departments, and many barns providing facilities for handling the various classes of livestock used in demonstration and laboratory work in the Schools of Agriculture and Veterinary Medicine. Athletic facilities consist of a stadium, field house and natatorium, baseball diamond and bleachers, golf course, and numerous tennis courts and practice fields. Twenty-six dormitories are located conveniently on the campus, and two dining halls are in operation.

ACADEMIC REGULATIONS

Certain academic regulations have been set up by the faculty for the purpose of assisting the student to secure the maximum benefit from his studies. These regulations, contained in the copy of **College Regulations** given to each student when he enters the College, serve as a guide in such important matters as choice of course and subjects, methods of study, attendance, examinations, promotion, and graduation.

By means of reports at regular intervals, frequent conferences with the deans, the Registrar, Student Affairs Office, and members of the teaching staff, the authorities of the College keep in close touch with the student's progress; and such advice and counsel are offered from time to time as seem justified in each case. For failure to keep up with his studies, the student may at any time be dropped from the rolls of the College.

The College reserves the right to modify the curricula or withdraw any course when it appears wise to do so.

DEGREES OFFERED

The following degrees are offered for the satisfactory completion of resident study in the appropriate curriculum:

Bachelor of Arts (B.A.)
Bachelor of Business Administration (B.B.A.)
Bachelor of Science (B.S.)
Bachelor of Architecture (B.Arch.)
Bachelor of Petroleum Engineering (B.P.E.)
Doctor of Veterinary Medicine (D.V.M.)
Master of Agriculture (M.Agr.)
Master of Architecture (M.Arch.)

Master of Business Administration (M.B.A.)
Master of Education (M.Ed.)
Master of Engineering (M.Eng.)
Master of Science (M.S.)
Doctor of Philosophy (Ph.D.)

On the basis of acceptable professional experience the following professional degrees in engineering are offered to graduates of the College:

Aeronautical Engineer (Aero.E.)
Agricultural Engineer (A.E.)
Architectural Engineer (Arch.E.)
Chemical Engineer (Ch.E.)
Civil Engineer (C.E.)
Electrical Engineer (E.E.)
Geological Engineer (Geol.E.)
Industrial Engineer (Ind.E.)
Mechanical Engineer (M.E.)
Petroleum Engineer (P.E.)

REQUIREMENTS FOR A BACCALAUREATE DEGREE

The appropriate degree and the diploma of the College will be conferred upon the student who has made formal application for the undergraduate degree and has satisfied the following requirements:

1. He must complete one of the regular courses of study leading to a degree.

2. The total number of grade points earned at this institution in courses applied to this degree must equal at least the number of hours which he carried in courses at this institution which are applied to this degree. Grades of F or WF shall be included, except such grades and grades of D made in the freshman year or summer session preceding that year which are subsequently repeated in this college during the student's first four semesters in college. Grades of WP shall be excluded.

3. The total number of grade points earned at this institution in courses in his major department applicable to this degree must equal at least the number of hours which he carried at this institution in his major department which are applied to this degree. Grades of F and WF shall be included, but grades of WP shall be excluded.

4. Grades made in courses elected in excess of a student's degree requirements shall be counted, but if failed such courses need not be repeated.

5. He must have settled all financial obligations to the College.

6. He must be formally recommended for graduation by the Academic Council after consideration of his complete record.

7. Unless registered in absentia or excused by the Executive Committee, he must be present in person at the graduation exercises.

These requirements must be completed and all grades on record in the Registrar's Office not later than 5 p.m. on Thursday preceding Commencement Day.

Requirements for an advanced degree are outlined in the Graduate Bulletin.

APPLICATION FOR A DEGREE

During the semester or summer session preceding the conferring of the degree, a student must be officially registered in the College. Formal application for degrees must be submitted to the Registrar, on forms provided for that purpose, not later than 90 days prior to the end of the semester, or 30 days prior to the end of the summer term, in which the student expects to complete his requirements for graduation.

In order to be a candidate for a degree at the end of a semester or summer term, a student at the beginning of that semester or term must fulfill the following two conditions:

1. He must be registered for the courses necessary to complete the requirements of his curriculum.

2. He must need a grade point ratio of no more than 1.50 in the courses for which he is registered in that semester or term to satisfy the minimum requirements of a 1.0 grade point ratio in his major field and in his entire college program.

RESIDENCE REQUIREMENT

A candidate for a bachelor's degree must complete the requirements of the final year's work of his curriculum in residence at this institution with the exception of six semester hours, which may be accepted in transfer. However, in every case the student must complete at least 36 semester hours of the last two years of his curriculum at this institution.

A candidate for a bachelor's degree in the School of Agriculture will be expected to complete approximately the

last two years in residence at this institution. Acceptance of transfer credit for courses in agriculture generally will be limited to those courses taught in the freshman and sophomore years at this institution.

TWO DEGREES

A candidate for a second bachelor's degree must have been in residence at least two academic years and must have completed all the essential work of the second curriculum not covered in the first; in all such cases the total amount required must be at least 30 semester hours additional to the greater number required for either degree.

CHANGE OF CURRICULUM

Applications for change of curriculum shall be passed upon by the deans of the schools concerned. A student under 21 years of age must have the written consent of his parent or guardian.

At the time of the change, the dean of the school to which the transfer is being made will indicate any courses on the student's record which are to be excluded from requirements for his new curriculum and will so advise the Registrar.

TRANSFER OF CREDITS

As a general policy credit will be given in transfer for work completed with a grade of C or better at another properly accredited institution. Work completed with the grade of D must be validated before it can be transferred. Validation may be by examination or by completion with a grade of C or better of more advanced work in the same subject area. Any student desiring to validate work done elsewhere should discuss with the Registrar the conditions necessary for validation of his particular work and secure from him authorization for such action. Credits given by transfer are provisional and may be cancelled at any time if the student's work in the College is unsatisfactory.

Work done in an institution not properly accredited must be validated by one of the two methods of validation already mentioned before it can be transferred.

A student who fails a course in any subject at this college and later takes such course or subsequent courses in the same subject at another college may be required to pass validating examinations in such course or courses before these will be accepted for transfer credit toward degree requirements.

CORRESPONDENCE COURSES

The Agricultural and Mechanical College of Texas offers no correspondence courses. A student in residence at this institution will be permitted to receive credit for correspondence courses taken elsewhere only when written permission has been granted in advance by the dean of his school.

Credit earned in a course completed by correspondence will be accepted only after a validating examination has been passed unless the final examination is taken under the supervision of the Registrar at this college. An exception will be made in the case of courses taken in the United States Armed Forces Institute.

Not more than twelve semester hours of credit taken in correspondence work may be applied toward the requirements for a degree.

REQUIREMENT IN GOVERNMENT

In order to meet the legal requirement for a degree from the College, a student must have credit for History 306 or its equivalent and at least three semester hours of credit in military training. For a student who does not take military training, six hours in government must be completed. Such a student must complete History 306 and History 307 or their equivalents in meeting the legal requirement for a degree.

In satisfying the requirements for a teacher's certificate, six hours of American government must be completed. Credit for basic military training can not be used in satisfying this requirement.

REQUIREMENT IN MILITARY TRAINING

All students who are citizens of the United States, physically qualified, under 21 years of age, and with freshman classification on entrance, shall be required to take two years of military training.

Students who have completed one year of service in the Armed Forces of the United States on active duty are exempt from further military training and may be given academic credit of four semester hours for basic ROTC.

Students who have served for at least one year in the Armed Forces of the United States on active duty and who hold a commission are exempt from further military training and may be given academic credit of sixteen semester hours for basic and advanced ROTC.

REQUIREMENT IN PHYSICAL EDUCATION

All students under 21 years of age at the time of entrance are required to complete Physical Education 101, 102, 201, 202.

Transfer students will be given exemption from one semester of required physical education for each semester of course work completed at the other institution.

Students who have completed as much as one year of service in the Armed Forces of the United States on active duty will be exempt from the requirement in physical education.

ELIGIBILITY FOR AN ADVANCED ROTC CONTRACT

To be considered for an advanced course ROTC contract a student must: (1) be morally and physically qualified, (2) attain junior classification, (3) have satisfactorily completed the ROTC basic course or have served at least one year of active military service.

Students are reminded that acceptance of an advanced course ROTC contract requires completion of the advanced course ROTC curriculum, completion of the ROTC summer camp, and acceptance of a reserve commission if one is tendered. The foregoing become integral parts of the degree requirements of advanced course ROTC students. Therefore, for those students under an advanced course ROTC contract, the College will not grant a degree prior to acceptance of a reserve commission. Likewise, the reserve commission will be withheld from advanced course ROTC students who have completed requirements for a reserve commission until they have completed work for their academic degree.

ENGLISH CONFERENCES

Students enrolled in courses in English composition are required to attend conferences with their instructors.

ASSEMBLIES

In most of the teaching divisions of the College, students are required to attend assemblies at intervals during the session. Prominent speakers are presented at the assemblies for the discussion of topics of general and special interest.

THE GRADING SYSTEM

Since one comes to college for an education, his grades are usually taken as an indication of the proficiency of his endeavors. The student's semester grade in a course is based upon recitation, written exercises and tests, laboratory work,

and the final examination. The final examination has a weight of one-third of the final grade, and the proportionate weight assigned to each of the other factors is determined by the head of the department administering the course.

There are four passing grades signifying various degrees of achievement, and grade points are awarded on the basis of these grades.

Grade	Description	Range (Inclusive)	Grade Points per Semester Hour
A	Excellent	92-100	3
B	Good	84 - 91	2
C	Fair	76 - 83	1
D	Passing	70 - 75	0

The lowest passing grade is 70. There is one failing grade, F, below 70, indicating work of unsatisfactory quality. Credit for a course failed may be obtained only by satisfactorily repeating the course in class, except that in a course including both theory and practice, the head of a department may excuse a student from repeating the practice if his grade in the practice is B or better, and if in the judgment of the head of the department the repetition is not necessary. The student must register for both theory and practice, however.

The temporary grade "Inc." (Incomplete) indicates that the student has satisfactorily completed the course with the exception of a major quiz, final examination, or other work. This grade is given only when the deficiency is due to authorized absence or other cause beyond the control of the student and when the work already done has been of a quality acceptable for the satisfactory completion of the course. The privilege of completing such work is limited to the end of the first month of his succeeding semester in college; otherwise the student must repeat the course in order to receive credit, unless for good reason his dean grants an extension of time.

Permission to remove a semester grade of "Inc." received because of absence from a quiz or examination may be granted by the head of the department only on receipt of official notice that the absence was authorized or evidence that the cause for the absence prevented making normal preparation to take the quiz or examination before the close of the semester.

When a student resigns or is dropped from the College after the first two weeks of a semester, the Registrar calls for his grades and enters on his permanent record the symbol

WP after each course in which he is passing and WF after each course in which he is not making a passing grade. All WF's and F's will be taken into account in determining his grade point ratio thereafter unless for cause the Executive Committee directs otherwise.

The semester grade in a subject which a student is required to drop on account of failure to keep up with the work is F.

GRADE POINT RATIO

A student's grade point ratio for any period is computed by dividing the total number of semester hours for which he received grades into the total number of grade points earned in that period. Grades of WF and F are included, but grades of WP are excluded.

Only the record made in course work for which the student was registered in this institution is used in determining his grade point ratio.

GRADE REPORTS

Preliminary Report: A preliminary report of the student's progress is sent to the parent or guardian about eight weeks after the beginning of each semester.

Semester Reports: At the close of each semester, a report of the student's work during the semester is sent directly to the parent or guardian.

Unsatisfactory Work: During the session the deans receive reports from the members of the teaching staff on students doing unsatisfactory work. These reports form the basis for personal conferences with the students concerned and for special notices to parents and guardians.

Reports to High Schools: At the close of the first semester, a report is sent to each accredited high school showing the grades made by the freshmen entering the College from that school.

DISTINGUISHED STUDENTS

A student who completes a semester schedule of at least 15 hours with no grade lower than C and with a grade point ratio of not less than 2.25 for the semester shall be designated as a "Distinguished Student." In official acknowledgment of the designation, he is issued a Distinguished Student card by the Registrar.

As a recognition of his scholastic achievement, the College allows a distinguished student to present his card to the instructor during the next succeeding semester after he distinguishes and, without requirement or privilege of making up the work missed, absent himself from any theory class except for announced quizzes provided, however, that any student who without permission of the instructor leaves a class to which he has reported shall be given a grade of zero for the day's work. This privilege may be revoked for cause at any time by the dean of the student's school.

SCHOLASTIC PROBATION

Whenever a student's cumulative record indicates that he is failing to make satisfactory progress, he is considered as scholastically deficient. The cause of the deficiency will be investigated by the dean of his school, and the student may be placed on scholastic probation of such terms as the dean shall designate, or he may be required to withdraw from the College if the deficiency warrants.

Scholastic probation is a conditional permission for a student to continue in school after he has become scholastically deficient or after he has incurred an excessive number of unauthorized absences. This permission is granted by the dean of the student's school when an analysis of the deficiency indicates that a continuation is in the best interests of the student and the College.

CLASSIFICATION

Sophomore, junior, and senior classification will be granted on completion of 30, 60, and 95 semester hours respectively.

EXCESS HOURS

After his first semester here, a student may carry not over 18 semester hours except as he earns the privilege on his record in the preceding semester in this college when he may carry 19 hours on 18 grade points; 20 hours on 22 grade points; 21 hours on 27 grade points; 22 hours on 32 grade points; 23 hours on 45 grade points; and 24 hours on 54 grade points.

The normal amount of work a student may carry in a six-weeks summer term is 6 credit hours (or 7, if one hour is practice), except that with the approval of the dean concerned, 7 credit hours (or 8, if one hour is practice) may be taken by a student who has earned at least 27 grade points in the preceding semester.

ADMISSION

APPLICATION FOR ADMISSION

Any person who wishes to enter the College should write to the Registrar, Agricultural and Mechanical College of Texas, College Station, Texas, for a formal application blank. The applicant should complete the form according to the directions printed thereon and return it to the Registrar's Office. If the applicant has attended any other institution, he must submit with his application a complete and official transcript from each institution previously attended in lieu of the high school transcript required of those with only high school attendance.

When admission requirements have been satisfied, the Registrar will then send the applicant a letter of acceptance and a physical examination form to be filled out by his personal physician. The physical examination form must be completed and returned to the College Physician. It is of the highest importance that credentials be submitted in advance of registration. If this cannot be done, the applicant should bring them at the opening of the session. Without the credentials the student cannot be admitted, and valuable time will be lost if he has to send for them after arriving at the College.

All applicants for admission to the College must be of good moral character, at least sixteen years old, and free from contagious or infectious diseases. Since the Agricultural and Mechanical College of Texas is not a coeducational institution, only men are admitted to the regular session.

A high school student who is eligible for admission to college and who wishes to enter during the summer may well consider the opportunities of combining study and recreation at the Junction Adjunct of the Agricultural and Mechanical College of Texas. Excellent studying, living, and recreational facilities are available at this beautiful Kimble County campsite in the heart of the Texas hill country. Application blanks for admission to the Adjunct may be obtained from the Registrar, Agricultural and Mechanical College of Texas, College Station, Texas.

BASIC DIVISION

The Basic Division was established to provide for the special needs of entering students and to administer their work during the first year in the College or until they

are admitted into one of the degree granting schools. The following groups of students are enrolled in the Basic Division: (1) All acceptable high school graduates entering for the first time upon their college program of studies; (2) All students transferring from other colleges and universities who are not admitted directly to one of the degree granting schools of the College; and (3) All other students who do not meet the requirements for admission to the degree granting school of their choice. These requirements are stated on page 61 of this catalogue.

METHODS OF ADMISSION

By Certificate: Graduation from an accredited secondary school, with a minimum of fifteen approved units, is required for admission by certificate to the Basic Division. These units shall include three units in English, one unit in algebra, one unit in plane geometry, two units in the social sciences, one unit in a natural science, and seven acceptable elective units. A maximum of four units in vocational subjects may be used in satisfying admission requirements. No credit is granted for work done in an accredited high school unless the applicant is a graduate of such a school. The units of social science, natural science, and elective subjects are to be chosen from the following list:

ELECTIVE UNITS

English (4th unit) 1

Mathematics:
- Advanced Algebra ..... ½ or 1
- Advanced Arithmetic ..... ½
- Solid Geometry ..... ½
- Trigonometry ..... ½

Social Sciences:
- American History ..... ½ or 1
- Ancient History 1
- Civics ..... ½ or 1
- Economics ..... ½
- English History ..... ½ or 1
- Modern History 1
- Texas History ..... ½
- World History 1

Foreign Languages:
- French ..... 2 to 4
- German ..... 2 to 4
- Latin ..... 2 to 4
- Spanish ..... 2 to 4

Natural Sciences:
- Biology 1
- Botany 1
- Chemistry 1
- General Science 1
- Physics 1
- Physiography ..... ½
- Physiology ..... ½ or 1
- Vocational Agriculture 1½
- Zoology 1

Vocational Subjects:
- Agriculture ..... 1 to 4
- Bookkeeping 1
- Com. Arithmetic ..... ½
- Com. Geography ..... ½
- Commercial Law ..... ½
- Drawing ..... 1 to 4
- Journalism 1
- Public Speaking ..... ½ or 1
- Shop Work ..... 1 to 4
- Stenography and Typing 1

A student whose ultimate objective is pursuance of a course of study in one of the fields of engineering, including agricultural engineering, is strongly advised to present two units of algebra and one-half unit of solid geometry. If such a student does not present two units of algebra, he will be required to complete Mathematics 101, Algebra. This course then will be added to the graduation requirements of this student. In addition, a student whose ultimate objective is pursuance of a course of study in one of the fields of engineering is advised to present for admission one unit of credit in physics.

An applicant for admission who is able to present a certificate of high school graduation with 15 units which do not fit the pattern as outlined above will be considered and may be admitted with conditions. Such a student may be required to do additional work in college to make up for the subject matter shortage.

By Examination: Any or all of the scholarship requirements for admission may be met by passing the entrance examinations. These will be held at the beginning of each semester under the supervision of the College authorities and will cover all the subjects required or accepted for admission as outlined above. Candidates desiring to take examinations at the College should notify the Registrar well in advance of registration.

By Individual Approval: An applicant over twenty-one years of age who has not recently attended school and who cannot satisfy the entrance requirements in full may be admitted without examination, subject to the following requirements:

1. He must make application on the official entrance blanks.

2. He must furnish evidence that his preparation is substantially equivalent to that required of other applicants and that he possesses the ability and seriousness of purpose necessary to pursue his studies with profit to himself and to the satisfaction of the College.

3. He must show by a test in composition that he has an adequate command of the English language.

4. The candidate should forward his credentials to the Registrar in advance of his coming, but in no case will he be admitted without a personal interview.

A student admitted by individual approval will not be considered a candidate for a degree until he has satisfied the entrance requirements in full.

Of Superior Students: Any superior student, as indicated by his entrance tests and his high school record, who presents evidence of outstanding preparation in any subject matter field may be relieved of the introductory course in that field and permitted to substitute another course with the approval of the dean of his school provided he passes a validating examination in the course with a grade of C or better.

To Advanced Standing: Admission to advanced standing may be granted under the following conditions:

1. The candidate must present evidence of honorable dismissal from the institution last attended.

2. An official transcript of the record of all previous high school and college work must be submitted, together with a marked catalogue showing the college courses referred to in the transcript.

3. On the basis of these credentials, credit will be given for work completed with a grade of C or better, so far as the work is equivalent in character and extent to subjects included in the course of study to be pursued here. Credits given by transfer are provisional and may be cancelled at any time if the student's work in the College is unsatisfactory.

4. An applicant for admission who is not a resident of Texas and who has attended another college or university must be eligible to return to that institution and also must have for each of the last two semesters of attendance a grade point average of 1.00 (C-average) or better on all courses undertaken whether passed or failed.

5. A Texas resident who has attended another college or university must be eligible to return to that institution. In addition, a student who has attended a previous institution for:

(a) one semester must have passed at least nine hours and made at least nine grade points.

(b) two semesters must have passed a total of at least 18 hours and made at least 18 grade points, of which at least 12 hours and 12 grade points must have been earned in the last semester.

(c) three semesters must have passed a total of at least 33 hours and made at least 33 grade points, of which

at least 12 hours and 12 grade points must have been earned in the last semester.

(d) four or more semesters must have for the last two semesters of attendance a grade point ratio of 1.00 (C-average) or better in all courses undertaken whether passed or failed, of which 15 hours and 15 grade points must have been completed in his last semester.

(e) Applications of students failing to meet the above requirements will be considered on their merit.

6. Those students who transfer from another institution with less than 40 acceptable semester credit hours and 40 grade points will be enrolled in the Basic Division unless they meet the requirements for admission to one of the degree granting schools. These requirements are stated on page 61 of this catalogue.

7. A continuing unsatisfactory scholastic record will be considered grounds for refusing admission.

An applicant, whether a new student applying for admission for the first time or a former student of the College who has attended another college or university, is not at liberty to disregard any part of his academic record and apply for admission to the College on the basis of his high school record or a partial record of his college work.

It is essential that all credentials be forwarded to the Registrar well in advance of registration day.

College credit for work done in secondary schools will be given only on the basis of examination at the College and shall not include work presented in satisfaction of the entrance requirements.

8. Candidates for a baccalaureate degree in the School of Agriculture will be expected to complete approximately the last two years in residence at this institution. Acceptance of transfer credit for courses in agriculture will generally be limited to those courses normally taught in the freshman and sophomore years at this institution.

Of Special Students: A limited number of young men over twenty-one years of age may be admitted to the College as special students, not candidates for a degree, subject to the following regulations:

1. The applicant must show good reason for not taking a regular course and must submit satisfactory evidence that he is prepared to profit by the special studies he wishes to pursue.

2. Record of his previous scholastic work must be submitted on the official entrance blanks and must be accompanied by a statement showing (1) his experience; (2) a plan of study, enumerating the courses he desires to pursue; and (3) the purpose or end expected to be accomplished by his study.

3. In order to be admitted to the work of any department, a special student must secure the consent of the head of the department; and his course of study as a whole must be approved by the dean concerned.

Special students are subject to the rules and regulations governing regular students.

A special student who may desire to become a candidate for a degree must satisfy the entrance requirements and obtain the consent of the dean concerned.

To One of the Degree Granting Schools: A student may transfer from the Basic Division or from another college or university to one of the degree granting schools of the College, or into the pre-veterinary medicine curriculum, when he has earned 26 semester hours and 26 grade points within two regular semesters, or 40 semester hours and 40 grade points in three regular semesters, or 54 semester hours and 54 grade points in four regular semesters. Transfer of students who meet these requirements by additional work in summer school or by correspondence shall be subject to the approval of the Dean of the Basic Division.

Of Nonresident Students: 1. An applicant for admission who is not a resident of Texas and who has attended another college or university must be eligible to return to that institution and also must have for each of the last two semesters of attendance a grade point average of 1.00 (C-average) or better on all courses undertaken whether passed or failed.

2. A limited number of high school graduates with satisfactory records will be accepted from nearby states so long as facilities may be available.

3. Students who are admitted to the College in one curriculum may not be permitted to change to another which is restricted except under the same conditions as apply to new students.

4. The status of the residence of a student is determined at the time of his first registration in the College, and his residence is not changed by his sojourn at A. and M. as a student. His residence may not thereafter be changed by him, but, in the case of a minor, it may be changed by his parents, should they move to and become legal residents of the State and maintain such residence for at least one calendar year.

REGISTRATION

Every student is required to register when he first enters the College and thereafter at the beginning of each semester. Dates of registration for the sessions of 1954-55 and 1955-56 are shown on pages 2-5 of this catalogue.

Registration is not complete until the student pays his fees for the ensuing semester; reports to ROTC headquarters for assignment to an organization; reports to the Chief of Housing for assignment to a room or to report his place of residence if not living in a dormitory; and returns his assignment card, properly approved, to the Registrar's Office, where his receipt showing payment of fees will be stamped, "Registered in the Registrar's Office."

EXPENSES

The expenses for a regular session of nine months will vary with the individual concerned and with the course of study pursued. In the case of new students the total cost should range between $700.00 and $925.00. In general these amounts include four types of expenses as follows: fees payable to the College Fiscal Department (matriculation fee, medical fee, student activities fee, board, room rent, laundry, and room key deposit); textbooks and supplies; clothing, including a two-year supply of physical education uniform, and military uniform to supplement that furnished by the government; and personal incidental expenses, estimated to range between $100.00 and $200.00 depending upon the individual concerned.

The total expenses for returning students during a regular session should be somewhat less than those amounts indicated for new students.

The fees for board, room, and laundry listed for the session of 1954-55 may be changed during the year if economic conditions make it absolutely necessary. Expenses for the session of 1955-56 will be approximately the same, though exact figures cannot be supplied until the spring of 1955.

Fees payable to the Fiscal Department:

	First Semester to Begin Sept. 17, 1954	Second Semester to Begin Feb. 4, 1955
Matriculation Fee (See Note 4.)	$ 25.00*	$ 25.00*
Medical Service Fee (See page 71.)	5.50	5.00
Student Activities Fee (See page 71.)	21.90	†
Board	142.70	142.65
Room Rent	45.00	40.35
Laundry	12.85	13.00
Room Key Deposit, returnable	1.00	
Total payable to Fiscal Dept.	$253.95	$226.00
Textbooks and supplies are variable with classes and courses—about	40.00	30.00
Total general expenses—about	$293.95	$256.00

All fees except room rent, board, and laundry are payable in full at the beginning of the semester; these fees may be paid in installments as shown below. The last three installments for each semester are due on the dates shown below; the fees for delayed payments shall be $1.00 per day extra for each day of delayed payment of fees for board, room rent, and laundry or for either of these fees. Students who are delinquent five days will be dropped from the rolls.

All members of the cadet corps living in the dormitories are required to pay the fees for board and laundry in addition to the fees for room rent. Students living in the dormitories who are not members of the cadet corps are required to pay the fees for room rent and laundry in addition to the other required fees. Changes from dormitory student to day student will be made only on the last day of installment payments for room, board, and laundry.

Meals for other than members of the cadet corps will be served only at the cafeteria in Sbisa Hall.

INSTALLMENT PAYING: The general expenses listed above may be paid in installments as follows:

FIRST SEMESTER

1. First installment, payable on entrance, September 17-18
   To Fiscal Department:
   Matriculation Fee (See Note 4.) ..... $ 25.00*
   Medical Service Fee (See page 71.) 5.50

*The matriculation fee for nonresident students is $150.00 per semester.
†For those students who did not pay the optional fee during the first semester the fee is $11.55.

(Continued from preceding page)

Student Activities Fee (See page 71.)	21.90
Board to October 22	44.30
Room Rent to October 22	12.00
Laundry to October 22	3.85
Room Key Deposit, returnable	1.00
Total payable to Fiscal Department	$113.55
Textbooks and supplies, variable with classes and courses—about	30.00
General expenses, first installment—about	$143.55

2. Second installment, payable October 1-22
To Fiscal Department:

Board to November 24	$ 39.35
Room Rent to November 24	10.65
Laundry to November 24	3.45
Total payable to Fiscal Department	$ 53.45

3. Third installment, payable November 1-24
To Fiscal Department:

Board to December 17 (Thanksgiving recess excluded)	$ 24.60
Room Rent to December 17	8.00
Laundry to December 17	2.55
Total payable to Fiscal Department	$ 35.15

4. Fourth installment, payable December 1-17
To Fiscal Department:

Board to January 29 (Christmas recess excluded)	$ 34.45
Room Rent to January 29	14.35
Laundry to January 29 (Christmas recess excluded)	3.00
Total payable to Fiscal Department	$ 51.80
Total general expenses, first semester	$293.95

SECOND SEMESTER

1. First installment, payable on entrance
February 4-5, 1955
To Fiscal Department:

Matriculation Fee (See Note 4.)	$ 25.00*
Medical Service Fee (See page 71.)	5.00
Student Activities Fee (See footnote on page 63.) †	

*The matriculation fee for nonresident students is $150.00 per semester.

(Continued from preceding page)

Board to February 22	23.35
Room Rent to February 22	6.35
Laundry to February 22	2.05
Total payable to Fiscal Department	$ 61.75
Textbooks and supplies, variable with classes and courses—about	20.00
General expenses, first installment—about	$ 81.75

2. Second installment, payable February 1-22
To Fiscal Department:

Board to March 22	$ 34.45
Room Rent to March 22	9.35
Laundry to March 22	3.00
Total payable to Fiscal Department	$ 46.80

3. Third installment, payable March 1-22
To Fiscal Department:

Board to April 26 (Spring recess excluded)	$ 36.90
Room Rent to April 26	11.65
Laundry to April 26	3.75
Total payable to Fiscal Department	$ 52.30

4. Fourth installment, payable April 1-26
To Fiscal Department:

Board to June 4	$ 47.95
Room Rent to June 4	13.00
Laundry to June 4	4.20
Total payable to Fiscal Department	$ 65.15
Total general expenses, second semester	$256.00

ADDITIONAL EXPENSES FOR NEW STUDENTS

In addition to the general expenses shown above, new students will have the following expenses when registering for the first time:

Uniform (See Note 1.)—about	$ 50.00
Physical education uniform (See Note 2.)—about	20.00
Slide rule and drawing instruments for engineering students (See Note 3.)	$38.00 to 53.00
Room key deposit, returnable	1.00

For new students registering the second semester, February 4, 1955, extra for books and supplies—about	10.00
For new students who report for the first semester on September 10 for New Student Week, add:	
Board	8.60
Room Rent	2.35
Laundry	.75

NOTES: 1. Members of the ROTC will be furnished most of their uniform equipment. Cadets will find it necessary to supplement the uniform issued by purchasing the following articles, the approximate cost of which at the College Exchange Store is as follows: one pair of wool elastique O.D. dark trousers ($22.50); two pairs of cotton khaki trousers ($5.95 each); collar ornaments ($2.00); two cotton khaki officer style shirts ($4.50 each); one wool elastique garrison cap ($2.25); one cotton khaki garrison cap ($1.00); and four pairs of tan cotton socks ($0.55 per pair). Cadets will pay a handling charge of $5.00 per year to cover the cost of issuing, receiving, and record keeping of Government uniforms issued. Since only approved articles of uniform may be worn, new students should purchase uniforms after arrival at the College.

To defray the cost of additional billing and delayed handling, a charge of ten per cent of the value of uniform articles turned in subsequent to five days following the close of school, with a minimum charge of $1.00, will be made.

The College operates a store for the purpose of supplying necessary articles to students. The store carries in stock textbooks, stationery, drawing instruments, toilet articles, and other supplies. All merchandise is sold at the usual retail prices prevailing in the area. Upon recommendation of the Exchange Store Advisory Board, any profit created from the operation of the Exchange Store may be used for student welfare and other purposes of benefit to the entire student body. The Exchange Store supplies all books and supplies to veteran students under the terms of the contract between the College and the Veterans Administration.

2. All students taking required physical education will be required to have the following items: 2 pairs boxer type gym trunks with Aggie emblem, 2 T shirts with flocked emblem, 3 pairs gym socks, 1 pair canvas shoes—rubber sole, 1 sweat shirt with flocked emblem, 1 pair sweat pants, and 1 athletic supporter. These items may be secured at the College Exchange Store for an approximate cost of $20.00.

3. The slide rule is one of the most important time saving instruments of engineers. For use throughout the college course the LL Decitrig Duplex is suggested. Such a rule costs about $22.50. The cost of the drawing instruments needed by engineering students will range from $15.00 to $30.00 depending on quality.

4. For matriculation fee of nonresident students, see paragraph below. Former students who in either semester do not register on the days set apart for that purpose pay an additional matriculation fee of $2.00.

5. New students, or former students not in school during the preceding semester, may file room reservation applications beginning June 16 for the first semester; October 16 for the second semester. A deposit of $6.00 must accompany all dormitory reservations, which will apply on the room rent payable on entrance and for the key deposit. Deposits on room rent for the first semester are not refundable after August 15; for the second semester, after January 15. Application blanks for room reservations will be furnished by the Registrar.

DAY STUDENTS

Day students pay all specified fees and charges except board, laundry, room rent, and room key deposit.

GRADUATE STUDENTS

A graduate student, except a full-time staff member, is required to pay the matriculation fee, student activities fee, and medical service fee. In the event of registration for the thesis only, he is charged a matriculation fee of $7.50. He also pays the regular charges for laundry and room rent if he resides in a College dormitory. Full-time staff members pay matriculation fee only.

PART-TIME STUDENTS

A student registering for less than twelve credit hours is required to pay a matriculation fee of $2.00 per credit hour with a minimum fee of $7.50.

NONRESIDENT STUDENTS

The residence status of a student is determined at the time of his first registration in the College, and his residence is not changed by his sojourn at A. and M. College as a student

except as provided by law. This policy shall apply to both graduate and undergraduate students regardless of any scholarships, student assistantships, or graduate assistantships that may be granted to any student.

In compliance with the State law, the matriculation fee for nonresident students is $150.00 per semester. A nonresident student is hereby defined to be a student of less than twenty-one years of age, living away from his family and whose family resides in another state, or whose family has not resided in Texas for the twelve months immediately preceding the date of registration; or a student of twenty-one years of age or over who resides out of the State or who has not been a resident of the State twelve months subsequent to his twenty-first birthday or for the twelve months immediately preceding the date of registration. A nonresident student registering for less than twelve credit hours is required to pay a matriculation fee of $12.50 per credit hour.

The term "residence" means "legal residence" or "domicile"; and the term "reside in" means "domiciled in."

The legal residence of one who is under twenty-one years of age is that of the father. Upon death of the father, the legal residence of the minor is that of the mother. Upon divorce of the parents, the residence of the minor is determined by the legal residence of the person to whom custody is granted by the court. In the absence of any grant of custody, the residence of the father continues to control. Upon death of both parents, the legal residence of the minor continues to be that of the last surviving parent until he becomes twenty-one unless he makes his home with his grandparents, whereupon their residence is controlling.

A student under twenty-one years of age shall not be classified as a resident student until his parents shall have maintained legal residence in this state for at least twelve months. A student under twenty-one years of age whose parent leaves the State and establishes legal residence in another state shall be classified as a nonresident student. It shall be the responsibility and duty of the student to submit legal evidence of any change of residence.

All individuals who have come from without the state of Texas and who are within the State primarily for educational purposes are classified as nonresidents. Registration in an educational institution in the State is evidence that residence is primarily for educational purposes even though such indi-

viduals may have become qualified voters, have become legal wards or residents of Texas, have been adopted by residents of Texas, or have otherwise attempted to establish legal residence within the State.

A student twenty-one years of age or older who comes from without the State and desires to establish a status as a resident student must be a resident of the State for a period of at least twelve months other than as a student in an educational institution and must have the intention of establishing a permanent residence within the State during the entire period.

All aliens shall be classified as nonresident students except that an alien who has applied for naturalization in the United States and has received his first citizenship papers shall have the same privilege of qualifying as a resident student as a citizen of the United States. The twelve months' residence required to establish the status of a resident student shall not begin until after such first citizenship papers have been issued to the alien.

Members of the Army, Navy, or Marine Corps of the United States who are stationed in Texas on active military duty shall be permitted to enroll their children by paying the tuition fees and charges provided for resident students without regard to the length of time such member of the Armed Service shall have been stationed on active duty within the State. This provision shall extend only during active military service in Texas; and upon such member of the Armed Service being transferred outside the state of Texas, his children shall be classified as to residence under the second paragraph of these regulations. Any student claiming the privilege of this section shall submit at each registration a statement by the commanding officer of the post or station at which his parent is on active duty verifying the fact of his parent's military status.

Appointment as a member of the teaching or research staffs or the holding of a fellowship, scholarship, or assistantship shall not affect a student's residence status or the tuition fee to be paid.

It shall be the responsibility of the student to pay the correct fee at the beginning of each semester or term for which he may register, and a penalty of $5.00 shall be assessed for failure to pay the proper fee.

PAYMENTS

Payments to the Fiscal Department should be made by cashier's check or money order, payable to the Agricultural and Mechanical College of Texas. All checks, money orders, and drafts are accepted subject to final payment. Personal checks will not be accepted.

REFUNDS

Any student withdrawing officially (a) during the first week of class work in a semester will receive a refund of four-fifths of the matriculation fee and medical fee; (b) during the second week of class work, three-fifths; (c) during the third week of class work, two-fifths; (d) during the fourth week of class work, one-fifth; (e) after the fourth week of class work, nothing. No refunds will be made until ten days have elapsed from the time the fees were paid.

A refund of board and laundry payment will not be made unless there is a consecutive absence of not less than ten days due to illness of the student or a member of his family, or for some other unavoidable cause.

Students withdrawing during the first week of the Fall Semester will receive a 100% refund of the Student Activities fee. Students withdrawing after the first week of the Fall Semester and before the end of the first week of the Spring Semester, will receive a refund of $6.55 and will be entitled to receive a copy of the student annual. Students withdrawing after the first week of the Spring Semester will receive no refund.

Students not enrolled in the first semester and withdrawing during the first week of the Spring Semester will receive a 100% refund of the Student Activities fee. No refund will be made to students withdrawing after the first week, but the student will be entitled to receive a copy of the student annual.

DEDUCTIONS

No deductions will be made from charges for board, laundry, and room rent in case of entrance within ten days after the opening of a semester, nor will a refund be made in case of withdrawal during the last ten days of a semester or the last ten days for which payment is made.

UNPAID CHECKS

If a check or draft accepted by the Fiscal Department is returned unpaid by the bank on which it is drawn, the person presenting it will be required to pay a penalty of $1.00.

DUPLICATE RECEIPTS

Duplicate receipts covering fees paid by students will be issued on payment of twenty-five cents.

MATRICULATION FEE

The matriculation fee, fixed by the State law, includes the cost of necessary classroom and laboratory supplies and entitles the student to the usual college privileges, including the use of the library.

MEDICAL SERVICE FEE

The medical service fee is required of all students living in College housing and covers the professional services of the college physician and the hospital staff. Surgical operations and charges for consultations with outside physicians requested by parents are not included in the medical fee.

ROOM RENT FEE

Rooms are furnished with single bedsteads, mattresses, tables and chairs, and running water. The charge for room rent also includes heat, light, and cleaning the corridors but not the rooms.

STUDENT ACTIVITIES FEE

The optional student activities fee includes subscription to the Battalion newspaper, admission to all athletic events, the College annual, and the Town Hall program.

VOCATIONAL REHABILITATION PROGRAM

The Texas Education Agency, through the Division of Vocational Rehabilitation, offers payment of tuition and other services to civilian students who have certain physical handicaps, provided the vocational objective selected by the student has been approved by a representative of the Division. Application for Vocational Rehabilitation should be made to the Division of Vocational Rehabilitation, Room 412, Varisco Building, Bryan, Texas, or to Mr. J. J. Brown, Director, Division of Vocational Rehabilitation, Capitol Station, Austin, Texas.

STUDENT LIFE

SUPERVISION AND DISCIPLINE

The over-all supervision of student life is the responsibility of the Dean of Men. The Commandant of Cadets is directly responsible for the maintenance of military discipline within the Corps of Cadets, while the supervision of civilian students is the direct responsibility of the Dean of Men.

The student government of the College is carried out through the Student Senate, which is composed of 43 senators. These senators are elected by the student body and are from the freshman, sophomore, junior, and senior classes, from the day students, from the veterans, and from the civilian students on a system of prescribed representation.

The Student Life Committee is a faculty-student committee of the Academic Council organized for the purpose of considering policies and procedures affecting student life and making recommendations concerning them. It shall concern itself with those matters relating to student life which are not specifically assigned to some other committee or agency. It is composed of ten faculty and staff members and eleven students. The staff representatives are selected from all phases of the school program and the students represent all student groups on the campus.

The Memorial Student Center Council is charged with the organization and operation of the activities and events within the Center.

The rules of conduct by which every student is expected to live while attending the A. and M. College are contained in the BASIC POLICY, a copy of which follows:

BASIC POLICY

The Board of Directors finds it necessary to assert the basic principles to govern student life and staff-student relationship at the A. and M. College of Texas.

The College accepts responsibility for the curricular work of the student and for his conduct and development. The term "College" as used here embraces the Board of Directors, the President, the faculty, all personnel of the A. and M. system, the student body, former students, and all the worthy traditions of the institution.

Every student is expected at all times to recognize constituted authority, to conform to the ordinary rules of

good conduct, to be truthful, to respect the rights of others, to protect private and public property, and to make the best use of his time toward an education.

Every student has rights which are to be respected. They include the right of respect for personal feelings, the right of freedom from indignity of any type, the right of freedom from control by any person except as may be in accord with published rules and regulations of the College, and the right to make the best use of his time and his talents toward the objective which brought him to this institution. No officer or student, regardless of position or rank, shall violate those rights. No custom or regulation in conflict will be allowed to prevail.

It shall be the duty of every person employed by this institution to conform to this policy; to cooperate with all agencies of the College and with the student body, individually and collectively, in carrying out its provisions. Personal responsibility in this respect will be primary.

THE OFFICE OF DEAN OF MEN

Responsibility for the development and welfare of the student other than academic is placed with the Office of the Dean of Men. One of the principal objectives of the office is the improvement of living conditions of the student body. Another objective is to encourage and recognize outstanding performance in student leadership, extracurricular activities, and all worthwhile endeavors which will aid the student in becoming a well-rounded citizen. The Dean consults and works with parents and guardians of all students, as well as with groups of students. It is also the policy of this office to work closely with other departments and agencies on the campus, so that the best possible service may be rendered to the student body. The Office of the Dean of Men is in Room 102, Goodwin Hall.

STUDENT AFFAIRS

The office of the Assistant Dean of Men for Student Affairs coordinates the activities and functions of the Veterans Advisor's Office, the Housing Office, the Counselors for non-military dormitories, the Campus Security Office, and the Student Labor and Loan Office.

VETERANS ADVISORY SERVICE

The A. and M. College of Texas has provided a Veterans Advisor to assist ex-servicemen and their families with their

problems. His office is located in Room 102 of Goodwin Hall. The Veterans Advisor and his staff are sincerely interested in every problem of the veteran and welcome his inquiries by correspondence or by personal office calls.

HOUSING AND MEALS

Unless they are living with their families, all students are required to live in College-owned dormitories on the campus. Dormitories are designed especially to meet the student's needs of living and study.

Reservations are filed in the order in which they are received and will be held only until 3 p.m. of the regular registration day. Reservations made by students who do not complete their registration on the regular registration day by 5 p.m. may be cancelled, and the space will be assigned to another applicant.

New students may file room reservation applications beginning March 1 for the summer session, June 16 for the fall semester, and October 15 for the spring semester. As soon as a new student has been accepted for admission, he will be mailed a room reservation request card, which should be filled out as directed and returned to the Fiscal Office with a check or money order for $6.00 for room reservation fee and key deposit. As soon as the reservation has been made, the student will be notified of his assignment to dormitory space. The room reservation fee will be credited to the student as part of his first installment of room rent upon his registration in June, September, or February. Should a student decide that it will be impossible for him to register, he may have his reservation cancelled not later than May 15 for the summer session, August 15 for the fall semester, and January 15 for the spring semester, and the fees will be returned. Cancellations made after these dates will result in a forfeit of the reservation fee. The room assignment card and room reservation fee receipt will be secured at the Housing Office, 100 Goodwin Hall, when the student reports for registration.

Three housing areas have been designated on the campus: one known as the Basic Division area, one as the Corps area, and one as the Non-Military Area. All first-year Basic Division students will live in dormitories located in the area designated for that division. Sophomore students who elect to live with the Corps of Cadets and all juniors and seniors who have R.O.T.C. contracts will live in the Corps Area.

Graduate students, students not physically qualified for military training, transfer students above freshman classification who do not elect to take military training, veterans exempt from military training, and sophomores who elect to live in non-military dormitories will be housed in the Non-Military Area.

Freshmen will be organized into their own military units and will be housed by these units. Members of the three other classes who are in the Corps of Cadets will be housed by military units. Sophomore students who choose to live in non-military dormitories but are not exempt from military training will wear the uniform habitually and participate in military classes and drills as do those who live with the Corps of Cadets.

All cadets residing on the campus are required to take their meals in one of the two dining halls on the campus. Each has a seating capacity of 4,000 and furnishes the students at cost well-balanced meals prepared under the direction of experienced supervisors.

Those students who are not members of the Cadet Corps may eat all their meals in the College cafeteria at the same rate of pay as the meals in the dining halls, provided sufficient numbers desire this service to justify the operation. They may take their meals elsewhere if they so desire.

The College operates 526 apartments for married students, with first priority given to ex-servicemen. More complete information about these apartments and application forms for them may be obtained from the Chief of Housing, 100 Goodwin Hall.

REGISTRATION OF CARS

All students and employees who drive automobiles on the campus must have them registered in the Office of Campus Security, Room 108 Goodwin Hall, within 48 hours of the time they are brought on the campus.

COLLEGE HEALTH SERVICE

The services of the College Medical Department become available to the student as soon as he has registered and paid the medical fee. Besides providing medical care and advice at all times during the college session, the Department treats cases of acute illness as they appear and supervises the maintenance of healthful living conditions at the College.

The College Hospital is a modern brick building, steam heated, with 150 beds for patients. Students are given hospitalization, including room, board, general nursing service, doctor's service, and medicine. The X-ray department provides all necessary picture and fluoroscopic work, including that for teeth, chest, and bones. The clinical laboratory makes blood examinations, urine examinations, smears, and cultures. The physiotherapy department provides heat treatments by means of ultra-violet, diathermy, and infra-red lamps. One doctor, ten nurses, two technicians, one bookkeeper, and two student assistants compose the Department staff.

The water of the College is supplied through a College-owned water supply system and comes from four deep wells located nine miles northwest of the College campus. As a part of the sanitary work carried on throughout the entire year, the College laboratories make bacteriological checks of this water supply and of the milk supply at regular intervals.

All College buildings are located on the crest of a wide divide with sufficient slope in every direction to insure proper drainage. The three units of dormitories are modern and comfortable, located in spacious and beautifully landscaped areas on the campus. The dormitories, as well as the College swimming pool and other places frequented by the students, are inspected at regular intervals.

The College is particularly concerned with the maintenance of the health and physical development of its students. It provides one of the finest indoor swimming pools in the State, as well as tennis courts, a golf course, athletic fields, and physical training.

RELIGIOUS ACTIVITIES

Religious Services: In addition to the college Y.M.C.A. staff, there are eight churches near the campus whose primary purpose is to serve the spiritual needs of the students. The campus religious leadership is deeply conscious that the students are in perhaps the most formative period of their lives and feel keenly the responsibility for their spiritual development.

The programs of the respective churches are aimed primarily to meet the student needs. Many of the churches have distinct student departments with specialized leadership whose sole responsibility is that of ministering to the students. The pastors of the churches also give as much time as is necessary to the students for personal counselling.

The churches serving the campus have a program similar to that of the home church with an expanded young people's department and dominant emphasis upon student interests. In addition to the special student emphasis, they have the customary Sunday worship periods, church schools, and young people's organizations promoted to stimulate clear and constructive thinking in the important field of religion. The student departments are expanded to offer wholesome recreation and social life and social service.

One week during each year is designated officially by the College administration as Religious Emphasis Week, in which the entire College cooperates, making it possible to have an outstanding religious leader to address voluntary convocations of the students. The administration of the College, knowing the value of developing the spiritual aspects of the personality of the student, authorizes an adjustment of the College program so as to permit all students to attend.

Courses in Religious Education: The Baptist General Convention of Texas; the Church of Christ; the Board of Missions of the Episcopal Church, Diocese of Texas; the B'nai B'rith Hillel Foundation; the Texas Methodist Student Movement; the Division of Student Service, the National Lutheran Council; and the Presbyterian Church, U.S. and U.S.A., upon approval of their respective boards, have been authorized to offer courses in religious education open to students of junior and senior classification.

The courses offered according to this plan are as follows:

305. Old Testament Character Studies. (1-0). Credit 1.

Through a chronological study of many characters in the Old Testament, the student becomes acquainted with experiences in the lives of these characters, through which is revealed the righteous and omnipotent God of the Old Testament.

306. New Testament Character Studies. (1-0). Credit 1.

After a brief introduction to the New Testament giving the political, social, moral and religious situation at Jesus' birth, the course will pursue a character study of key personalities in the New Testament and their contribution to the Christian system of thought.

309. Early Old Testament History. (1-0). Credit 1.

Story of Bible history as recorded in first five books; study divided into five periods between the Creation and the Wilderness wanderings.

310. Later Old Testament History. (2-0). Credit 2.

Periods of Bible history studied include: conquest of Canaan, the Judges, the united Kingdom, the divided Kingdom, Judah alone, the exile, and return from exile.

311. The Synoptic Gospels. (2-0). Credit 2.

A study of the first three Gospels, Matthew, Mark, and Luke, with emphasis upon the contribution of each to our knowledge of the life and teachings of Jesus.

312. The Gospel of John. (1-0). Credit 1.

This course is a detailed study of the life and teachings of Jesus as reported in the fourth Gospel. Special attention is given to interpretation of Jewish customs and institutions for the non-Jewish (Greek) readers.

313. Survey of the New Testament. (2-0). Credit 2.

Each book of the New Testament is studied with reference to its content, author, purpose, unique characteristics, and the historical background which provided the occasion for its writing.

314. Survey of the Old Testament. (3-0). Credit 3.

Each book of the Old Testament is studied in light of the historical background of the Hebrew people and the development of their relationship with God.

317. The Minor Prophets. (2-0). Credit 2.

Here the student confronts the messages of prophets through whom God said much with few words: Amos, Hosea, Mica, Zephaniah, Nahum, Habakkuk, Obadiah, Haggai, Zechariah, Jonah, Malachi, and Joel.

318. The Book of Acts. (1-0). Credit 1.

Chapter by chapter study of Acts; founding and spread of church in Jerusalem, Judea, Samaria; Paul's travels; church among the Gentiles.

319. The Epistles of Paul. (2-0). Credit 2.

A study of the life and thought of Paul as found in the Book of Acts and Pauline correspondence. A history of the primitive church as reflected in these writings.

320. The Book of Revelation. (1-0). Credit 1.

This book is studied in the light of the persecution of Christians in the Roman Empire, and as an apocalyptic writing to serve in strengthening their faith and loyalty to Christ who sent them the message.

321. The General Epistles. (1-0). Credit 1.

A study of the "open letters" written by James, John, Peter, and Jude to the early Christian Churches, comparing their messages to the recorded words of Jesus relative to the situation and problems of their day and ours.

323. The Life of Jesus. (3-0). Credit 3.

In this course on the life of Christ, the four Gospels are studied with the passages in the four books arranged in chronological sequence so as to give a connected account of the life of Christ and to reveal similarities and differences in the four books.

324. The Major Prophets. (3-0). Credit 3.

A history of the prophetic movement from 750 B.C. to the time of the Maccabees. Special attention given to Isaiah, Jeremiah, and Ezekiel.

325. The Book of Job. (2-0). Credit 2.

The book of Job is one of the great books of all time. It offers in interesting form a thorough study of the problem of suffering.

326. The Psalms. (2-0). Credit 2.

This study of the book of psalms includes a glance at Hebrew poetry; the source and background of certain of the Psalms—interpretation and beauty of structure and composition.

327. An Introduction to the Bible. (2-0). Credit 2.

A course to acquaint the student with the Bible showing its unity and the continuity existing between the two Testaments by the study of representative sections of both the Old and New Testaments together with their historical settings and their relationship to each other.

329. Proverbs. (1-0). Credit 1.

This study of the book of Proverbs includes authorship, date of writing, and a close study of the practical wisdom contained in the proverbs, of which the book is full.

330. Ecclesiastes and the Song of Solomon. (1-0). Credit 1.

A study of two neglected books of the Bible—their contents, interpretation, and significance.

335. Comparative Religions. (2-0). Credit 2.

A study of the most popular contemporary religions of the world as channels through which men have tried to find the meaning of life and to relate themselves to its values. It includes Budhism, Confucianism, Mohammedanism, Judaism, and Christianity.

A maximum of six semester hours in religious education courses may be credited toward a degree.

Young Men's Christian Association: For the many services rendered to the students, the Y.M.C.A. holds a coveted spot in the hearts of all Aggies. The Y.M.C.A. Building, erected in 1912 from funds given by the ex-students and friends of the College, is a four-story structure in the center of the campus. It provides a small chapel for religious services; lounges used for the meeting of students, friends, and visitors; office space and conference rooms; and a few dormitory rooms for unmarried teachers. In the basement are located recreational facilities.

The Y.M.C.A. carries on a varied and vigorous program of religious group meetings, Bible study, discussion groups in the dormitories, and similar activities to maintain and stimulate the moral and spiritual lives of the students. By participating in this program and fellowship, the boys develop fine qualities of leadership.

STUDENT ACTIVITIES

Office of Student Activities: The Office of Student Activities is charged with the management and fiscal operation

of many student activities. This office is concerned primarily with student publications, musical activities, Town Hall, Guion Hall Theater, social activities, candy concessions, clubs, the golf course, and intramural athletics. The profits realized through management of these operations are returned to the student body in the form of recreational facilities, entertainment, and grants to recognized student groups and organizations for approved projects, such as judging teams, conventions, speakers, and others considered to be in the interest of the student body. The Office of Student Activities utilizes all resources at its command to stimulate and enrich the student life.

The Office of Student Activities is located in Room 209, Goodwin Hall.

Student Publications: The Battalion is the students' newspaper, which they edit and produce. It is the official paper of the A. and M. College of Texas and of the city of College Station. The co-editors of the paper are elected by the student body. Students who begin work as freshmen or sophomores as a rule become paid employees in editorial capacities during their senior year. Students are urged to join the staff in their freshman year.

The Aggieland is the yearbook of the student body. Many opportunities for participation are available because of the amount of work necessary to produce a complete record of the school year. The annual is produced under supervision of the Manager of Student Publications.

The Engineer, designed to promote talent for technical writing, is published by students in the School of Engineering. The editor is selected by the Student Engineering Council, and the staff is appointed by the editor. Students who have ability in research, in reporting scientific material, and in creative writing are welcomed as members of the staff.

The Agriculturist is published by the students of the School of Agriculture. The editor is selected by the Agricultural Council, and staff members are recruited from volunteers. The magazine publishes research, scientific, and technical articles.

The Commentator is a magazine published four times each year by the students in the School of Arts and Sciences. The editor is elected by the Student Arts and Sciences Council.

The Southwestern Veterinarian is published quarterly by the students of the School of Veterinary Medicine. The

"Vet" is the leading college Veterinary magazine in this country and is circulated in every state of the nation as well as in many foreign countries.

The Memorial Student Center: The activities program of the Center is headed by the Memorial Student Center Directorate, which is made up of the chairman of the committees sponsored by the Memorial Student Center Council, governing body of the Center. These activities are as follows: Music Committee, Dance Committee, Browsing Library Committee, Crafts Committee, Art Gallery Committee, Bowling Committee, Games Committee (Bridge, Chess, Table Tennis, Canasta, and Checkers), House Committee, Camera Club, Public Relations Committees, Amateur Radio Club, Student Forum Committee, Junto (student-faculty discussion group). All of these activities are separate organizations, and all of these organizations make requests to and receive funds from the Memorial Student Center Council's monies for the activity program of the Center.

In addition to the above activities, the Center houses a large number of the meetings, receptions, exhibits, and dances of the approximate 200 clubs and activities of the campus.

Clubs: Many opportunities exist for the student who is interested in extracurricular club activity. There are more than 150 organizations ranging in interest from home town clubs to technical societies. The clubs formulate their organizations at the beginning of the school year and usually hold two meetings a month. Activities include discussion meetings, movies, smokers, barbecues, dances, and inspection trips.

Intramural Athletics: Intramural athletics feature contests between military units and between non-military organizations in seventeen different sports. Students are encouraged to match their athletic ability with fellow students to develop a competitive spirit, sound bodies, self control, and good sportsmanship. The intramural program, which is one of the most outstanding in the country, includes flag football, softball, volleyball, handball, basketball, track, swimming and diving, wrestling, bowling, horseshoes, rifle shooting, weight lifting, golf, cross country, tennis, and table tennis. Every vacant field is a practice place for these various sports. There are five football fields, four basketball courts, twenty-two tennis courts, seventeen softball fields, ten volleyball courts, eighteen horseshoe courts, an eighteen-hole golf course, and other miscellaneous facilities.

The Ross Volunteer Company: This unit was organized in 1887 by Colonel T. M. Scott, business manager of the College, for the purpose of banding together the most proficient military men in A. and M. into a crack drill team. They were first called the Scott Volunteers. The name was changed to Ross Volunteers in 1891 to honor Governor Lawrence Sullivan Ross, who in that year became President of the College. It was originally the plan of the organization to change its name in honor of each succeeding president of the College, but in 1902, at President Harrington's request, the idea was dropped and the name Ross Volunteers made permanent.

MUSICAL ORGANIZATIONS

The Texas Aggie Band: The Texas Aggie Band, under the direction of Lt. Colonel E. V. Adams, is the official band of A. and M. College and is of foremost importance on the campus. The Band is often referred to as the pulse of the Spirit of Aggieland and furnishes music for all military ceremonies, yell practices, and athletic events.

The Band is composed of a Freshman Band, which is housed and operated as a unit, and the Upper-classman Band made up of sophomore, junior, and senior students. New students should indicate on the advance room reservation card their desire to participate in band. This action will insure their names being placed on the Freshman Band roster.

Although a large number of College-owned and government-owned instruments are available for issue, it is advised that students owning their own instruments bring them.

The Singing Cadets: This widely known singing unit consists of more than sixty well trained voices under the direction of W. M. Turner. The group has appeared in more than one hundred Texas cities, on numerous broadcasts, and on other entertainment programs. Membership is selected from the entire student body after tryouts held early in the regular school year. Suitable awards are made to those who are selected for membership. One or two quartets are chosen from the group, and they often furnish entertainment for campus functions.

The Aggieland Orchestra: The Aggieland Orchestra is an outstanding collegiate band sponsored by Student Activities and directed by W. M. Turner. The orchestra plays for most of the college dances during the social season. It also plays for dances held by various campus organizations. Tryouts for membership are given when vacancies occur.

The Music Hall: For the student interested in music, the College has provided a building with practice rooms and practice pianos. The building is supervised by W. M. Turner, who acts as counselor for those who practice there. There is a library of piano, vocal, and other instrumental literature which can be checked out by the students. It is open for use from 8 a.m. until 5 p.m. but can be used by special permission at night for instrumental or vocal groups.

Memorial Student Center Music Committee: This committee consists of students interested in working with the music program for the Memorial Student Center. It recommends the policies for the use of the record playing room, selects the music for the music library, the nickelodeons, the public address system, and co-sponsors a bi-weekly classical record program over WTAW. Special musical events, such as the intercollegiate talent show, the Aggie talent show, and other musical shows are handled by this committee.

ENTERTAINMENT

Guion Hall Theater: The Guion Hall Theater is operated to provide economical and convenient movie entertainment for the student body and College staff. Good pictures are shown, though they are usually second run shows in order to keep costs as low as possible. Continuous filmings are shown while school is in session.

The Grove: The Grove is an outdoor concrete slab which is utilized by the Student Activities Department for movies, intramural athletics, concerts, dancing, skating, games, and festivals.

Memorial Student Center: The activities program of the Center includes dances, recreational facilities, banquets, Film Society, Concert Series, talent shows, record listening hours, and many types of special events. These activities are coordinated and planned by the Memorial Student Center Directorate and Memorial Student Council, with staff advisers from the Social and Educational Department of the Memorial Student Center.

Town Hall: The Town Hall program includes the best obtainable artists in the fields of music and entertainment. Since its inception, its popularity has grown each year. Activity fees, the sale of season tickets, and funds made available by the College make it possible to bring outstanding programs to the student body at low prices.

Dances: Social life at the College is highlighted by numerous dances. During the school year the freshman, sophomore, and junior classes sponsor dances. Military Balls are held by each regiment, and outstanding name bands play for many All College Dances. The most elaborate function is the annual Senior Ring Dance and Banquet, when graduating seniors and their guests dance to the outstanding orchestra of the year.

INTERCOLLEGIATE ATHLETICS

The A. and M. College of Texas is a member of the Southwest Athletic Conference, which embraces seven leading major colleges and universities—The University of Texas, the Agricultural and Mechanical College of Texas, Baylor University, the Rice Institute, Texas Christian University, Southern Methodist University, and the University of Arkansas. The intercollegiate program includes football, baseball, basketball, track, cross country, swimming, tennis, golf, pistol and rifle shooting, and fencing. Varsity teams in each sport are known as the Texas Aggies, and the uniforms used by the players are in the school's colors, maroon and white. The A. and M. College of Texas has won more than its share of conference championships, especially in football.

Center of athletics is Kyle Field, which contains the football stadium seating 33,000 in the old stands, 2,460 in the new addition to the west stands, and with temporary bleachers and cinder path boxes giving a total capacity of 41,594. A quarter-mile cinder track with a 220-yard straight-away and a baseball diamond with 4,000 seats afford excellent facilities for these sports. The P. L. Downs, Jr., Natatorium with swimming pool 100 by 60 feet, has lockers and showers, and seats for 600 spectators. DeWare Field House has been converted from a 3,500-seat basketball gymnasium into a Physical Education Plant, while a new Physical Education Building seating 8,500 is available for basketball and other indoor College events. In addition there is an auxiliary gymnasium with handball courts and large rooms for physical education classes. An 18-hole golf course is available to students on the campus. This 6,715-yard course is the third longest in the South.

EMPLOYMENT FOR UNDER-GRADUATE STUDENTS

All part-time employment of resident students is supervised by the Student Labor Office under the Dean of Men,

and every effort is made to develop such employment opportunities outside of the College as may be available. To become eligible for such employment, the student must have been admitted to the College by the Registrar and have an accepted application on file with the Student Labor Office. Continued eligibility for employment is contingent on satisfactory performance of work and on the ability of the student to maintain a good scholastic standing.

Ordinarily only those students whose financial resources are limited may be considered for employment. Work assignments are made primarily on the basis of need and sincerity of purpose. In so far as possible, work assignments are made to jobs allied with the student's major field of study, or to work that requires the least amount of study time. No student should expect to earn more than one third of his expenses. First-term students should not plan to do outside work, since most of their energies will be required to make proper adjustment to college life.

EMPLOYMENT FOR GRADUATES

The College feels a definite responsibility for the proper professional placement of its graduates. Assistance in fulfilling this responsibility is shared jointly by the faculty and the Central Placement Office. The function of this office is to maintain active contact with prospective employers of the graduating students and alumni in such a manner that well qualified men may be directed to suitable job opportunities.

Supplementing assistance in securing professional employment, this office cooperates with other college departments in an educational program designed to acquaint undergraduates with opportunities in the fields of work in which they are interested, and to advise on problems which will be met in entering professional employment. Assistance is given students in preparing credentials for submission to employers as well as advice on the proper approach in seeking a job. Assistance is also given undergraduates in securing employment during the summer vacation.

Seniors and graduate students who wish to make use of these services are requested to file a record of their qualifications with the Placement Office early in the year in which their college work will be completed. There is no charge for this service other than for personal leaflets, which are prepared at cost on request.

LOAN FUNDS

The Association of Former Students administers a series of loan funds, which are available to any student who has been in the College for at least three semesters and whose record in scholarship and in conduct is satisfactory. The amount of the loan depends in each case on the student's actual needs.

Other student loan funds are operated through the Office of Student Affairs in Room 106 of Goodwin Hall. They are the Lucy Jane Breazeale Loan Fund, sponsored by W. G. Breazeale as a memorial to his mother; the Ernestine Gaber Loan Fund, sponsored by Leo Gaber as a memorial to his mother; the Davis Buck Fund, sponsored by William K. Davis; and the Allsup-Ramsey Loan Fund, sponsored by Keith E. Allsup and Patrick H. Ramsey.

SCHOLARSHIPS, FELLOWSHIPS, AND AWARDS

The scholarship program is administered by a permanent committee known as the Faculty Committee on Scholarships. As authorized by the Board of Directors, this committee is composed of the Dean of the College, who serves as chairman; the Dean of Men; Secretary of the Former Students Association; and representatives, appointed by the President, as follows: one from the Basic Division and one from each of the undergraduate schools of the College.

In general there are three types of scholarships available: (1) Valedictory Scholarships and Opportunity Awards, representing those limited to entering freshmen; (2) scholarships designed for the more advanced undergraduate students, and (3) fellowships and grants-in-aid for graduate students.

The over-all program is designed to encourage and reward scholastic effort on the part of all students; to enable outstanding students to do the best work of which they are capable by removing financial handicaps; and to enable capable and ambitious young men who might be denied a college education for financial reasons only to secure that education at the Agricultural and Mechanical College of Texas.

Valedictory Scholarships

The College offers a scholarship to the valedictorian or honor graduate, if a boy, of an accredited secondary school of Texas that holds at least fifteen units accredited by the Texas Education Agency. The successful applicant must make the highest record among all students, boys and girls, graduating that calendar year including winter, spring, and summer graduating classes, and must be certified through the

Texas Education Agency. The scholarship is valid during the first long session after the holder's graduation from high school. The financial benefit is exemption from the matriculation fee of $25.00 for each of the two semesters, or a total of $50.00. The scholarship is not valid for the second semester unless the student has passed at least ten semester hours for the first semester with an average grade of C or better.

The Opportunity Award Program

This program annually provides 75 or more four-year scholarships to high school graduates of Texas who are capable of outstanding scholastic achievement and who need financial assistance to attend college. The awards are made possible by the A. and M. College Development Fund and by interested citizens and organizations of the State. Financial benefits range in value from $800 to $1600 with recipients receiving from $200 to $400 each year for four years, plus an opportunity for additional earnings from student employment if necessary. Most of the awards are unrestricted as to course of study or degree objective in college.

Graduates of accredited high schools of Texas who have not attended another college or university, who are legal residents of this state, and who need financial assistance to attend college are eligible to make application for an Opportunity Award Scholarship. To be considered for such a scholarship, an applicant must satisfy the admission requirements of the College; must make formal application for an award on forms provided by the College; and must enter the State-wide competition which is held each spring. Selections are made by the Faculty Committee on Scholarships on the basis of the applicant's academic record in high school; his scores on competitive examinations; evidence of initiative, leadership, and other traits of good character; and his need for financial assistance. In order for the award to be continued from semester to semester, the recipient must maintain a standard of scholastic achievement and personal conduct satisfactory to the Scholarships Committee.

This program is usually announced officially between February 20 and March 10 each year. Official announcements and application blanks are distributed over the State between these dates and are also made available to those interested upon request. Requests for additional information and application forms should be addressed to the Secretary, Faculty Committee on Scholarships, Office of the Registrar, A. and M. College of Texas, College Station, Texas.

Scholarships for Advanced Undergraduate Students

One-year scholarships ranging in value from $100 to $750 are available to outstanding students already enrolled in the College. Some of these are limited to certain fields of study and to individuals who have attained a necessary academic classification, while others are unrestricted in this regard. Recipients are usually chosen by the Faculty Committee on Scholarships in April or May each year with the basis of selection determined by the nature and intent of the award.

Some of these scholarships are given as "rewards for a job well done" and are intended to recognize outstanding scholastic achievement or other meritorious accomplishments. As such, they not only benefit financially the student concerned but also encourage and promote scholastic attainment and leadership on the part of other individuals. In addition to the reward type of scholarship, others are made available to outstanding students who must have financial assistance in order to remain in school or to do a high quality of work while enrolled. It is the general objective of this type of award to encourage every scholar to go as far as his abilities and ambition will carry him.

Information regarding scholarships for advanced undergraduate students may be obtained from the Secretary, Faculty Committee on Scholarships, Office of the Registrar.

CURRICULA

There is one two-year curriculum, pre-veterinary medicine. Its satisfactory completion is prerequisite to application for acceptance into the curriculum in veterinary medicine. There are 25 curricula extending through four years. Of these the curriculum in veterinary medicine leads to the degree of Doctor of Veterinary Medicine; the curriculum in liberal arts leads to the degree of Bachelor of Arts; the curriculum in business administration leads to the degree of Bachelor of Business Administration; the others lead to the degree of Bachelor of Science. The curriculum in architecture covers a period of five years and leads to the degree of Bachelor of Architecture. The five-year curriculum in petroleum engineering leads to the degree of Bachelor of Petroleum Engineering. Five-year combined courses are offered in chemical engineering—business administration and petroleum engineering—business administration leading to the degrees of Bachelor of Science in the appropriate field of engineering and to the degree of Bachelor of Business Administration.

Five-year combined courses are also offered in geology—petroleum engineering, petroleum engineering — chemical engineering, petroleum engineering—geological engineering, and petroleum engineering—mechanical engineering. Satisfactory completion of these programs leads to the degrees of Bachelor of Science in both fields of specialization. The five-year curriculum in industrial engineering differs from the other five-year curricula in that a degree of Bachelor of Science in Industrial Engineering may be awarded to a student who has satisfactorily completed one of the four-year curricula leading to the degree of Bachelor of Science in Aeronautical, Chemical, Civil, Electrical, Mechanical, or Petroleum Engineering and a fifth year of prescribed work as outlined on subsequent pages.

Combined Degree Plans

Students may also pursue a five-year program combining full professional training with a broad general education to qualify for two degrees—the Bachelor of Science degree in a technical or professional field and the Bachelor of Arts degree in one of the liberal arts curricula. For example, a student choosing this program may qualify in five years for the degree of Bachelor of Science in Mechanical Engineering and for the degree of Bachelor of Arts in English. Special care is needed in drafting the degree plan and in following it closely. The student contemplating such a program is advised, consequently, to consult the heads of both departments concerned in formulating a combined degree plan.

TWO-YEAR CURRICULUM

Pre-Veterinary Medicine

FOUR-YEAR CURRICULA

Aeronautical Engineering
Agriculture
Agricultural Administration
Agricultural Education
Agricultural Engineering
Agricultural Journalism
Animal Science
Business Administration
Chemical Engineering
Civil Engineering
Electrical Engineering
Food Technology
Geological Engineering
Geology
Industrial Education
Industrial Engineering
Landscape Architecture
Liberal Arts
Mechanical Engineering
Petroleum Engineering
Plant and Soil Science
Range and Forestry
Science
Veterinary Medicine
Wildlife Management

FIVE-YEAR CURRICULA

Architecture
Chemical Engineering—
Business Administration
Geology—Petroleum
Engineering
Industrial Engineering
Petroleum Engineering
Petroleum Engineering—
Business Administration
Petroleum Engineering—
Chemical Engineering
Petroleum Engineering—
Geological Engineering
Petroleum Engineering—
Mechanical Engineering

THE BASIC DIVISION

The Basic Division is a non-degree granting school which was established to aid entering students in their adjustment to college. The Dean of the Basic Division administers the work of all entering students until they are admitted into one of the degree granting schools.

SPECIFIC AIMS

The aims of the Basic Division may be summarized as follows:

1. To give the first year college student sufficient supervision to aid him in the transition from high school to college study and to help him adjust to college life.

2. To afford every student assigned to the Basic Division the benefits of a planned program of educational and vocational guidance so that he may make an intelligent choice of a course of study and related school activities.

3. To furnish the student who has not decided upon a course of study an opportunity to gain some insight into the educational requirements of the various curricula.

4. To furnish the necessary aid to the student who is in need of assistance in the development of general study skills or in specific subject areas.

5. To supply the various schools of the College with a selected group of students qualified to pursue the training necessary for professional competency and mature citizenship.

GUIDANCE FUNCTIONS

The student enrolled in the Basic Division is offered many opportunities for both individual and group guidance. Opportunity for individual guidance and counseling by professionally trained personnel is provided throughout the school year. Members of the Basic Division Staff administer a battery of aptitude and achievement tests before the beginning of the school year. The results of these tests are employed for placement purposes with the objective of more fully assisting each new student to adjust to the academic requirements of the College. These tests are often supplemented by other psychological measures and are also utilized for other counseling purposes.

NEW STUDENT WEEK

The Basic Division coordinates and administers the annual New Student Week program. This program is held during

the week prior to the beginning of the fall semester. Each new student admitted to the Basic Division is required to participate in this program. Early in the week a series of tests is given, the results of which are used for counseling and guidance purposes. Any student whose high school entrance units and grades, or whose scores on these tests indicate that he may have difficulty in pursuing the course he has chosen, may be advised to register in special sections designed to fit his particular needs. The main objectives of New Student Week are to provide the beginning student the opportunity for group and individual consultation with counselors, to give him the opportunity to get acquainted with various school officials, and to acquaint him with College rules and regulations.

TESTING SERVICE

Should a student desire to learn more about himself than the basic group of tests reveals, the Basic Division has available many additional aptitude, personality, and interest tests which he may take. Usually the student and his counselor decide which of the many tests available would be suitable and advisable.

GROUP GUIDANCE

Each new student may enroll in special group guidance courses during his first year at the Agricultural and Mechanical College of Texas. The group guidance program should assist the beginning college student to anticipate and to master problems which are common to most beginning freshmen. Description of each of these courses is given in this catalogue. Basic 101, 102, 103, 104, and 105 are recommended for students who want special assistance or who are undecided about the course of study to pursue. Basic 106 and 107 are recommended for students who have their vocational goals more clearly in mind. Two of the "Basic" courses may apply toward meeting the freshman or sophomore elective requirement in all curricula. A "Basic" course chosen as an elective normally will be taken in the second semester of the freshman year, although a student with unusual aptitude or need may be permitted to enroll in one of them during his first semester. The General Curriculum outlined on page 94 of this catalogue includes Basic 105 for vocational guidance reasons, since students following this curriculum are those who are not yet ready to designate their course of study.

BASIC DIVISION ASSEMBLY

During his first semester, one hour each week will be set aside in the student's schedule for the purpose of a special assembly to be supervised by the Dean of the Basic Division. Attendance at this assembly is required of all first semester Basic Division students.

REMEDIAL AID

Many opportunities for assistance are available to the student enrolled in the Basic Division. A Remedial Reading Laboratory and a Study Habits Program have been established to assist students needing special help in these areas. In addition, special assistance in specific subject matter areas has been provided with the cooperation of the various academic departments of the degree granting schools.

CURRICULA FOR FRESHMAN STUDY

In general the Basic Division provides two types of curricula from which the entering student may select the one which best fits his own particular needs. These may be summarized as follows:

1. **General Curriculum.** This curriculum is for the student who is not ready to designate his degree objective. It is designed to furnish the entering student experience which will assist him in evaluating and deciding upon his degree objective. Since requirements for graduation necessarily differ in the various curricula, not all changes from the General Curriculum to a degree curriculum can be made without the need for earning extra credit, especially when the curriculum finally chosen permits few electives. A student who decides upon his degree objective by the beginning of the second semester may take courses required in his degree curriculum. If a student has not decided upon his degree objective by this time, he is advised to continue with the General Curriculum for the second semester.

GENERAL CURRICULUM

First Semester		Credit
Basic 105	(0-2)	1
The World of Work		
Chemistry 101[1]	(3-3)	4
General Chemistry		
English 103	(3-0)	3
Composition and Rhetoric		
Geography 201[2]	(3-0)	3
Principles of Geography		
Mathematics 101 or 102[3]	(3-0)	3
Algebra		
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		15

Second Semester		Credit
Basic 106	(0-2)	1
Survey of Man's Knowledge		
Chemistry 102[1]	(3-3)	4
General Chemistry		
English 104	(3-0)	3
Composition and Rhetoric		
Mathematics 103	(3-0)	3
Plane Trigonometry		
Military or Air Science	(0-3)	1
Elective[4]		6
Physical Education 102	(0-2)	R
		18

Notes: 1. Students who desire to do so may take Biology 101, 107 instead of Chemistry 101, 102 in their first and second semesters. Chemistry, however, is required or is acceptable in more degree curricula than is biology.

2. On approval of the Dean of the Basic Division, a student may substitute an elective for Geography 201.

3. See requirements in mathematics for all students as stated in the paragraph below entitled "Individualized Curricula."

4. Electives will be chosen by the student and approved by the Dean of the Basic Division prior to registration for the second semester.

2. **Degree Curriculum.** This curriculum is designed for the student who has decided to major in one of the courses of study provided by one of the degree granting schools of the College. The specific courses required in this curriculum may be determined by consulting the index of this catalogue for the page number where the desired curriculum is listed. All curricula include from one to three hours of elective credit in the second semester of the freshman year. A student need not take an elective course that carries the exact hours of credit prescribed in his curriculum. The elective listed in the freshman year may be combined with other elective hours listed later in his curriculum provided the student desires to do so. With the approval of the Dean of the Basic Division, a student may register for any of the courses listed as "Basic" courses in the course description section of this catalogue, or for any other elective courses for which he may have prerequisites. Two of the "Basic" courses may apply toward meeting the freshman or sophomore elective requirement in all curricula. Electives normally will be taken in the second semester of the freshman year although a student with unusual aptitude or need may be permitted to enroll for one of these electives during his first semester. **A student whose high school record and entrance tests indicate inadequate preparation may be required to register for either a reduced load or special courses designed to meet his need.**

INDIVIDUALIZED CURRICULA

A student who is deficient in English may take English 100, Fundamentals of Writing, as a means of achieving greater proficiency in this area before progressing with English 103. A student who is deficient in arithmetic skills may take Mathematics 100, General Mathematics, before enrolling in Mathematics 101. Hours of credit toward a degree will not be granted for the satisfactory completion of either English 100 or Mathematics 100. These courses may be taken either in a regular semester or during the summer at the Junction Adjunct. A student whose high school record and entrance tests indicate adequate preparation for Mathematics 102, Algebra, may enroll for it regardless of the mathematics requirement of his degree objective. The completion of this course will permit the student to transfer into any curriculum of the College without taking an additional course in algebra. Mathematics 102 will substitute automatically for Mathematics 101 when the latter is required in the curriculum. Similarly, a student whose record indicates superior preparation in such fields as chemistry and English may register for such advanced courses in these departments as are approved after personal consultation with the Dean of the Basic Division.

CURRICULUM FOR SECOND YEAR IN BASIC DIVISION

A student who is permitted to remain in the Basic Division a second year will first schedule courses to make up any deficiencies in his first year's work. He will complete his schedule with courses required in the curriculum of his degree objective.

REQUIREMENTS FOR TRANSFER TO A DEGREE GRANTING SCHOOL

The requirements for transfer from the Basic Division to one of the degree granting schools of the College are stated on page 61 of this catalogue.

JUNCTION ADJUNCT

Many of the counseling and guidance functions of the Basic Division are carried on during the summer at the Junction Adjunct. During a six-weeks term there a student is able to discover more fully his aptitudes and interests and is helped in relating these to the demands and opportunities of various college curricula. Results of aptitude, achievement,

interest, and personality tests are used to help the student know much more about himself than is otherwise possible. By knowing himself better, a student is able more intelligently to decide upon his course of study in college. Further, he is able to know the areas of his strength and his weakness, thus being able to capitalize upon the one and improve upon the other. Among the students who are especially urged to attend the Junction Adjunct are those whose high school average grade is under 80, and those who have not fully decided upon a course of study in college.

A student who is found to be prepared for regular college courses may enroll in the first course of college English and the first course in college mathematics in addition to a Basic Division course and the first course in physical education. A student who is found not to be prepared fully to progress with regular college courses is offered special help in the area of his weakness. Thus, a student having a weakness in mathematics may take a preparatory course in general mathematics (Mathematics 100); one having a weakness in English may take a preparatory course in English (English 100); and a student having a weakness in reading may participate in a program of remedial reading.

THE SCHOOL OF AGRICULTURE

CURRICULA

FOUR-YEAR CURRICULA

Agriculture
Agricultural Administration
Agricultural Education
Agricultural Engineering
Agricultural Journalism
Animal Science
Food Technology
Landscape Architecture
Plant and Soil Science
Range and Forestry
Wildlife Management

AGRICULTURE

The curriculum in agriculture has as its main objectives the preparation of young men for the business of farming and ranching including floriculture and ornamental horticulture; for the pursuit of scientific investigation in the field of agriculture; for work with the various governmental and private agricultural agencies; for farm managers; and for teaching in high schools and agricultural colleges. It also affords excellent preparation for young men who intend to enter the field of processing and marketing food and fibre products, including dairy products, fruits and vegetables, flowers and ornamentals, meats and poultry, and wool and cotton. Systematic training is given in the sciences of biology, chemistry, and entomology, which are fundamental to the study of scientific agriculture, and in technical subjects covering the main divisions of agriculture, including agronomy, animal husbandry, dairy husbandry, dairy manufacturing, entomology, floriculture, horticulture, and poultry husbandry. As shown in the curriculum, the work in the junior and senior years is arranged so as to provide for a choice by the student of one of nine groups of studies. This arrangement affords the student a wide range of subjects from which to choose his major work.

AGRICULTURAL ADMINISTRATION

The curriculum in agricultural administration is designed to prepare students for professional work as agricultural economists, for commercial work with agricultural industries, for the operation of farms and ranches, and for rural social service work.

The first two years are planned to give students the fundamental studies. In the sophomore year students may choose either Group 1 (agricultural economics), Group 2 (farm management), Group 3 (rural sociology), or Group 4

(pre-seminary training of rural ministers and agricultural missionaries).

The program in agricultural economics affords opportunity for students to prepare themselves for professional work with governmental agencies and private concerns in such capacities as research analysts, teachers, and field representatives. By electing courses in business administration, students may also qualify for various types of work in the commerce of agriculture. Adequate electives are available to enable students to select a number of courses dealing with one farm product with view to becoming specialists in the marketing of that commodity.

The program in farm management is intended to prepare students for the operation of farms and ranches. It includes fundamental subjects in all the fields of agriculture, yet provides enough electives to permit students to emphasize the study of the particular agricultural enterprises in which they are most interested.

The program in rural sociology affords professional training in the field of social work with special emphasis on rural social problems and organizations. Graduates are qualified for service with various public and private rural social agencies.

The program for pre-seminary training of rural ministers and agricultural missionaries is designed to give students interested in such work the necessary general education to enter theological seminary and a knowledge of technical agriculture that will enable them better to understand farm people and their problems.

AGRICULTURAL EDUCATION

This curriculum, which includes a minimum of 60 semester hours of credit in technical agriculture, is designed to give the teacher of vocational agriculture the preparation and training in both technical agriculture and education, including student teaching, required to qualify under the Texas plan for vocational education.

Graduates of approved institutions having satisfactory training in the sciences underlying the study of agriculture will be awarded the degree of Bachelor of Science in Agricultural Education upon satisfying the following requirements: (1) the curriculum for majors in agricultural education and (2) approximately the last two year's work in residence.

AGRICULTURAL ENGINEERING

The curriculum in agricultural engineering is under the joint supervision of the School of Agriculture and the School of Engineering. Agricultural engineering deals with the application of the fundamental branches of engineering to the peculiar conditions and requirements of agriculture as an industry and as a field of applied science. The term "agricultural engineer" denotes an engineer who has been trained in both engineering and agriculture, with experience in combining the two, and who is qualified to develop, design, organize, and direct engineering work in the agricultural and closely allied industries. It is the work of the agricultural engineer to strive for maximum efficiency and economy in agricultural operations and equipment just as engineers in other branches of the profession seek to promote progress in their respective industries.

In general, agricultural engineering may be broken down into four major phases of activity—farm power and machinery, farm buildings and structures, farm electrification, and soil and water control and conservation which includes drainage, flood control, irrigation, land clearing, soil erosion control, and related problems.

The need for men with this training is being felt more and more as the demand grows for farms better equipped with power machinery, farm buildings and home utilities, and for land reclamation by soil erosion control, drainage, and irrigation.

Graduates of this curriculum are prepared for service with the colleges and the government in teaching, extension, and research work; with government soil erosion control projects; with manufacturers of farm machinery, tractors, and other farm equipment; in advertising, sales, and design work; with engineering and contracting firms doing soil erosion control, irrigation, and drainage work; and as rural electrification specialists.

AGRICULTURAL EXTENSION

Agricultural extension work requires a broad training in agriculture together with some training in public relations and extension methods. Students planning to enter this work should choose their program from one of the majors in general agriculture, agricultural education, or farm management and include courses in psychology and extension methods in their

degree plan. Candidates for appointment in the Texas Agricultural Extension Service are required to have credit for work in methods and psychology or to take such work during the training period of their employment.

AGRICULTURAL JOURNALISM

The curriculum in agricultural journalism is designed to prepare students for professional careers as agricultural writers and editors, including work on bulletins and magazines as well as on rural and metropolitan newspapers, and in radio broadcasting.

The first two years are planned to give students the fundamental studies. The program affords opportunities for students to prepare themselves as specialists in certain phases of agricultural writing but with an adequate background for general journalistic work.

This curriculum is administered by the Department of Journalism in the School of Arts and Sciences.

ANIMAL SCIENCE

The demand for qualified leaders in the various fields of science and especially in the agricultural sciences is far in excess of the supply. The need is particularly acute for college teachers, extension leaders, research workers in state and federal (USDA) agricultural agencies, and in industrial laboratories. There is also a demand for qualified agricultural leaders or advisors in foreign countries. To meet this demand the animal science curriculum was developed. This curriculum is designed to give more adequate training in the basic sciences. Those who complete this course of study will be qualified for graduate work in the fields of nutrition, animal breeding, genetics, physiology of reproduction, zoology, bio-statistics or related fields, and at the same time may qualify as majors in one of the regular animal curricula in the School of Agriculture. This curriculum may be considered, therefore, as either terminal or as preparation for graduate study.

In order to obtain a major in one of the regular courses in agriculture, the student should select electives in relation to that major.

CONSERVATION

Considerable interest has developed during the past several years in the conservation of soils, water, wildlife,

and other natural resources. There is no separate Department of Conservation. Students may elect courses, however, which are designed to provide a general knowledge of conservation, or they may plan a course of study in one of the subject matter departments which prepares them for professional work with one of the agencies concerned with conservation.

Four options are open to students who desire professional work with the Soil Conservation or the Department of the Interior. For appointment as Junior Engineer, a degree in agricultural engineering is required. Students who complete the requirements for a major in agronomy are eligible for appointment as Soil Conservationists or Soil Scientists. Majors in range and forestry are prepared for appointments as Range Conservationists. Preparation for work as Wildlife Management Specialist is given in the Department of Wildlife Management.

For a list of courses dealing with various phases of conservation, see "Conservation" in the course description section of this catalogue.

FOOD TECHNOLOGY

The curriculum in food technology is designed to train students in the technical and scientific problems of food processing and manufacture. The work includes a broad foundation in the chemistry and bacteriology of food products and in the mechanics of food plant operation; and the packaging, storage, and distribution of foods.

This course of study includes a considerable number of elective hours, enabling the student to take a block of electives in the sources, production, processing, inspection, and grading of dairy products; fruit and vegetable products; meat and poultry products; and miscellaneous foods and beverages.

Graduates in this field should find employment in dairy plants, creameries, dehydrating and freezing plants, food locker plants, and meat products packing plants as well as a variety of miscellaneous food and beverage plants. There is also a need for men trained in this field in the federal and state inspection work and marketing services. Some men will find opportunities in food products research with state and commercial agencies.

There is no separate Department of Food Technology. The subjects included in this curriculum are offered by several departments in the College, but the curriculum and students majoring in it are under the supervision of a

Committee on Food Technology appointed from the agricultural teaching staff by the Dean of Agriculture. Dr. A. V. Moore of the Department of Dairy Husbandry serves as Chairman of the Committee.

LANDSCAPE ARCHITECTURE

The curriculum in landscape architecture is arranged to help students attain proficiency in the arrangement of ground and water forms for the purpose of securing the greatest returns in human use and enjoyment. The projects developed by landscape architects include private gardens, farmsteads, country estates, public building sites, industrial areas, golf courses, cemeteries, and arboretums. Designing of public recreation areas such as public gardens, playgrounds, and parks of all types is also included in the field of landscape architecture.

A successful landscape architect must possess or develop an artistic sense, engineering ability, and the fundamentals of architecture in addition to a knowledge of the basic elements of land, water, vegetation, and the forces of nature. He must possess the ability to present his ideas for design and construction by means of drawings in plan and perspective, as well as by means of written or spoken words.

Graduates are engaged in private practice; in the employ of city, state, and regional planning boards; as managers of city park systems, university campuses, large private estates, memorial park cemeteries, arboretums; in various phases of work with the National Park Service; as teachers, and as landscape architects with many of the larger nurseries.

PLANT AND SOIL SCIENCE

Advancements in the field of agriculture are creating a demand for highly trained and specialized personnel. More and more students in agriculture are becoming interested in preparing themselves for graduate study or specialized work. The curriculum in plant and soil science is designed to give more adequate preparation in the basic sciences for those students interested in studies leading to advanced degrees or in preparation for technical work as plant breeders, plant pathologists, plant physiologists, soil scientists, etcetera. This curriculum provides a foundation for extension, research, or teaching in government branches or in industries.

There is no separate Department of Plant and Soil Science. Students interested in soils or in field crops should

group their electives in the Department of Agronomy; those selecting floriculture, in the Department of Floriculture and Landscape Architecture; and students selecting botany, horticulture, plant physiology and pathology, or range management, in those departments offering specialized work in those subject areas.

RANGE AND FORESTRY

Range management is one of the important professions associated with agriculture, and for those students who wish preparation for service in this major, the Department of Range and Forestry offers a curriculum which emphasizes the following: (1) The importance of the plant sciences through plant and range ecology, (2) the production of livestock on native range and forest areas, (3) the fundamentals of plant and soil conservation on native range lands, and (4) principles and practices of forestry that are associated with range management and management of farm woodlots and other timber areas.

The plant sciences, animal husbandry, and agronomy are emphasized to give the student basic information for practical application. The basic educational fields of mathematics, chemistry, and English contribute to the firm foundation students in this field of study must acquire. The curriculum is unusually broad in scope to train one for the great variety of problems met in the multiple use and conservation of uncultivated lands.

Upon completion of range management training graduates are prepared to enter the ranch business either as owners or as managers. There are some openings in commercial enterprises for men trained in this field. Graduates often qualify for work as county agricultural agents, with the Experiment Station, or with other state organizations. Men meeting Civil Service requirements are eligible for appointments with the United States Soil Conservation Service, the United States Forest Service, the Bureau of Land Management, the Indian Service, the National Park Service, and other federal agencies. Graduates in this field are needed as teachers and instructors in educational institutions of Texas and elsewhere.

WILDLIFE MANAGEMENT

This curriculum includes work in fisheries and wildlife. At the beginning of the sophomore year, the student should elect one of the two options, fisheries or wildlife, because of

differences in the basic sciences required. The junior and senior years are largely years of specialization.

This curriculum is designed (1) to train young men in the art of managing wildlife on the land and maintaining populations at levels consistent with good land use practices and the desirability of the wildlife species involved and (2) to train men for research in taxonomy, distribution, and ecology of fishes, reptiles and amphibians, birds, and mammals. Also opportunities are provided, in cooperation with the Department of Journalism, for training in the field of wildlife journalism, and, in cooperation with the Department of Education and Psychology, for preparation in the field of conservation education.

Upon completion of the wildlife management curriculum, graduates are prepared to enter occupations in the fisheries or wildlife fields, including management, research, and teaching. Men meeting Civil Service requirements are eligible for appointments with the United States Fish and Wildlife Service, the United States Soil Conservation Service, and other federal agencies. Also, graduates are eligible for employment by the various state game and fish commissions. A few positions open from time to time as wildlife managers on private ranches.

The curriculum emphasizes the sciences of zoology, botany, and chemistry but also gives a firm foundation in mathematics, English, and other liberal arts and agricultural courses.

Curricula in AGRICULTURE

(For Majors in Agronomy, Animal Husbandry, Dairy Production, Dairy Manufacturing, Entomology, Horticulture, Poultry Husbandry)

FRESHMAN YEAR

First Semester		Credit
Agronomy 105 Fundamentals of Crop Production	(2-2)	3
Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Animal Husbandry 107 General Animal Husbandry	(2-3)	3
Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Military or Air Science	(0-3)	1
Poultry Husbandry 201 Poultry Production	(2-2)	3
Elective		1
Physical Education 102	(0-2)	R
		18

NOTES:

1. Electives shall be selected and substitutions made with the advice of the head of the student's major department.
2. At least 16 but not more than 24 credit hours of advanced courses in the student's major department shall be permitted toward requirements for graduation.
3. Students who expect to enter the Agricultural Extension Service will be required to have credit for Agricultural Education 441 and Psychology 301. Such students should include these courses in their upper class electives.
4. Students who expect to major in entomology should take Biology 108 as their sophomore elective.
5. Students who expect to major in animal husbandry should select either Animal Husbandry 202 or 307 as their sophomore elective.
6. Superior students who plan to continue in graduate study should consult their dean about transfer to the curriculum in animal science or plant and soil science.

SOPHOMORE YEAR

Chemistry 231 Elementary Organic Chemistry	(3-0)	3
Dairy Husbandry 202 Dairying	(2-2)	3
Economics 205 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Entomology 201 General Entomology	(2-2)	3
Military or Air Science	(0-3)	1
Physics 213 Physics for Students of Agriculture	(2-2)	3
Physical Education 201	(0-2)	R
		18

Agricultural Engineering 201 Farm Power and Machinery	(2-2)	3
Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 223 Elementary Quantitative Analysis	(2-3)	3
English 210 Writing and Discussion	(2-0)	2
Horticulture 201 General Horticulture	(2-2)	3
Military or Air Science	(0-3)	1
Elective		3
Physical Education 202	(0-2)	R
		18

SOPHOMORE ELECTIVES

Agricultural Economics 105 Introduction to Rural Economy	(3-0)	3
Agricultural Engineering 221 Farm Shop	(1-3)	2
Agricultural Engineering 325 Farm Electricity	(2-2)	3
Animal Husbandry 202 The Breeds of Farm Animals	(2-2)	3
Animal Husbandry 307 Meats	(2-3)	3
Biology 108 Invertebrate Zoology	(2-3)	3
Business Administration 209 Principles of Accounting	(2-3)	3
Floriculture 120 Ornamental Plant Production	(2-2)	3
Geology 309 Agricultural Geology	(3-3)	4
Mathematics 103 Plane Trigonometry	(3-0)	3
Range and Forestry 202 Range Plants	(2-3)	3
Range and Forestry 307 Elementary Forestry	(2-3)	3
Wildlife Management 201 Wildlife Conservation and Management	(3-0)	3

For a Major in AGRONOMY (Group 4)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

First Semester		Credit
Administration 311 Use of Library Resources	(0-2)	1
Agronomy 301 Introductory Soils	(3-2)	4
Genetics 301 Genetics	(3-2)	4
History 306 American National Government	(3-0)	3
Plant Physiology and Pathology 313 Introduction to Plant Physiology	(2-3)	3
Elective		3
		18

Second Semester		Credit
Agricultural Economics 314 Marketing Farm Products	(3-0)	
Or		
Agricultural Economics 421 Principles of Farm and Ranch Management	(2-2)	3
Agricultural Engineering 305 Terracing and Drainage	(3-3)	4
Animal Husbandry 303 Animal Nutrition	(3-0)	3
Elective		8
		18

SENIOR YEAR

English 301 Writing for Professional Men	(3-0)	
Or		
Journalism 415 Agricultural Journalism	(2-2)	3
***History 325** Trends in American History	(3-0)	3
Plant Physiology and Pathology 301 Plant Pathology	(2-3)	3
Elective		9
		18

English 403 Speaking for Professional Men	(1-2)	2
Rural Sociology 407 Rural Life Problems	(3-0)	3
Elective		13
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

For a Major in ANIMAL HUSBANDRY (Group 5a) Production Option

(For students primarily interested in livestock production and related problems)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

First Semester		Credit
Agronomy 308	(2-2)	
Forage Crops		
Or		
Range and Forestry 401	(2-3)	3
Range Improvement and Maintenance		
Animal Husbandry 303	(3-0)	3
Animal Nutrition		
Genetics 301	(3-2)	4
Genetics		
Veterinary Physiology and Pharmacology 329	(2-2)	3
Physiology of Farm Animals		
Elective		5
		18

Second Semester		Credit
Agricultural Economics 314	(3-0)	3
Marketing Farm Products		
Agronomy 301	(3-2)	4
Introductory Soils		
Animal Husbandry 409	(2-2)	3
Feeds and Feeding		
English 403	(1-2)	2
Speaking for Professional Men		
Genetics 306	(2-2)	3
Animal Breeding		
Elective		3
		18

SENIOR YEAR

Agronomy 417	(2-2)	
Pasture Management		
Or		
Range and Forestry 412	(2-3)	3
Range Management Practices		
Animal Husbandry 437	(2-2)	3
Marketing and Grading of Livestock and Meats		
English 301	(3-0)	
Writing for Professional Men		
Or		
Journalism 415	(2-2)	3
Agricultural Journalism		
*History 325	(3-0)	3
Trends in American History		
Veterinary Bacteriology and Hygiene 491	(2-2)	3
Animal Hygiene		
Elective		3
		18

Agricultural Engineering 333	(2-3)	3
Surveying and Water Utilization		
Animal Husbandry 427	(1-0)	1
Seminar		
History 306	(3-0)	3
American National Government		
Rural Sociology 407	(3-0)	3
Rural Life Problems		
Elective		8
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

(Group 5b)
Commercial Option

(For students primarily interested in the meat, feed, or other related livestock industries)

FRESHMAN YEAR

(See page 105)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 209	(2-3)	3
Principles of Accounting		
Chemistry 231	(3-0)	3
Elementary Organic Chemistry		
Dairy Husbandry 202	(2-2)	3
Dairying		
English 203	(2-0)	2
Composition and Literature		
Entomology 201	(2-2)	3
General Entomology		
Military or Air Science	(0-3)	1
Physics 213	(2-2)	3
Physics for Students of Agriculture		
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Agricultural Engineering 213	(2-3)	3
Food Plant Engineering		
Biology 206	(2-4)	3
Introductory Bacteriology		
Business Administration 210	(2-3)	3
Principles of Accounting		
Chemistry 223	(2-3)	3
Elementary Quantitative Analysis		
English 210	(2-0)	2
Writing and Discussion		
Military or Air Science	(0-3)	1
Elective		3
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Animal Husbandry 303	(3-0)	
Animal Nutrition		
Or		
Biochemistry and Nutrition 401	(3-0)	3
Human Nutrition		
Economics 403	(3-0)	3
Principles of Economics		
English 301	(3-0)	
Writing for Professional Men		
Or		
Journalism 415	(2-2)	3
Agricultural Journalism		
Veterinary Physiology and Pharmacology 329	(2-2)	3
Physiology of Farm Animals		
Elective		6
		18

Agricultural Economics 314	(3-0)	3
Marketing Farm Products		
Agronomy 301	(3-2)	4
Introductory Soils		
English 403	(1-2)	2
Speaking for Professional Men		
Genetics 301	(3-2)	4
Genetics		
Elective		5
		18

SENIOR YEAR

Animal Husbandry 437	(2-2)	3
Marketing and Grading of Livestock and Meats		
Business Administration 435	(3-0)	3
Salesmanship		
*History 325	(3-0)	3
Trends in American History		
Veterinary Bacteriology and Hygiene 491	(2-2)	3
Animal Hygiene		
Elective		6
		18

Animal Husbandry 427	(1-0)	1
Seminar		
Business Administration 422	(3-0)	3
Personnel Problems of Industry		
History 306	(3-0)	3
American National Government		
Psychology 303	(3-0)	3
Psychology for Technical Students		
Elective		8
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

For a Major in DAIRY PRODUCTION (Group 7a)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

First Semester		Credit
Dairy Husbandry 301	(3-2)	4
Market Milk		
Dairy Husbandry 303	(0-3)	1
Dairy Cattle Judging		
Dairy Husbandry 320	(3-3)	4
Bacteriology of Dairy Products		
Genetics 301	(3-2)	4
Genetics		
Veterinary Physiology and Pharmacology 329	(2-2)	3
Physiology of Farm Animals		
Elective		2
		18

Second Semester		Credit
Agronomy 301	(3-2)	4
Introductory Soils		
Animal Husbandry 303	(3-0)	3
Animal Nutrition		
English 403	(1-2)	2
Speaking for Professional Men		
Genetics 306	(2-2)	3
Animal Breeding		
History 306	(3-0)	3
American National Government		
Elective		3
		18

SENIOR YEAR

Agricultural Economics 314	(3-0)	3
Marketing Farm Products		
Agricultural Engineering 333	(2-3)	3
Surveying and Water Utilization		
Dairy Husbandry 417	(2-2)	3
History and Development of Dairy Cattle		
*History 325	(3-0)	3
Trends in American History		
Veterinary Bacteriology and Hygiene 491	(2-2)	3
Animal Hygiene		
Elective		3
		18

Dairy Husbandry 324	(3-0)	3
Commercial Dairy Products		
Dairy Husbandry 418	(3-2)	4
Feeding and Management of Dairy Cattle		
Dairy Husbandry 421	(1-0)	1
Seminar		
English 301	(3-0)	
Writing for Professional Men		
Or		
Journalism 415	(2-2)	3
Agricultural Journalism		
Rural Sociology 407	(3-0)	3
Rural Life Problems		
Elective		4
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

For a Major in DAIRY MANUFACTURING (Group 7b)

FRESHMAN YEAR

(See page 105 with the addition of the following note: Students who expect to major in dairy manufacturing may substitute Mathematics 103 or 110 for Poultry Husbandry 201 or Entomology 201.)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 209 Principles of Accounting	(2-3)	3
Chemistry 223 Elementary Quantitative Analysis	(2-3)	3
Dairy Husbandry 202 Dairying	(2-2)	3
English 203 Composition and Literature	(2-0)	2
Entomology 201 General Entomology	(2-2)	3
Military or Air Science	(0-3)	1
Physics 213 Physics for Students of Agriculture	(2-2)	3
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Business Administration 210 Principles of Accounting	(2-3)	3
Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 231 Elementary Organic Chemistry	(3-0)	3
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
History 306 American National Government	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Agricultural Economics 314 Marketing Farm Products	(3-0)	3
Business Administration 430 Cost Accounting Survey	(3-0)	3
Dairy Husbandry 301 Market Milk	(3-2)	4
Dairy Husbandry 320 Bacteriology of Dairy Products	(3-3)	4
Elective		4
		18

Agricultural Engineering 213 Food Plant Engineering	(2-3)	3
Dairy Husbandry 311 Technical Control of Dairy Products	(2-6)	4
Dairy Husbandry 316 Butter and Cheese Manufacture	(3-4)	4
English 403 Speaking for Professional Men	(1-2)	2
Elective		5
		18

SENIOR YEAR

Biochemistry and Nutrition 401 Human Nutrition	(3-0)	3
Business Administration 305 Business Law	(3-0)	
Or		
Business Administration 309 Food and Drug Law	(3-0)	3
Dairy Husbandry 407 Ice Cream Making	(2-3)	3
Dairy Husbandry 415 Condensed Milk	(1-2)	2
*History 325 Trends in American History	(3-0)	3
Psychology 303 Psychology for Technical Students	(3-0)	3
Elective		1
		18

Business Administration 422 Personnel Problems of Industry	(3-0)	3
Dairy Husbandry 410 Dairy Plant Management	(1-2)	2
Dairy Husbandry 418 Feeding and Management of Dairy Cattle	(3-2)	4
Dairy Husbandry 421 Seminar	(1-0)	1
English 301 Writing for Professional Men	(3-0)	
Or		
Journalism 415 Agricultural Journalism	(2-2)	3
Elective		5
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

For a Major in ENTOMOLOGY (Group 8)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

First Semester	Credit	Second Semester	Credit
Agronomy 301 (3-2) Introductory Soils	4	Entomology 302 (2-3) Systematic Entomology	3
English 403 (1-2) Speaking for Professional Men	2	Entomology 306 (2-3) Insect Physiology	3
Entomology 301 (2-3) Systematic Entomology	3	Genetics 301 (3-2) Genetics	4
Entomology 305 (2-3) Insect Morphology	3	Horticulture 319 (2-2) Orchard Management	3
History 306 (3-0) American National Government	3	Elective	5
Elective	3		18
	18		

SENIOR YEAR

Entomology 401 (2-3) Principles of Insect Control	3	English 301 (3-0) Writing for Professional Men	3
Entomology 423 (2-3) Comparative Anatomy of Arthropods	3	Entomology 402 (2-3) Agricultural Pests	3
*History 325 (3-0) Trends in American History	3	Entomology 424 (2-3) Insect Ecology	3
Plant Physiology and Pathology 301 (2-3) Plant Pathology	3	Rural Sociology 407 (3-0) Rural Life Problems	3
Elective	6	Elective	6
	18		18

For a Major in HORTICULTURE (Group 9)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

Agricultural Economics 314 (3-0) Marketing Farm Products	3	English 403 (1-2) Speaking for Professional Men	2
Agronomy 301 (3-2) Introductory Soils	4	Genetics 301 (3-2) Genetics	4
Horticulture 311 (2-3) Processing Horticultural Crops	3	Horticulture 319 (2-2) Orchard Management	3
Plant Physiology and Pathology 301 (2-3) Plant Pathology	3	Horticulture 322 (2-3) Vegetable Crops Management	3
Plant Physiology and Pathology 313 (2-3) Introduction to Plant Physiology	3	Elective	6
Elective	2		18
	18		

*Students completing 12 hours of advanced ROTC may substitute 6 hours of ROTC for History 325.

SENIOR YEAR

First Semester		Credit
Agricultural Engineering 305	(3-3)	4
Terracing and Drainage		
English 301	(3-0)	
Writing for Professional Men		
Or		
Journalism 415	(2-2)	3
Agricultural Journalism		
*History 325	(3-0)	3
Trends in American History		
Horticulture 427	(1-0)	1
Seminar		
Elective		7
		18

Second Semester		Credit
Entomology 405	(2-2)	3
Fruit and Vegetable Insects		
History 306	(3-0)	3
American National Government		
Rural Sociology 407	(3-0)	3
Rural Life Problems		
Elective		9
		18

For a Major in POULTRY HUSBANDRY (Group 11)

FRESHMAN AND SOPHOMORE YEARS

(See page 105)

JUNIOR YEAR

Agricultural Economics 314	(3-0)	3
Marketing Farm Products		
Genetics 301	(3-2)	4
Genetics		
Poultry Husbandry 411	(3-2)	4
Poultry Feeding		
Veterinary Physiology and Pharmacology 329	(2-2)	3
Physiology of Farm Animals		
Elective		4
		18

Agronomy 301	(3-2)	4
Introductory Soils		
History 306	(3-0)	3
American National Government		
Poultry Husbandry 303	(2-0)	2
Turkey Production		
Poultry Husbandry 308	(2-3)	3
Hatchery Management		
Veterinary Bacteriology and Hygiene 334	(2-2)	3
Poultry Pathology		
Elective		3
		18

SENIOR YEAR

English 301	(3-0)	
Writing for Professional Men		
Or		
Journalism 415	(2-2)	3
Agricultural Journalism		
*History 325	(3-0)	3
Trends in American History		
Poultry Husbandry 407	(2-2)	3
Technology and Marketing of Poultry and Poultry Products		
Poultry Husbandry 414	(2-2)	3
Poultry Breeding		
Poultry Husbandry 449	(1-0)	1
Poultry Seminar		
Elective		5
		18

English 403	(1-2)	2
Speaking for Professional Men		
Poultry Husbandry 450	(1-0)	1
Poultry Seminar		
Rural Sociology 407	(3-0)	3
Rural Life Problems		
Elective		12
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

For a Major in FLORICULTURE (Group 14)

Option in Commercial Floriculture or Nursery Management

FRESHMAN YEAR

First Semester		Credit
Agronomy 105 Fundamentals of Crop Production	(2-2)	3
Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 102 Taxonomy of Flowering Plants	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Entomology 201 General Entomology	(2-2)	3
Horticulture 201 General Horticulture	(2-2)	3
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

Chemistry 223 Elementary Quantitative Analysis	(2-3)	3
Economics 205 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Floriculture 120 Ornamental Plant Production	(2-2)	3
Floriculture 222 Greenhouse Construction and Management	(2-2)	3
Military or Air Science	(0-3)	1
Psychology 303 Psychology for Technical Students	(3-0)	3
Physical Education 201	(0-2)	R
		18

Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 231 Elementary Organic Chemistry	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Floriculture 220 Propagation of Ornamental Plants	(2-2)	3
Landscape Architecture 206 Ornamental Plant Materials	(2-2)	3
Military or Air Science	(0-3)	1
Physics 213 Physics for Students of Agriculture	(2-2)	3
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Agronomy 301 Introductory Soils	(3-2)	4
Business Administration 205 Marketing	(3-0)	3
Plant Physiology and Pathology 313 Introduction to Plant Physiology	(2-3)	3
Elective		8
		18

English 403 Speaking for Professional Men	(1-2)	2
Floriculture 320 Garden Management	(2-2)	3
Genetics 301 Genetics	(3-2)	4
History 306 American National Government	(3-0)	3
Elective		6
		18

NOTE: Electives should be chosen according to the following policy:

1. COMMERCIAL FLORICULTURE: Students majoring in commercial floriculture should elect Floriculture 321 the first semester of the junior year and Floriculture 426 in the second semester of the junior year.
2. NURSERY MANAGEMENT: Students majoring in nursery management should elect Landscape Architecture 403 in the first semester of the junior year and Floriculture 323 in the second semester of the junior year.

SENIOR YEAR

First Semester	Credit	Second Semester	Credit
English 301 (3-0) Writing for Professional Men	3	Floriculture 422 (3-3) Outdoor Production Methods	4
Floriculture 421 (3-3) Marketing of Ornamental Plants	4	Floriculture 427 (1-0) Seminar	1
Plant Physiology and Pathology 301 (2-3) Plant Pathology	3	History 325 (3-0) Trends in American History	3
Elective	8	Landscape Architecture 308 (2-0) Park and Recreational Development	2
	18	Elective	8
			18

Curricula in AGRICULTURAL ADMINISTRATION

(For Majors in Agricultural Economics, Farm Management, Rural Sociology)

FRESHMAN YEAR

Agricultural Economics 105 (3-0) Introduction to Rural Economy	3	Agronomy 105 (2-2) Fundamentals of Crop Production	3
Biology 107 (2-3) Vertebrate Zoology	3	Animal Husbandry 107 (2-3) General Animal Husbandry	3
Chemistry 101 (3-3) General Chemistry	4	Biology 101 (2-3) General Botany of Seed Plants	3
English 103 (3-0) Composition and Rhetoric	3	Chemistry 102 (3-3) General Chemistry	4
Mathematics 101 (3-0) Algebra	3	English 104 (3-0) Composition and Rhetoric	3
Military or Air Science (0-3)	1	Military or Air Science (0-3)	1
Physical Education 101 (0-2)	R	Elective	1
	17	Physical Education 102 (0-2)	R
			18

For a Major in AGRICULTURAL ECONOMICS (Group 1)

Option in Agricultural Business Administration, Agricultural Marketing, and Agricultural Economics

FRESHMAN YEAR

(See above)

SOPHOMORE YEAR

Business Administration 209 (2-3) Principles of Accounting	3	Agricultural Economics 314 (3-0) Marketing Farm Products	3
Dairy Husbandry 202 (2-2) Dairying	3	Business Administration 210 (2-3) Principles of Accounting	3
Economics 203 (3-0) Principles of Economics	3	Economics 204 (3-0) Principles of Economics	3
English 203 (2-0) Composition and Literature	2	English 210 (2-0) Writing and Discussion	2
Horticulture 201 (2-2) General Horticulture	3	History 306 (3-0) American National Government	3
Military or Air Science (0-3)	1	Military or Air Science (0-3)	1
Poultry Husbandry 201 (2-2) Poultry Production	3	Elective	3
Physical Education 201 (0-2)	R	Physical Education 202 (0-2)	R
	18		18

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Agricultural Economics 413 Cooperation in Agriculture	(3-0)	3	**Agricultural Economics 315** Economic History of Agriculture	(3-0)	3
Agricultural Economics 422 Land Economics	(3-0)	3	**Economics 311** Money and Banking	(3-0)	3
Agronomy 309 General Soils	(3-0)	3	**Rural Sociology 407** Rural Life Problems	(3-0)	3
Business Administration 303 Statistical Method	(3-3)	4	**Elective**		9
Elective		5			18
		18			

SENIOR YEAR

Agricultural Economics 324 Agricultural Prices	(3-0)	3	**Agricultural Economics 429** Public Policies Affecting Agriculture	(3-0)	3
Agricultural Economics 430 Agricultural Finance	(3-0)	3	**English 403** Speaking for Professional Men	(1-2)	2
Agricultural Economics 481 Seminar	(1-0)	1	**Elective**		13
English 301 Writing for Professional Men	(3-0)	3			18
***History 325** Trends in American History	(3-0)	3			
Elective		5			
		18			

NOTE: Electives shall be chosen and approved according to the following policy:

1. AGRICULTURAL BUSINESS ADMINISTRATION: Students preparing for work with business concerns allied with agriculture should elect from 9 to 18 credit hours of work in business administration and economics.
2. AGRICULTURAL MARKETING: Students preparing for work in agricultural marketing should elect from 9 to 18 hours in courses dealing with the production, grading, and marketing of commodities in which they are interested.
3. AGRICULTURAL ECONOMICS: Students preparing for professional work in agricultural economics and expecting to take graduate training should elect courses in the various social sciences, including courses in advanced economic theory.
4. Not more than 6 elective hours of advanced courses in agricultural economics will be permitted toward requirements for graduation.

For a Major in FARM MANAGEMENT (Group 2)

FRESHMAN YEAR

(See page 114)

SOPHOMORE YEAR

Chemistry 223 Elementary Quantitative Analysis	(2-3)	3	**Agricultural Engineering 201** Farm Power and Machinery	(2-2)	3
Dairy Husbandry 202 Dairying	(2-2)	3	**Biology 206** Introductory Bacteriology	(2-4)	3
English 203 Composition and Literature	(2-0)	2	**Chemistry 231** Elementary Organic Chemistry	(3-0)	3
Entomology 201 General Entomology	(2-2)	3	**English 210** Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1	**Horticulture 201** General Horticulture	(2-2)	3
Physics 213 Physics for Students of Agriculture	(2-2)	3	**Military or Air Science**	(0-3)	1
Elective		3	**Poultry Husbandry 201** Poultry Production	(2-2)	3
Physical Education 201	(0-2)	R	**Physical Education 202**	(0-2)	R
		18			18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

JUNIOR YEAR

First Semester		Credit
Agricultural Economics 321	(1-3)	2
Farm and Ranch Records and Accounts		
Agronomy 301	(3-2)	4
Introductory Soils		
Economics 403	(3-0)	3
Principles of Economics		
Genetics 301	(3-2)	4
Genetics		
History 306	(3-0)	3
American National Government		
Elective		2
		18

Second Semester		Credit
Agricultural Economics 314	(3-0)	3
Marketing Farm Products		
Animal Husbandry 303	(3-0)	3
Animal Nutrition		
Business Administration 303	(3-3)	4
Statistical Method		
Rural Sociology 407	(3-0)	3
Rural Life Problems		
Elective		5
		18

SENIOR YEAR

Agricultural Economics 324	(3-0)	3
Agricultural Prices		
Agricultural Economics 421	(2-2)	3
Principles of Farm and Ranch Management		
Agricultural Economics 481	(1-0)	1
Seminar		
*History 325	(3-0)	3
Trends in American History		
Journalism 415	(2-2)	3
Agricultural Journalism		
Elective		5
		18

Agricultural Economics 429	(3-0)	3
Public Policies Affecting Agriculture		
Agricultural Economics 432	(1-3)	2
Farm and Ranch Organization and Operation		
English 403	(1-2)	2
Speaking for Professional Men		
Elective		11
		18

NOTE: Electives shall be chosen and approved according to the following policy:

1. Not more than 6 elective hours of advanced courses in agricultural economics will be permitted toward requirements for graduation.
2. Other electives shall be selected with view to strengthening the student's preparation for farm operation.

For a Major in RURAL SOCIOLOGY (Group 3)

FRESHMAN YEAR

(See page 114)

SOPHOMORE YEAR

English 203	(2-0)	2
Composition and Literature		
History 306	(3-0)	3
American National Government		
Military or Air Science	(0-3)	1
Poultry Husbandry 201	(2-2)	3
Poultry Production		
Psychology 207	(3-0)	3
General Psychology		
Rural Sociology 205	(3-0)	3
Principles of Sociology		
Elective		3
Physical Education 201	(0-2)	R
		18

Dairy Husbandry 202	(2-2)	3
Dairying		
Economics 205	(3-0)	3
Principles of Economics		
English 210	(2-0)	2
Writing and Discussion		
Horticulture 201	(2-2)	3
General Horticulture		
Military or Air Science	(0-3)	1
Rural Sociology 206	(3-0)	3
Principles of Sociology		
Elective		3
Physical Education 202	(0-2)	R
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

JUNIOR YEAR

First Semester		Credit
Agronomy 309 General Soils	(3-0)	3
Business Administration 303 Statistical Method	(3-3)	4
Education 321 Secondary School Methods	(3-0)	3
Rural Sociology 311 Social Psychology	(3-0)	3
Elective		5
		18

Second Semester		Credit
Education 322 Secondary School Administration	(3-0)	3
Journalism 415 Agricultural Journalism	(2-2)	3
Rural Sociology 314 Social Problems	(3-0)	3
Elective		9
		18

SENIOR YEAR

Agricultural Economics 422 Land Economics	(3-0)	3
Agricultural Economics 481 Seminar	(1-0)	1
Civil Engineering 406 Sanitation and Public Health	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Rural Sociology 306 Rural Social Work	(3-0)	3
Rural Sociology 404 Rural Organization	(3-0)	3
Elective		3
		18

Agricultural Economics 429 Public Policies Affecting Agriculture	(3-0)	3
History 325 Trends in American History	(3-0)	3
Elective		12
		18

NOTE: All electives must be approved by the Head of the Department. Not more than 12 elective credit hours of advanced courses in rural sociology may be applied toward requirements for graduation.

Program Preparatory to Seminary Training of Rural Ministers and Agricultural Missionaries* (Group 4)

FRESHMAN YEAR

(Same as for Agricultural Administration, page 114)

SOPHOMORE YEAR

Dairy Husbandry 202 Dairying	(2-2)	3
English 203 Composition and Literature	(2-0)	2
Entomology 201 General Entomology	(2-2)	3
Horticulture 201 General Horticulture	(2-2)	3
Military or Air Science	(0-3)	1
Physics 213 Physics for Students of Agriculture	(2-2)	3
Rural Sociology 205 Principles of Sociology	(3-0)	3
Physical Education 201	(0-2)	R
		18

Agricultural Engineering 201 Farm Power and Machinery	(2-2)	3
Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 231 Elementary Organic Chemistry	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Psychology 207 General Psychology	(3-0)	3
Elective		3
Physical Education 202	(0-2)	R
		18

*Pre-seminary students desiring to emphasize rural social science may major in the rural sociology program.

JUNIOR YEAR

First Semester	Credit	Second Semester	Credit
Agronomy 301 (3-2) Introductory Soils	4	**Agricultural Economics 314** (3-0) Marketing Farm Products	3
Economics 403 (3-0) Principles of Economics	3	**Genetics 301** (3-2) Genetics	4
History 306 (3-0) American National Government	3	**History 307** (3-0) State and Local Government	3
Rural Sociology 306 (3-0) Rural Social Work	3	**Journalism 415** (2-2) Agricultural Journalism	3
Elective	5	**Rural Sociology 206** (3-0) Principles of Sociology	3
	18	**Elective**	2
			18

SENIOR YEAR

Agricultural Economics 413 (3-0) Cooperation in Agriculture	3	**Agricultural Economics 422** (3-0) Land Economics	3
Agricultural Economics 481 (1-0) Seminar	1	**Agricultural Economics 429** (3-0) Public Policies Affecting Agriculture	3
Animal Husbandry 303 (3-0) Animal Nutrition	3	**English 403** (1-2) Speaking for Professional Men	2
Education 321 (3-0) Secondary School Methods	3	**Rural Sociology 311** (3-0) Social Psychology	3
History 325 (3-0) Trends in American History	3	**Rural Sociology 315** (3-0) The Family	3
Rural Sociology 404 (3-0) Rural Organization	3	**Elective**	4
Elective	2		18
	18		

Curriculum in AGRICULTURAL EDUCATION

FRESHMAN YEAR

(Same as for Agriculture, page 105)

SOPHOMORE YEAR

Chemistry 231 (3-0) Elementary Organic Chemistry	3	**Agricultural Engineering 201** (2-2) Farm Power and Machinery	3
Dairy Husbandry 202 (2-2) Dairying	3	**Agricultural Engineering 325** (2-2) Farm Electricity	3
Economics 205 (3-0) Principles of Economics	3	**Biology 206** (2-4) Introductory Bacteriology	3
English 203 (2-0) Composition and Literature	2	**English 210** (2-0) Writing and Discussion	2
Entomology 201 (2-2) General Entomology	3	***History 305** (3-0) Government of the United States and Texas	3
Military or Air Science (0-3)	1	**Horticulture 201** (2-2) General Horticulture	3
Physics 213 (2-2) Physics for Students of Agriculture	3	**Military or Air Science** (0-3)	1
Physical Education 201 (0-2)	R	**Physical Education 202** (0-2)	R
	18		18

*Students who do not have credit for Basic ROTC must take History 306 and 307 in place of History 305.

JUNIOR YEAR

First Semester		Credit
Agricultural Education 301 Principles of Agricultural Education	(3-0)	3
Agricultural Engineering 221 Farm Shop	(1-3)	2
Agricultural Engineering 333 Surveying and Water Utilization	(2-3)	3
Agronomy 301 Introductory Soils	(3-2)	4
Animal Husbandry 303 Animal Nutrition	(3-0)	3
Elective		3
		18

Second Semester		Credit
Agricultural Economics 314 Marketing Farm Products	(3-0)	3
Agricultural Education 425 Course Building	(2-0)	2
Agricultural Education 427 Methods of Developing Farming Programs	(1-2)	2
Agricultural Engineering 222 Farm Shop	(1-3)	2
Agronomy 308 Forage Crops	(2-2)	3
Genetics 301 Genetics	(3-2)	4
Elective		3
		19

SENIOR YEAR

Agricultural Economics 421 Principles of Farm and Ranch Management	(2-2)	3
Agricultural Education 426 Methods in Adult Agricultural Education	(2-0)	2
Agricultural Education 431 Student Teaching in Vocational Agriculture	(2-2)	3
Animal Husbandry 416 Livestock Management	(2-2)	3
Dairy Husbandry 420 Dairy Management	(2-2)	3
****History 325** Trends in American History	(3-0)	3
Journalism 415 Agricultural Journalism	(2-2)	3
		20

Agricultural Education 430 Administration and Supervision of Vocational Agriculture	(2-0)	2
Agricultural Education 432 Student Teaching in Vocational Agriculture	(2-2)	3
Agronomy 418 Soil Conservation	(3-3)	4
English 403 Speaking for Professional Men	(1-2)	2
Poultry Husbandry 401 Management and Selection	(2-2)	3
Psychology 301 Educational Psychology	(3-0)	3
Elective		3
		20

Curriculum in AGRICULTURAL ENGINEERING

FRESHMAN YEAR

Chemistry 101 General Chemistry	(3-3)	4
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Chemistry 102 General Chemistry	(3-3)	4
Engineering Drawing 106 Descriptive Geometry	(0-6)	2
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 104 Analytics	(3-0)	3
Mechanical Engineering 108 Engineering Problems	(2-3)	3
Military or Air Science	(0-3)	1
Elective		2
Physical Education 102	(0-2)	R
		18

**Students completing 12 hours of Advanced ROTC may substitute 3 hours of ROTC for History 325.

SOPHOMORE YEAR

First Semester		Credit
Agricultural Engineering 205	(2-3)	3
Farm Buildings and Structures		
Agronomy 105	(2-2)	3
Fundamentals of Crop Production		
English 203	(2-0)	2
Composition and Literature		
Mathematics 209	(3-0)	3
Calculus		
Military or Air Science	(0-3)	1
Physics 203	(4-3)	5
General Physics		
Physical Education 201	(0-2)	R
		17

Second Semester		Credit
Agricultural Engineering 208	(3-3)	4
Farm Machinery		
Animal Husbandry 107	(2-3)	3
General Animal Husbandry		
English 210	(2-0)	2
Writing and Discussion		
Mathematics 210	(3-0)	3
Calculus		
Military or Air Science	(0-3)	1
Physics 204	(4-3)	5
General Physics		
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Agricultural Engineering 323	(2-2)	3
Farm Power		
Civil Engineering 201	(3-3)	4
Plane Surveying		
Dairy Husbandry 202	(2-2)	3
Dairying		
History 306	(3-0)	3
American National Government		
Mechanical Engineering 212	(3-0)	3
Engineering Mechanics		
Elective		3
		19

Agricultural Engineering 324	(3-3)	4
Automotive Machinery		
Agronomy 301	(3-2)	4
Introductory Soils		
Civil Engineering 305	(3-0)	3
Mechanics of Materials		
Civil Engineering 311	(3-0)	3
Hydraulics		
Civil Engineering 336	(0-2)	1
Hydraulics Laboratory		
Elective		3
		18

SENIOR YEAR

Agricultural Engineering 418	(2-3)	3
Farm Home Utilities		
Agricultural Engineering 425	(1-0)	1
Seminar		
Agricultural Engineering 428	(2-3)	3
Soil and Water Conservation Engineering		
Business Administration 305	(3-0)	3
Business Law		
Economics 403	(3-0)	3
Principles of Economics		
English 403	(1-2)	2
Speaking for Professional Men		
*History 325	(3-0)	3
Trends in American History		
Elective		1
		19

Agricultural Engineering 410	(2-3)	3
Irrigation and Drainage Engineering		
Agricultural Engineering 413	(2-3)	3
Farm Structures Design		
Agricultural Engineering 426	(1-0)	1
Seminar		
Agricultural Engineering 430	(2-3)	3
Farm Electrification Engineering		
English 301	(3-0)	3
Writing for Professional Men		
Elective		6
		19

*Students completing 12 hours of advanced ROTC may substitute 8 hours of ROTC for History 325.

Curriculum in AGRICULTURAL JOURNALISM

FRESHMAN AND SOPHOMORE YEARS

(Same as for Agriculture, page 105, except that students substitute Journalism 201 for Chemistry 223 and take Journalism 202 as a sophomore elective.)

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Agronomy 301 Introductory Soils	(3-2)	4	Agricultural Economics 314 Marketing Farm Products	(3-0)	3
Genetics 301 Genetics	(3-2)	4	Animal Husbandry 303 Animal Nutrition	(3-0)	3
Journalism 307 News Editing	(2-2)	3	Journalism 205 Principles of Typography	(2-2)	3
Physics 315 Photography	(1-3)	2	Journalism 311 Radio News Writing	(2-2)	3
Elective		5	Elective		6
		18			18

SENIOR YEAR

English 403 Speaking for Professional Men	(1-2)	2	Agricultural Economics 429 Public Policies Affecting Agriculture	(3-0)	3
History 306 American National Government	(3-0)	3	History 325 Trends in American History	(3-0)	3
Journalism 304 Feature Story Writing	(2-2)	3	Journalism 422 Methods and Problems of Journalism	(0-6)	2
Journalism 308 Newspaper Advertising	(2-2)	3	Rural Sociology 407 Rural Life Problems	(3-0)	3
Elective		7	Elective		7
		18			18

NOTE: Electives shall include at least 10 hours of advanced courses in agriculture.

Curriculum in ANIMAL SCIENCE

FRESHMAN YEAR

Animal Husbandry 107 General Animal Husbandry	(2-3)	3	Biology 101 General Botany of Seed Plants	(2-3)	3
Biology 107 Vertebrate Zoology	(2-3)	3	Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4	Chemistry 102 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3	English 104 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3	Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R	Elective		1
		17	Physical Education 102	(0-2)	R
					18

SOPHOMORE YEAR

First Semester		Credit
Biology 206 Introductory Bacteriology	(2-4)	3
English 203 Composition and Literature	(2-0)	2
Mathematics 104 Analytics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Elective		5
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemistry 216 Quantitative Analysis	(2-6)	4
English 210 Writing and Discussion	(2-0)	2
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Elective		4
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Biology 335 Gross and Microscopic Vertebrate Anatomy	(2-3)	3
Chemistry 301 Organic Chemistry	(3-3)	4
Genetics 301 Genetics	(3-2)	4
Elective		7
		18

Animal Husbandry 303 Animal Nutrition	(3-0)	3
Biology 344 Embryology	(2-3)	3
Chemistry 302 Organic Chemistry	(3-3)	4
Economics 403 Principles of Economics	(3-0)	3
Elective		5
		18

SENIOR YEAR

Agronomy 301 Introductory Soils	(3-2)	4
Biology 433 General Physiology	(3-3)	4
English 301 Writing for Professional Men	(3-0)	3
Genetics 406 Biometry—Experimental Technique	(2-3)	3
Elective		4
		18

English 403 Speaking for Professional Men	(1-2)	2
History 306 American National Government	(3-0)	3
History 325 Trends in American History	(3-0)	3
Elective		10
		18

NOTE: The animal science curriculum is designed primarily to qualify students for graduate study. A student who elects this curriculum should select electives on recommendation of his major advisor.

This curriculum is arranged so that a student may qualify for a major in a special field of agriculture.

Curriculum in FOOD TECHNOLOGY

FRESHMAN YEAR

Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 116 Plane Trigonometry and Analytics	(4-0)	4
Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		17

SOPHOMORE YEAR

First Semester		Credit
Business Administration 227 Principles of Accounting	(3-3)	4
Chemistry 205 Qualitative Analysis	(2-6)	4
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemistry 216 Quantitative Analysis	(2-6)	4
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Elective		4
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Agricultural Economics 314 Marketing Farm Products	(3-0)	3
Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 301 Organic Chemistry	(3-3)	4
Elective		8
		18

Agricultural Engineering 213 Food Plant Engineering	(2-3)	3
Chemistry 302 Organic Chemistry	(3-3)	4
Dairy Husbandry 326 Food Preservation and Decomposition	(3-3)	4
Elective		7
		18

SENIOR YEAR

Business Administration 303 Statistical Method	(3-3)	4
English 403 Speaking for Professional Men	(1-2)	2
History 325 Trends in American History	(3-0)	3
Psychology 207 General Psychology	(3-0)	3
Elective		7
		19

Biochemistry and Nutrition 401 Human Nutrition	(3-0)	3
Business Administration 309 Food and Drug Law	(3-0)	3
Chemistry 342 Physical Chemistry	(3-3)	4
English 301 Writing for Professional Men	(3-0)	3
Elective		6
		19

NOTE: Students enrolled in advanced military or air science will elect 15 hours in one food field. Students not enrolled in advanced military or air science will elect 24 hours in two food fields but not less than 15 in one of them; they will elect 6 hours outside the School of Agriculture.

Curriculum in LANDSCAPE ARCHITECTURE

FRESHMAN YEAR

Architecture 101 Architecture I	(0-9)	3
Biology 101 General Botany of Seed Plants	(2-3)	3
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		15

Architecture 102 Architecture I	(0-9)	3
Engineering Drawing 106 Descriptive Geometry	(0-6)	2
English 104 Composition and Rhetoric	(3-0)	3
Horticulture 201 General Horticulture	(2-2)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1
Elective		2
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

First Semester		Credit
Architecture 201 Architecture II	(0-15)	5
Civil Engineering 201 Plane Surveying	(3-3)	4
Economics 205 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Floriculture 120 Ornamental Plant Production	(2-2)	3
Military or Air Science	(0-3)	1
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Architecture 202 Architecture II	(0-15)	5
Civil Engineering 202 Advanced Surveying	(2-3)	3
English 210 Writing and Discussion	(2-0)	2
History 306 American National Government	(3-0)	3
Landscape Architecture 206 Ornamental Plant Materials	(2-2)	3
Military or Air Science	(0-3)	1
Elective		1
Physical Education 202	(0-2)	R
		18

SUMMER WORK

Landscape Architecture 300, Summer Practice, 10 weeks.

JUNIOR YEAR

Architecture 305 Freehand Drawing	(0-3)	1
English 301 Writing for Professional Men	(3-0)	3
Landscape Architecture 301 Intermediate Landscape Design	(1-15)	6
Landscape Architecture 310 History of Landscape Architecture	(3-0)	3
Landscape Architecture 403 Advanced Ornamental Plants and Planting	(2-2)	3
Elective		3
		19

Architecture 306 Freehand Drawing	(0-3)	1
Landscape Architecture 308 Park and Recreational Development	(2-0)	2
Landscape Architecture 311 Intermediate Landscape Design	(1-15)	6
Landscape Architecture 312 Landscape Construction	(2-3)	3
Elective		6
		18

SENIOR YEAR

Business Administration 305 Business Law	(3-0)	3
Landscape Architecture 401 Advanced Landscape Design	(1-15)	6
Landscape Architecture 406 Planting Design	(2-3)	3
Elective		6
		18

Architecture 330 Art and Civilization	(2-0)	2
Architecture 556 City Planning	(2-3)	3
English 403 Speaking for Professional Men	(1-2)	2
History 325 Trends in American History	(3-0)	3
Landscape Architecture 402 Advanced Landscape Design	(1-15)	6
Elective		3
		19

Curriculum in PLANT AND SOIL SCIENCE

FRESHMAN YEAR

First Semester		Credit
Agronomy 105 Fundamentals of Crop Production	(2-2)	3
Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 327 Fundamental Plant Morphology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Elective		4
Physical Education 102	(0-2)	R
		18

NOTE: Students must select all electives with the advice of the head of the department in which they expect to take their major work

SOPHOMORE YEAR

Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 205 Qualitative Analysis	(2-6)	4
English 203 Composition and Literature	(2-0)	2
Mathematics 104 Analytics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Physical Education 201	(0-2)	R
		17

Chemistry 216 Quantitative Analysis	(2-6)	4
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Elective		5
Physical Education 202	(0-2)	R
		19

JUNIOR YEAR

Agronomy 301 Introductory Soils	(3-2)	4
Chemistry 301 Organic Chemistry	(3-3)	4
Genetics 301 Genetics	(3-2)	4
Plant Physiology and Pathology 313 Introduction to Plant Physiology	(2-3)	3
Elective		3
		18

Chemistry 302 Organic Chemistry	(3-3)	4
English 403 Speaking for Professional Men	(1-2)	2
Plant Physiology and Pathology 314 Principles of Plant Physiology	(3-3)	4
Elective		8
		18

SENIOR YEAR

English 301 Writing for Professional Men	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		12
		18

Genetics 406 Biometry—Experimental Technique	(2-3)	3
History 325 Trends in American History	(3-0)	3
Elective		12
		18

Curriculum in RANGE AND FORESTRY

FRESHMAN YEAR

First Semester		Credit
Animal Husbandry 107 General Animal Husbandry	(2-3)	3
Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Agronomy 105 Fundamentals of Crop Production	(2-2)	3
Biology 102 Taxonomy of Flowering Plants	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 223 Elementary Quantitative Analysis	(2-3)	3
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Military or Air Science	(0-3)	1
Range and Forestry 202 Range Plants	(2-3)	3
Wildlife Management 201 Wildlife Conservation and Management	(3-0)	3
Physical Education 201	(0-2)	R
		18

Chemistry 231 Elementary Organic Chemistry	(3-0)	3
Civil Engineering 208 Topographic Surveying	(1-3)	2
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Geology 309 Agricultural Geology	(3-3)	4
Military or Air Science	(0-3)	1
Elective		3
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Agronomy 301 Introductory Soils	(3-2)	4
English 403 Speaking for Professional Men	(1-2)	2
Plant Physiology and Pathology 313 Introduction to Plant Physiology	(2-3)	3
Range and Forestry 303 Agrostology	(2-3)	3
Range and Forestry 304 Range Management	(2-3)	3
Elective		3
		18

Agronomy 308 Forage Crops	(2-2)	3
Animal Husbandry 303 Animal Nutrition	(3-0)	3
Genetics 301 Genetics	(3-2)	4
Range and Forestry 301 Plant and Range Ecology	(2-3)	3
Range and Forestry 308 Farm Forestry	(2-3)	3
Elective		2
		18

SENIOR YEAR

First Semester		Credit
Animal Husbandry 416 Livestock Management	(2-2)	3
***History 325** Trends in American History	(3-0)	3
Range and Forestry 309 Silvics and Silviculture	(2-3)	3
Wildlife Management 403 Ecology of Animals and Plants	(2-3)	3
Elective		6
		18

Second Semester		Credit
Agricultural Economics 422 Land Economics	(3-0)	3
Agronomy 410 Soil Morphology	(1-4)	2
English 301 Writing for Professional Men	(3-0)	3
Range and Forestry 409 Advanced Range Management	(2-3)	3
Elective		7
		18

NOTE: All majors in range and forestry will be required to take the summer field course, Range and Forestry 407, Range Practice, credit 3.

Curriculum in WILDLIFE MANAGEMENT

FRESHMAN YEAR

(Same as for Range and Forestry, page 126)

SOPHOMORE YEAR

Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 223 Elementary Quantitative Analysis	(2-3)	3
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Military or Air Science	(0-3)	1
Range and Forestry 307 Elementary Forestry	(2-3)	3
Wildlife Management 201 Wildlife Conservation and Management	(3-0)	3
Physical Education 201	(0-2)	R
		18

Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 231 Elementary Organic Chemistry	(3-0)	3
Civil Engineering 208 Topographic Surveying	(1-3)	2
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Geology 309 Agricultural Geology	(3-3)	4
Military or Air Science	(0-3)	1
Physical Education 202	(0-2)	R
		18

NOTE: Students planning to major in fisheries will substitute Physics 201, 202 for Chemistry 231 and History 306 in the sophomore year.

JUNIOR YEAR

English 403 Speaking for Professional Men	(1-2)	2
Entomology 313 Biology of Insects	(2-3)	3
Genetics 301 Genetics	(3-2)	4
Rural Sociology 407 Rural Life Problems	(3-0)	3
Wildlife Management 401 General Mammalogy	(2-2)	3
Elective		3
		18

Agronomy 301 Introductory Soils	(3-2)	4
Range and Forestry 301 Plant and Range Ecology	(2-3)	3
Wildlife Management 304 Conservation and Management of Fishes	(3-0)	3
Wildlife Management 315 Herpetology	(2-2)	3
Wildlife Management 402 General Ornithology	(2-2)	3
Elective		2
		18

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

SENIOR YEAR

First Semester		Credit
English 301 Writing for Professional Men	(3-0)	3
Genetics 406 Biometry—Experimental Technique	(2-3)	3
***History 325** Trends in American History	(3-0)	3
Wildlife Management 311 Ichthyology (Fresh Water)	(2-3)	3
Wildlife Management 403 Ecology of Animals and Plants	(2-3)	3
Elective		3
		18

Second Semester		Credit
Agricultural Economics 422 Land Economics	(3-0)	3
Journalism 415 Agricultural Journalism	(2-2)	3
Wildlife Management 408 Techniques of Wildlife Management	(2-3)	3
Elective		9
		18

NOTES: 1. Majors in wildlife management are required to participate in the summer field course, Wildlife Management 300, prior to graduation.
2. A minimum of 15 elective credit hours must be taken outside the student's major department.

FISHERIES OPTION

JUNIOR YEAR

Biology 435 Advanced Invertebrate Zoology	(3-3)	4
Entomology 313 Biology of Insects	(2-3)	3
Genetics 301 Genetics	(3-2)	4
Wildlife Management 311 Ichthyology (Fresh Water)	(2-3)	3
Elective		4
		18

Agronomy 301 Introductory Soils	(3-2)	4
English 403 Speaking for Professional Men	(1-2)	2
Range and Forestry 301 Plant and Range Ecology	(2-3)	3
Wildlife Management 304 Conservation and Management of Fishes	(3-0)	3
Wildlife Management 312 Ichthyology (Marine)	(2-3)	3
Elective		3
		18

SENIOR YEAR

English 301 Writing for Professional Men	(3-0)	3
Genetics 406 Biometry—Experimental Technique	(2-3)	3
***History 325** Trends in American History	(3-0)	3
Wildlife Management 403 Ecology of Animals and Plants	(2-3)	3
Wildlife Management 413 Limnological Techniques	(1-3)	2
Wildlife Management 417 Biology of Fishes	(2-2)	3
Elective		1
		18

History 306 American National Government	(3-0)	3
Journalism 415 Agricultural Journalism	(2-2)	3
Rural Sociology 407 Rural Life Problems	(3-0)	3
Wildlife Management 414 Limnology	(3-0)	3
Elective		6
		18

NOTES: 1. Majors in fisheries are required to participate in the summer field course, Wildlife Management 400, prior to graduation.
2. A minimum of 13 elective credit hours must be taken outside the student's major department.

*Students completing 12 hours of advanced ROTC may substitute 3 hours of ROTC for History 325.

THE SCHOOL OF ARTS AND SCIENCES

CURRICULA

LIBERAL ARTS

- Economics
- English (Language and Literature)
- History (Including Government)
- Journalism
- Mathematics
- Modern Languages
- Studies Preparatory to Law

BUSINESS ADMINISTRATION

- Accounting
- Building Products Marketing
- Finance
- General Business
- Insurance
- Marketing
- Personnel Administration

PREPARATION FOR TEACHING

- Education
- Physical Education

SCIENCE

- Bacteriology
- Botany
- Chemistry
- Entomology
- Oceanography (Including a Meteorology Option)
- Physics
- Studies Preparatory to Medicine, Dentistry, and Related Fields
- Zoology

COMBINED DEGREE PLAN

Students may also pursue a five-year program combining full professional training with a broad general education to qualify for two degrees—the Bachelor of Science degree in the sciences, or in teacher training, or the Bachelor of Business Administration degree and the Bachelor of Arts degree in one of the liberal arts curricula. The student contemplating such a program is advised to consult the heads of both departments concerned in formulating a combined degree plan. (See page 50, "Two Degrees," and page 89, paragraph 2 under "Curricula.")

LIBERAL ARTS

The curricula in liberal arts leading to the degree of Bachelor of Arts offer carefully planned programs of study in selected areas of the humanities and social sciences. They

are intended for students whose interests, abilities, and aims are better served by a broad general education than by more specialized technological and scientific studies.

After completing one of these curricula, many students enter directly upon their lifework. Others make their liberal arts course the foundation for additional education in a professional or graduate school. Special provision is made for those who wish to begin the study of law before they have completed the program for the Bachelor's degree.

In all of the programs the first two years are given over to introductory work in fundamental subjects. The purpose is to enable the student to attain experience and breadth of view so that he may take a more intelligent part in his own further education. During the last two years the student selects a major and a minor field of study and appropriate electives, under the advice and direction of the Dean of the School of Arts and Sciences.

MAJOR AND MINOR STUDIES

By April 15 of his sophomore year the student selects a major and a minor field of study, according to the following directions:

1. One of the following departments must be chosen as the field of major study: Economics, English, History, Journalism, Mathematics, or Modern Languages.

2. For his minor study the student may select one of the above departments other than that of his major study, or one of the following: Biology, Business Administration, Chemistry, Education, Entomology, Geography, Geology, Journalism, Oceanography (Meteorology Option), Physical Education, Physics, Psychology, or Rural Sociology.

3. The remainder of the elective work may be taken in any of the departments indicated above, or in other departments of the College, subject to the approval of the Dean of the School of Arts and Sciences.

4. To satisfy the requirements for graduation a student must complete not less than thirty semester hours in his major study, of which at least twelve hours are in advanced courses (above the sophomore level), and not less than eighteen semester hours in his minor study, of which at least six hours are in advanced courses. Upon recommendation of the head of the student's major department, the Dean may authorize the substitution of courses in closely related departments for a limited number of hours in the major or minor study.

ELECTIVES

In all curricula, elective hours are shown distributed over several semesters (one, two, or more a semester). The student is not expected to schedule his elective courses only in the units listed. He is free to schedule electives in whatever units he chooses up to and beyond the total number of elective hours in his curriculum. He may also exceed the hour requirement in any semester provided only that the grade points earned in the preceding semester entitle him to carry the desired number of hours.

LATIN AMERICAN STUDIES

A number of departments offer courses relating to Latin America, so that it is possible for many students (including some who are registered in the other schools of the College) to combine some concentration in Latin American studies with their regular departmental major. The program of offerings on Latin America is designed to meet the needs of four classes of students: (1) those who expect to enter into business in Latin America or into trade with Latin America, (2) those who contemplate a career in the foreign service of the United States Government or in any of the several government agencies in Washington which employ specialists on Latin America, with assignments both in the United States and in the foreign field, (3) those who expect to enter into teaching or research with emphasis upon Latin America, and (4) those who wish to broaden their education and acquire a better understanding of the people and the problems of Latin America. Any student who elects to coordinate some study of Latin America with a regular major in one of the college departments should consult the head of his major department for guidance in working out his program of study.

Those courses which bear directly on Latin America include the following:

Economics 440 ..... (3-0) 3
Latin-American Trade
Geography 201 ..... (3-0) 3
Principles of Geography
Geography 301 ..... (3-0) 3
Geography of North America
Geography 303 ..... (3-0) 3
Geography of South America
History 313 ..... (3-0) 3
The Latin-American Nations to 1820
History 314 ..... (3-0) 3
The Latin-American Republics, 1820 to the Present
History 422 ..... (3-0) 3
International Rivalry in the Gulf-Caribbean Area, 1840 to the Present
Modern Language 305 ..... (3-0) 3
Modern Spanish-American Drama
Modern Language 306 ..... (3-0) 3
Modern Spanish-American Drama
Modern Language 325 ..... (1-2) 2
Public Speaking in Spanish
Modern Language 326 ..... (1-2) 2
Public Speaking in Spanish
Modern Language 335 ..... (3-0) 3
Spanish-American Novel
Modern Language 336 ..... (3-0) 3
Spanish-American Novel

FOREIGN LANGUAGE REQUIREMENT

A student whose curriculum includes a foreign language requirement will plan his program of courses according to the circumstances which fit his particular case. If he began the study of a language in high school, he will ordinarily find it advisable to continue the study of that language in college as the best means of developing a command of the language. But no student is required to schedule a language presented for admission, and students majoring in science are normally limited to a choice of French or German even though some other language was presented for admission.

The student will satisfy the language requirement in accordance with the following options:

1. If he presented less than two units of a language for admission to college, he will satisfy the requirement in that language by completing the beginning and intermediate courses (a total of four semesters).

2. If he presented two units of a language for admission, he will satisfy the requirement in that language by completing the intermediate course and six additional semester hours in courses to which the intermediate course is prerequisite. If he is not qualified to enter the intermediate course directly, he may start with the beginning course before undertaking the four semesters of intermediate and advanced courses. This will add six hours to the total number required for graduation in his curriculum, but the beginning course will be permitted to apply toward classification requirements.

3. If he presented three units in one language, or two units in each of two languages, he will satisfy the requirement by completing six semester hours of advanced work in one language presented for admission.

4. If he presented four years of a modern foreign language for admission and can demonstrate an adequate reading knowledge of that language, he will be granted exemption from the language requirement.

In no case does exemption from any part of the language requirement reduce the total number of hours required for graduation in a given curriculum.

THE SOPHOMORE SCIENCE REQUIREMENT

A student whose curriculum includes a sophomore science requirement may satisfy this requirement in one of three ways.

1. Normally, he will schedule any two (one each semester) of the following survey courses: Chemistry 106, Geography 203, Geology 205, Physics 211.

2. Alternatively, he may substitute for the two survey courses any two-semester course in chemistry, geology, or physics.

3. By special permission of the Dean, he may be allowed to substitute the first semester of the usual two-semester introductory course in chemistry, geology, or physics for the survey course in that science. This last provision is intended to prevent unnecessary duplication in the program of students changing from one curriculum to another or transferring from another institution with science credit equivalent to an introductory rather than a survey course.

Curricula in LIBERAL ARTS

FRESHMAN YEAR

(For Majors in Economics, English, History, and Modern Languages)

First Semester		Credit	Second Semester		Credit
Biology 101[1]	(2-3)	3	Biology 107[1]	(2-3)	3
General Botany of Seed Plants			Vertebrate Zoology		
English 103	(3-0)	3	English 104	(3-0)	3
Composition and Rhetoric			Composition and Rhetoric		
History 105	(3-0)	3	History 106	(3-0)	3
History of the United States			History of the United States		
Mathematics 101 or 102	(3-0)	3	Mathematics 103	(3-0)	3
Algebra			Plane Trigonometry		
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language[2]	(3-0)	3	Modern Language[2]	(3-0)	3
French, German, or Spanish			French, German, or Spanish		
Physical Education 101	(0-2)	R	Elective		2
		—	Physical Education 102	(0-2)	R
		16			—
					18

NOTES: 1. Transfers who have credit for any 6 hours of college biology may substitute such credit for Biology 101, 107.
2. See "The Foreign Language Requirement," page 132.

For a Major in ECONOMICS

Most students who major in economics enter upon a business career following their graduation. These students obtain a broad foundation for such a career by combining a judicious selection of courses in business administration with those prescribed in their major program. Other students find it desirable to obtain an undergraduate degree with a major in economics before entering law school. Still others pursue the four-year course in preparation for graduate school study leading to careers in teaching, research, or government service. There are many opportunities in these fields for students with adequate preparation at the graduate level.

FRESHMAN YEAR

(See above)

SOPHOMORE YEAR

Business Administration 209	(2-3)	3	Business Administration 210	(2-3)	3
Principles of Accounting			Principles of Accounting		
Economics 203	(3-0)	3	Economics 204	(3-0)	3
Principles of Economics			Principles of Economics		
English 212	(3-0)	3	English 231 or 232	(3-0)	3
Shakespeare			Survey of English Literature		
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3	Modern Language[1]	(3-0)	3
French, German, or Spanish			French, German, or Spanish		
Science[2]	(3-3)	4	Science[2]	(3-3)	4
Elective		1	Elective		1
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		—			—
		18			18

NOTES: 1. See "The Foreign Language Requirement," page 132.
2. See "The Sophomore Science Requirement," page 132.

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Business Administration 303 Statistical Method	(3-3)	4	Economic History*	(3-0)	3
Economics 323 Economic Analysis	(3-0)	3	Economics 311 Money and Banking	(3-0)	3
Psychology 207 General Psychology Or	(3-0)		Economics (elective)	(3-0)	3
Psychology 303 Psychology for Technical Students	(3-0)	3	History 306 American National Government	(3-0)	3
Elective		7	Elective		5
		17			17

*Credit for Economics 319 (Economic Development of the United States), Economics 320 (Economic Development of Europe), or History 322 (Industrial History of the United States) will satisfy this requirement.

SENIOR YEAR

Economics (elective)	(3-0)	3	Economics 412 Public Finance	(3-0)	3
Economics (elective)	(3-0)	3	Economics (elective)	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2	Economics (elective)	(3-0)	3
Elective		9	Elective		7
		17			16

NOTES: 1. The Department of Economics has prepared a pamphlet containing suggested electives and minor fields of study for those who are interested in a specific objective. The student planning his advanced course of study should refer to this pamphlet and consult with the Head of the Department sometime during the second semester of his sophomore year to make out his degree plan. There is also available a suggested program of work for those who wish to combine a major in economics with Latin American studies.

2. Business Administration 304 or 418 can substitute for three semester hours of economics electives.

3. Junior and senior electives are to be selected after consultation with the student's major advisor.

For a Major in ENGLISH

The curriculum for a major in English is designed for breadth in education. In the Department of English, the English major studies writing skills, the language, and literature. Outside of the Department of English, he is required to study both physical and biological sciences, social sciences, foreign language, history, and philosophy. A large part of the program, however, especially in the junior and senior years, is left to the choice of the student. Through these electives the student may extend his knowledge in the humanities, sciences, social sciences, or even technological skills. The curriculum for the English major, then, is suitable not only for the student who expects to continue his studies of the humanities in graduate school but also for the student who expects to go

into business or to become a student of law or medicine or religion.

The student desiring both a full professional training and a broad general education may in five years complete the requirements for two degrees—Bachelor of Arts in English and Bachelor of Science in any one of the professional fields. For specific degree plans, which are made out for each individual entering this program, the student should consult the Dean of the School of Arts and Sciences and the dean of any other school in which he seeks a professional degree. (For degrees in English and in Engineering, see page 171; in English and in other fields in Arts and Sciences, page 129.)

FRESHMAN YEAR

(See page 134)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
Economics 203 Principles of Economics	(3-0)	3	Economics 204 Principles of Economics	(3-0)	3
English 231 Survey of English Literature	(3-0)	3	English 212 Shakespeare	(3-0)	3
History 213 History of England	(3-0)	3	History 214 History of England	(3-0)	3
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language[1] French, German, or Spanish	(3-0)	3	Modern Language[1] French, German, or Spanish	(3-0)	3
Science[2]	(3-3)	4	Science[2]	(3-3)	4
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			17

NOTES: 1. See "The Foreign Language Requirement," page 132.
2. See "The Sophomore Science Requirement," page 132.

JUNIOR YEAR

English 309 The English Language	(3-0)	3	English 310 Phonetics and Pronunciation	(3-0)	3
English 321 Nineteenth Century Literature	(3-0)	3	English 322 Nineteenth Century Literature	(3-0)	3
History 306 American National Government	(3-0)	3	Elective		12
Elective		8			18
		17			

SENIOR YEAR

English 407 Speaking and Oral Interpretation	(1-2)	2	English (elective)	(3-0)	3
English (elective)	(3-0)	3	Elective		14
Elective		12			17
		17			

For a Major in HISTORY

FRESHMAN YEAR

(See page 134)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
Economics 203 Principles of Economics	(3-0)	3	**Economics 204** Principles of Economics	(3-0)	3
English 212 Shakespeare	(3-0)	3	**English 231 or 232** Survey of English Literature	(3-0)	3
History 217 Development of Europe	(3-0)	3	**History 218** Development of Europe	(3-0)	3
Military or Air Science	(0-3)	1	**Military or Air Science**	(0-3)	1
Modern Language[1] French, German, or Spanish	(3-0)	3	**Modern Language**[1] French, German, or Spanish	(3-0)	3
Science[2]	(3-3)	4	**Science**[2]	(3-3)	4
Physical Education 201	(0-2)	R	**Physical Education 202**	(0-2)	R
		17			17

NOTES: 1. See "The Foreign Language Requirement," page 132.

2. See "The Sophomore Science Requirement," page 132. For one choice the student should select Geography 203 and later elect Geography 204 as a general elective.

JUNIOR YEAR

History 213 History of England	(3-0)	3	**History 214** History of England	(3-0)	3
History 313 The Latin-American Nations to 1820	(3-0)	3	**History 314** The Latin-American Republics, 1820 to the Present	(3-0)	3
History 318 International Developments Since 1918	(3-0)	3	**History 306** American National Government	(3-0)	3
Elective		8	**Elective**		9
		17			18

SENIOR YEAR

English 403 Speaking for Professional Men	(1-2)	2	**History 307** State and Local Government	(3-0)	3
History 423 American Foreign Relations	(3-0)	3	**History 424** American Foreign Relations	(3-0)	3
Elective		12	**Elective**		11
		17			17

NOTES: 1. History 422 (International Rivalry in the Gulf-Caribbean Area, 1840 to the Present) can be substituted for either History 313 or 314, and History 425 (United States Policy in the Far East, 1841 to the Present) for either History 423 or 424.

2. The choice of a minor should depend on the student's future plans. For example, pre-law students and those interested in United States foreign service would do well to choose economics; prospective teachers, education; and those who contemplate graduate work in history, modern foreign languages. Twelve semester hours each in French and German will be of the greatest assistance to those who expect to do graduate work leading to advanced degrees.

3. General electives should usually be chosen from business administration, economics, education, English, geography, modern languages, physical education, psychology, and rural sociology, as well as advanced history courses, some of which are offered only in summers.

For a Major in JOURNALISM

Programs for students majoring in journalism are designed to prepare them for futures in the communications field. By the beginning of the junior year, each student determines, with the advice of members of the Department, what special phase of journalism he wishes to emphasize in his own program — community newspapers, urban newspapers, news-editorial work, advertising, business management, industrial writing and editing, radio journalism. A major in agricultural journalism is available for students interested primarily in the field of technical journalism, serving agriculture.

Upon completing the curriculum, most students enter either the news or advertising departments of newspapers or magazines. Other students find opportunities in the radio field and in public relations.

FRESHMAN YEAR

First Semester		Credit
Biology 115	(3-3)	4
Survey of Biology		
English 103	(3-0)	3
Composition and Rhetoric		
History 105	(3-0)	3
History of the United States		
Mathematics 101	(3-0)	3
Algebra		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
Spanish Recommended		
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
English 104	(3-0)	3
Composition and Rhetoric		
History 106	(3-0)	3
History of the United States		
Mathematics 110	(3-0)	3
Survey Course in Mathematics		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
Spanish Recommended		
Science[2]	(3-3)	4
Elective		1
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

Economics 203	(3-0)	3
Principles of Economics		
English 212	(3-0)	3
Shakespeare		
Journalism 201	(2-2)	3
News Writing		
Military or Air Science	(0-3)	1
Modern Language	(3-0)	3
Spanish Recommended		
Rural Sociology 205	(3-0)	3
Principles of Sociology		
Elective		1
Physical Education 201	(0-2)	R
		17

Economics 204	(3-0)	3
Principles of Economics		
English 232	(3-0)	3
Survey of English Literature		
Journalism 202	(2-2)	3
Beginning News Reporting		
Journalism 205	(2-2)	3
Principles of Typography		
Military or Air Science	(0-3)	1
Modern Language	(3-0)	3
Spanish Recommended		
Elective		1
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

First Semester		Credit
History 306 American National Government	(3-0)	3
Journalism 304 Feature Story Writing	(2-2)	3
Journalism 307 News Editing	(2-2)	3
Journalism 308 Newspaper Advertising	(2-2)	3
Elective		5
		17

Second Semester		Credit
Business Administration 205 Marketing	(3-0)	3
English (elective)[3]		3
Journalism 306 Newspaper Production and Management	(2-2)	3
Elective		8
		17

SENIOR YEAR

English (elective)[3]		2
History 307 State and Local Government	(3-0)	3
Journalism 409 History and Principles of Journalism	(3-0)	3
Journalism 421 Methods and Problems of Journalism	(0-6)	2
Physics 315 Photography	(1-3)	2
Elective		5
		17

English 403 Speaking for Professional Men	(1-2)	2
Journalism 412 Editorial Writing	(3-0)	3
Journalism 422 Methods and Problems of Journalism	(0-6)	2
Elective		10
		17

NOTES:
1. See "The Foreign Language Requirement," page 132.
2. The student may select any one of the following: Chemistry 106, Geography 203, Geology 205, Physics 211.
3. The student may select any one of the following: English 325, 328, 340, 350, 371, 375.
4. The Journalism Department has assembled information on the various areas of emphasis which will prove a valuable guide to a student planning his advanced course of study and choosing his electives at the beginning of the junior year.
5. For further information on agricultural journalism, see pages 100 and 121.

For a Major in MATHEMATICS

FRESHMAN YEAR

Biology 101 General Botany of Seed Plants	(2-3)	3
English 103 Composition and Rhetoric	(3-0)	3
History 105 History of the United States	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Biology 107 Vertebrate Zoology	(2-3)	3
English 104 Composition and Rhetoric	(3-0)	3
History 106 History of the United States	(3-0)	3
Mathematics 104 Analytics	(3-0)	3
Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1
Elective		3
Physical Education 102	(0-2)	R
		17

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
English 212	(3-0)	3	English 231 or 232	(3-0)	3
Shakespeare			Survey of English Literature		
Mathematics 209	(3-0)	3	Mathematics 210	(3-0)	3
Calculus			Calculus		
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language	(3-0)	3	Modern Language	(3-0)	3
French, German, or Spanish			French, German, or Spanish		
Physics 203	(4-3)	5	Physics 204	(4-3)	5
General Physics			General Physics		
Elective		2	Elective		3
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			18

JUNIOR YEAR

Economics 203	(3-0)	3	Economics 204	(3-0)	3
Principles of Economics			Principles of Economics		
History 306	(3-0)	3	Mathematics 308	(3-0)	3
American National Government			Differential Equations		
Mathematics 307	(3-0)	3	Mathematics (elective)		3
Calculus			Modern Language	(3-0)	3
Modern Language	(3-0)	3	French, German, or Spanish		
French, German, or Spanish			Elective		6
Elective		5			18
		17			

SENIOR YEAR

English 403	(1-2)	2	Mathematics (elective)		3
Speaking for Professional Men			Elective		14
Mathematics (elective)		3			17
Elective		12			
		17			

NOTE: The minor field of study should be chosen only after consultation with the Head of the Department of Mathematics, who will help the students arrange a program appropriate to his plans following graduation.

For a Major in MODERN LANGUAGES

FRESHMAN YEAR

(See page 134 with Spanish required as the modern language.)

SOPHOMORE YEAR

Economics 203	(3-0)	3	Economics 204	(3-0)	3
Principles of Economics			Principles of Economics		
English 212	(3-0)	3	English 231 or 232	(3-0)	3
Shakespeare			Survey of English Literature		
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3	Modern Language[1]	(3-0)	3
Spanish			Spanish		
Science[2]	(3-3)	4	Science[2]	(3-3)	4
Elective		3	Elective		3
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			17

JUNIOR YEAR

First Semester		Credit
English 309[3]	(3-0)	3
The English Language		
History 306	(3-0)	3
American National Government		
Modern Language	(3-0)	3
Spanish		
Modern Language	(3-0)	3
French or German		
Elective		5
		17

Second Semester		Credit
English 310[3]	(3-0)	3
Phonetics and Pronunciation		
Modern Language	(3-0)	3
Spanish		
Modern Language	(3-0)	3
French or German		
Elective		9
		18

SENIOR YEAR

English 403	(1-2)	2
Speaking for Professional Men		
History 313[4]	(3-0)	3
The Latin-American Nations to 1820		
Modern Language	(3-0)	3
French or German		
Modern Language		2
Spanish		
Elective		7
		17

History 314[4]	(3-0)	3
The Latin-American Republics, 1820 to the Present		
Modern Language	(3-0)	3
French or German		
Modern Language		2
Spanish		
Elective		9
		17

NOTES: 1. See "The Foreign Language Requirement," page 132. Students who must take beginning Spanish in their freshman year must elect 6 hours of advanced Spanish in their senior year.

2. See "The Sophomore Science Requirement," page 132.

3. For those who do not expect to teach, a substitution in economics or history will be allowed upon approval by the Head of the Department of Modern Languages.

4. In case of unavoidable conflict with another required course, a substitution in the fields of history or economics will be allowed upon approval by the Head of the Department and the Dean of the School of Arts and Sciences.

5. Recommended electives: English 405, or advanced courses in economics, geography, or history.

6. For most students majoring in modern languages, economics, English, and history are logical minors.

Studies Preparatory to LAW

Students who plan to obtain an undergraduate degree before undertaking the study of law will normally register for one of the regular degree programs. Particularly appropriate are the programs in business administration, economics, English, and history. Students who plan to complete no more than three years of undergraduate work before entering law school will matriculate in the three-year preparatory program listed below. Any student who completes this program may still earn a Bachelor of Arts degree with a major in history and a minor in economics by completing one additional year of course

work as follows: History 318 and 423 (first semester), 322 and 424 (second semester), Economics 321 (first semester) and 324 (second semester), English 403, and sixteen hours of electives, including if possible Business Administration 303.

FRESHMAN YEAR

First Semester		Credit
Biology 101	(2-3)	3
General Botany of Seed Plants		
English 103	(3-0)	3
Composition and Rhetoric		
History 105	(3-0)	3
History of the United States		
Mathematics 102	(3-0)	3
Algebra		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
French, German, or Spanish		
Physical Education 101	(0-2)	R
		16

Second Semester		Credit
Biology 107	(2-3)	3
Vertebrate Zoology		
English 104	(3-0)	3
Composition and Rhetoric		
History 106	(3-0)	3
History of the United States		
Mathematics 103	(3-0)	3
Plane Trigonometry		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
French, German, or Spanish		
Elective		1
Physical Education 102	(0-2)	R
		17

SOPHOMORE YEAR

Business Administration 209	(2-3)	3
Principles of Accounting		
Economics 205	(3-0)	3
Principles of Economics		
English 212	(3-0)	3
Shakespeare		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
French, German, or Spanish		
Science[2]	(3-3)	4
Physical Education 201	(0-2)	R
		17

Business Administration 210	(2-3)	3
Principles of Accounting		
Economics 319	(3-0)	3
Economic Development of the United States		
English 231 or 232	(3-0)	3
Survey of English Literature		
Military or Air Science	(0-3)	1
Modern Language[1]	(3-0)	3
French, German, or Spanish		
Science[2]	(3-3)	4
Physical Education 202	(0-2)	R
		17

NOTES: 1. See "The Foreign Language Requirement," page 132.
2. To satisfy the requirement in physical science, the student may choose one of the following: Chemistry 101, 102 or Physics 201, 202.

JUNIOR YEAR

Administration 301	(3-0)	3
Introduction to Philosophy		
Economics 311	(3-0)	3
Money and Banking		
History 213	(3-0)	3
History of England		
History 306	(3-0)	3
American National Government		
Psychology 303	(3-0)	3
Psychology for Technical Students		
Elective		3
		18

Administration 304	(3-0)	3
Philosophies of Life		
Economics 412	(3-0)	3
Public Finance		
History 214	(3-0)	3
History of England		
History 307	(3-0)	3
State and Local Government		
History 308	(3-0)	3
United States Constitutional Development		
Elective		3
		18

NOTE: The American Bar Association minimum requirement for admission to an accredited law school is three years of acceptable college work. Students who plan to seek admission to a law school after completing the three-year program listed above are strongly advised to check the program with the registrar of the school of their choice before beginning the third year. If necessary to meet specific requirements, substitutions may be approved by the Dean of the School of Arts and Sciences.

BUSINESS ADMINISTRATION

The several curricula in business administration provide the type of training for business careers usually offered in schools of business administration. The freshman year is the same in all curricula with the exception of building products marketing. A student who plans to major in building products marketing should follow the prescribed course of study beginning with his freshman year. Other students elect a major field at the beginning of the sophomore year, choosing one of the following: accounting, finance, general business, insurance, marketing, personnel administration.

Each curriculum contains courses essential to a general education and permits the study of fundamental business theory and procedure with limited specialization in one of the major fields. Upon the completion of his chosen curriculum, the student receives the degree of Bachelor of Business Administration.

Curricula in BUSINESS ADMINISTRATION

(For Majors in Accounting, Finance, General Business, Insurance, Marketing, Personnel Administration)

FRESHMAN YEAR

First Semester		Credit	Second Semester		Credit
Biology 115 Survey of Biology	(3-3)	4	English 104 Composition and Rhetoric	(3-0)	3
Business Administration 105 Introduction to Business	(3-0)	3	History 106[1] History of the United States	(3-0)	3
English 103 Composition and Rhetoric	(3-0)	3	Mathematics 110 Survey Course in Mathematics	(3-0)	3
History 105[1] History of the United States	(3-0)	3	Military or Air Science	(0-3)	1
Mathematics 101 Algebra	(3-0)	3	Science[2]	(3-3)	4
Military or Air Science	(0-3)	1	Elective		3
Physical Education 101	(0-2)	R	Physical Education 102	(0-2)	R
		17			17

NOTES: 1. Students who desire to take Spanish or another modern foreign language may substitute six credit hours of the language for History 105, 106 and continue the language for six elective credit hours.

2. Students may select any one of the following: Chemistry 106, Geography 203, Geology 205, Physics 211.

For a Major in ACCOUNTING (Group 1)

The curriculum in accounting offers a professional course of training for employment in commercial and industrial accounting, public accounting, and governmental accounting.

Positions in these fields are generally designated as accountant, public accountant, certified public accountant, tax accountant, auditor, cost accountant, internal auditor, and controller. The basic business training obtained in this curriculum also qualifies graduates for employment eventually leading to executive positions in industry.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 205 Marketing	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4
Economics 203 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 201	(0-2)	R
		16

Second Semester		Credit
Business Administration 228 Principles of Accounting	(3-3)	4
Business Administration 303 Statistical Method	(3-3)	4
Economics 204 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		3
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 327 Intermediate Accounting	(3-3)	4
Business Administration 329 Cost Accounting	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
Elective		4
		17

Business Administration 305 Business Law	(3-0)	3
Business Administration 328 Intermediate Accounting	(3-3)	4
Business Administration 330 Advanced Accounting	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Elective		4
		17

SENIOR YEAR

Business Administration 306 Business Law	(3-0)	3
Business Administration 403 Income Tax	(3-0)	3
Business Administration 407 Auditing	(3-0)	3
Business Administration 418 Corporation Finance	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		4
		18

Business Administration 402 Accounting Systems	(3-0)	3
Business Administration 404 Managerial Accounting	(3-0)	
Or		
Business Administration 408 Auditing	(3-0)	3
Elective		12
		18

NOTE: The following electives are suggested:

Business Administration 206 Purchasing and Control of Materials	(2-0)	2
Business Administration 308 Law of Private Corporations	(3-0)	3
Business Administration 310 Credits and Collections	(2-0)	2
Business Administration 315 Insurance	(3-0)	3
Business Administration 317 Punch-Card Methods	(1-2)	2
Business Administration 322 Property Insurance	(3-0)	3
Business Administration 333 Business Machines	(0-2)	1
Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Business Administration 433 Business Management	(3-0)	3
Economics 323 Economic Analysis	(3-0)	3
Economics 412 Public Finance	(3-0)	3
Economics 424 Economics of Transportation	(3-0)	3

For a Major in
BUILDING PRODUCTS MARKETING
(Group 2)

The curriculum in building products marketing was developed in cooperation with the retail building materials industry, the Lumbermen's Association of Texas, and the National Retail Lumber Dealers Association. It is designed to train persons who plan to seek employment in the retail building materials industry. Students who complete this program will have an educational foundation for responsible positions in this industry.

FRESHMAN YEAR

First Semester		Credit
Business Administration 105 Introduction to Business	(3-0)	3
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Mechanical Engineering 105 Carpentry and Mill Work	(1-6)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		15

Second Semester		Credit
Chemistry 106 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physics 211 A Brief Survey of Physics	(3-3)	4
Elective		2
Physical Education 102	(0-2)	R
		17

SOPHOMORE YEAR

Agricultural Engineering 205 Farm Buildings and Structures	(2-3)	3
Business Administration 205 Marketing	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4
Economics 205 Principles of Economics	(3-0)	3
Engineering Drawing 221 Building Construction Drawing	(1-3)	2
English 203 Composition and Literature	(2-0)	2
Military or Air Science	(0-3)	1
Physical Education 201	(0-2)	R
		18

Business Administration 206 Purchasing and Control of Materials	(2-0)	2
Business Administration 208 Advertising	(3-0)	3
Business Administration 216 Building Products	(0-2)	1
Business Administration 228 Principles of Accounting	(3-3)	4
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		4
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

First Semester		Credit
Business Administration 305 Business Law	(3-0)	3
Business Administration 325 Retailing	(3-0)	3
Business Administration 329 Cost Accounting	(3-0)	3
Civil Engineering 206 Plane Surveying	(0-3)	1
English 301 Writing for Professional Men	(3-0)	3
Elective		4
		17

Second Semester		Credit
Business Administration 303 Statistical Method	(3-3)	4
Business Administration 306 Business Law	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		4
		17

SENIOR YEAR

Business Administration 315 Insurance	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Business Administration 461 Retailing Building Products	(2-0)	2
Mechanical Engineering 335 Mechanical Equipment of Buildings	(3-0)	3
Psychology 303 Psychology for Technical Students	(3-0)	3
Elective		4
		18

Business Administration 418 Corporation Finance	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		7
		18

NOTE: A minimum of 12 weeks of practice in the industry is required. This practice is to be approved in advance by the sponsoring department, and suitable reports are to be submitted on each assignment.

For a Major in FINANCE

(Group 3)

The curriculum in finance provides instruction in the principles, methods, instruments, and institutions of finance with specialized training in the techniques and practices of financial management. The student receives training in accounting, economics, business law, and elective fields which provides a balanced background for specialization in finance.

The principal objective of the program is to prepare students for managerial positions in such fields of business finance as commercial banking, investment banking, securities brokerage, trust management, and property management. The program also provides training for employment with governmental agencies engaged in lending operations and regulation of securities markets.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 205 Marketing	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4
Business Administration 305 Business Law	(3-0)	3
Economics 203 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Military or Air Science	(0-3)	1
Elective		1
Physical Education 201	(0-2)	R
		17

Second Semester		Credit
Business Administration 228 Principles of Accounting	(3-3)	4
Business Administration 306 Business Law	(3-0)	3
Business Administration 315 Insurance	(3-0)	3
Economics 204 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		1
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Business Administration 303 Statistical Method	(3-3)	4
Business Administration 361 Survey of Intermediate Accounting	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Elective		4
		17

Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 310 Credits and Collections	(2-0)	2
Business Administration 418 Corporation Finance	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		6
		17

SENIOR YEAR

Business Administration 308 Law of Private Corporations	(3-0)	3
Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 440 Real Estate Fundamentals	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		6
		17

Business Administration 432 Security Analysis	(3-0)	3
Business Administration 434 Problems in Finance	(3-0)	3
Economics 412 Public Finance	(3-0)	3
Elective		9
		18

NOTE: The following courses are suggested electives:

Agricultural Economics 430 Agricultural Finance	(3-0)	3
Business Administration 320 Life Insurance	(3-0)	3
Business Administration 322 Property Insurance	(3-0)	3
Business Administration 324 Casualty Insurance and Suretyship	(3-0)	3
Business Administration 330 Advanced Accounting	(3-0)	3
Business Administration 352 Personal Finance	(2-0)	2
Business Administration 403 Income Tax	(3-0)	3

Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Business Administration 438 Commercial Bank Management	(3-0)	3
Business Administration 442 Real Estate Practice	(3-0)	3
Economics 422 Monetary Problems and Policies	(3-0)	3

For a Major in GENERAL BUSINESS (Group 4)

Students who do not wish to major in one of the several special fields in business administration should follow the curriculum in general business. This curriculum includes one or more courses in each of the fields of business administration and thereby provides a broad training for business careers. It is designed for those planning to establish their own business or preparing for employment eventually leading to responsible positions in industry.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 205 Marketing	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4
Economics 203 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Military or Air Science	(0-3)	1
Psychology 303 Psychology for Technical Students	(3-0)	3
Elective		1
Physical Education 201	(0-2)	R
		17

Second Semester		Credit
Business Administration 206 Purchasing and Control of Materials	(2-0)	2
Business Administration 208 Advertising	(3-0)	3
Business Administration 228 Principles of Accounting	(3-3)	4
Economics 204 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		2
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Business Administration 303 Statistical Method	(3-3)	4
Business Administration 305 Business Law	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Elective		4
		17

Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 306 Business Law	(3-0)	3
Business Administration 310 Credits and Collections	(2-0)	2
History 306 American National Government	(3-0)	3
Elective		6
		17

SENIOR YEAR

Business Administration 315 Insurance	(3-0)	3
Business Administration 325 Retailing	(3-0)	3
Business Administration 418 Corporation Finance	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		6
		17

Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Elective		9
		18

NOTE: The following courses are suggested electives:

Business Administration 308 Law of Private Corporations	(3-0)	3
Business Administration 316 Office Management	(2-0)	2
Business Administration 320 Life Insurance	(3-0)	3
Business Administration 322 Property Insurance	(3-0)	3
Business Administration 327 Intermediate Accounting	(3-3)	4
Business Administration 328 Intermediate Accounting	(3-3)	4
Business Administration 329 Cost Accounting	(3-0)	3
Business Administration 344 Marketing Problems	(3-0)	3
Business Administration 427 Insurance Law	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Business Administration 433 Business Management	(3-0)	3
Business Administration 436 Sales Management	(3-0)	3
Economics 318 Economics of Labor	(3-0)	3
Economics 412 Public Finance	(3-0)	3
Economics 422 Monetary Problems and Policies	(3-0)	3
Economics 424 Economics of Transportation	(3-0)	3
English 371 Great Books	(3-0)	3
Geography 204 Economic Geography	(3-0)	3

For a Major in INSURANCE

(Group 5)

The insurance industry is seeking an increasing number of college graduates for positions as agents, agency managers, underwriters, claim adjusters, payroll auditors, safety engineers, and executives. The insurance field includes life, property, and casualty insurance, and corporate suretyship. The curriculum in insurance is designed to provide the specialized training for students who plan to enter this field, whether on their own account, with insurance companies, or with business or industrial concerns.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 205 Marketing	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4
Economics 203 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Military or Air Science	(0-3)	1
Psychology 303 Psychology for Technical Students	(3-0)	3
Elective		1
Physical Education 201	(0-2)	R
		17

Second Semester		Credit
Business Administration 228 Principles of Accounting	(3-3)	4
Business Administration 315 Insurance	(3-0)	3
Economics 204 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		4
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

First Semester		Credit
Business Administration 303 Statistical Method	(3-3)	4
Business Administration 305 Business Law	(3-0)	3
Business Administration 322 Property Insurance	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
Elective		3
		16

Second Semester		Credit
Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 306 Business Law	(3-0)	3
Business Administration 320 Life Insurance	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Elective		6
		18

SENIOR YEAR

Business Administration 324 Casualty Insurance and Suretyship Or	(3-0)	
Business Administration 437 Applied Life Insurance	(3-0)	3
Business Administration 418 Corporation Finance	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Business Administration 440 Real Estate Fundamentals	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		3
		17

Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 427 Insurance Law	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		6
		18

NOTE: The following courses are suggested electives:

Business Administration 208 Advertising	(3-0)	3
Business Administration 308 Law of Private Corporations	(3-0)	3
Business Administration 310 Credits and Collections	(2-0)	2
Business Administration 312 Statistical Charts and Graphs	(1-3)	2
Business Administration 316 Office Management	(2-0)	2
Business Administration 327 Intermediate Accounting	(3-3)	4
Business Administration 329 Cost Accounting	(3-0)	3
Business Administration 403 Income Tax	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Business Administration 436 Sales Management	(3-0)	3
Business Administration 442 Real Estate Practice	(3-0)	3
Industrial Engineering 401 Survey of Industrial Engineering	(3-0)	3

For a Major in MARKETING

(Group 6)

The field of marketing is diversified in the scope of its opportunities. Typical of the fields in which expansion is taking place is retail merchandising. Its major departments include store management, buying, publicity, merchandise planning, research, and personnel work. Market research will make increased demands upon those able to furnish management with the data necessary to keep abreast of marketing changes, to eliminate wasteful marketing methods, and to develop new products. The field of sales administration requires an ever-increasing number of individuals qualified to recruit, select, and train selling personnel. Also in this area lie the important

functions of establishing sales territories, setting sales quotas, and sales costing. Personal selling is a field offering many opportunities for employment. In the field of advertising there is a need for copywriters, space buyers, research workers, media analysts, account executives, and advertising production managers.

By careful selection of electives, a student can specialize in one of the different fields of marketing or gain general knowledge in anticipation of starting his own business.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
Business Administration 205 Marketing	(3-0)	3	**Business Administration 208** Advertising	(3-0)	3
Business Administration 227 Principles of Accounting	(3-3)	4	**Business Administration 228** Principles of Accounting	(3-3)	4
Economics 203 Principles of Economics	(3-0)	3	**Business Administration 303** Statistical Method	(3-3)	4
English 203 Composition and Literature	(2-0)	2	**Economics 204** Principles of Economics	(3-0)	3
Geography 204 Economic Geography	(3-0)	3	**English 210** Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1	**Military or Air Science**	(0-3)	1
Physical Education 201	(0-2)	R	**Physical Education 202**	(0-2)	R
		16			17

JUNIOR YEAR

Business Administration 206 Purchasing and Control of Materials	(2-0)	2	**Business Administration 304** Business Cycles and Business Measurements	(3-0)	3
Business Administration 305 Business Law	(3-0)	3	**Business Administration 306** Business Law	(3-0)	3
Business Administration 325 Retailing	(3-0)	3	**Business Administration 315** Insurance	(3-0)	3
Economics 311 Money and Banking	(3-0)	3	**Psychology 303** Psychology for Technical Students	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3	**Elective**		6
Elective		4			18
		18			

SENIOR YEAR

Business Administration 418 Corporation Finance	(3-0)	3	**Business Administration 344** Marketing Problems	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3	**Business Administration 436** Sales Management	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2	**Business Administration 446** Marketing Industrial Products	(2-0)	2
History 306 American National Government	(3-0)	3	**Elective**		9
Elective		6			17
		17			

NOTE: Six hours of electives are to be selected from the following:

Business Administration 310 Credits and Collections	(2-0)	2	**Business Administration 456** Applied Salesmanship	(0-2)	1
Business Administration 318 Wholesale Merchandising	(3-0)	3	**Journalism 205** Principles of Typography	(2-2)	3
Business Administration 447 Advertising Procedures	(3-0)	3			

For a Major in PERSONNEL ADMINISTRATION (Group 7)

The curriculum in personnel administration provides training for employment in the personnel departments of industrial concerns, public institutions, and governmental agencies, especially those agencies concerned with employer — employee relations. In recent years employer — employee relations have become a major problem of business and society, with the result that there is an increasing demand for qualified college graduates to work in this important field.

FRESHMAN YEAR

(See page 143)

SOPHOMORE YEAR

First Semester		Credit
Business Administration 227 Principles of Accounting	(3-3)	4
Business Administration 315 Insurance	(3-0)	3
Economics 203 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Military or Air Science	(0-3)	1
Psychology 303 Psychology for Technical Students	(3-0)	3
Physical Education 201	(0-2)	R
		16

Second Semester		Credit
Business Administration 228 Principles of Accounting	(3-3)	4
Business Administration 305 Business Law	(3-0)	3
Business Administration 316 Office Management	(2-0)	2
Economics 204 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Military or Air Science	(0-3)	1
Elective		2
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Business Administration 303 Statistical Method	(3-3)	4
Business Administration 306 Business Law	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		5
		18

Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 418 Corporation Finance	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Economics 318 Economics of Labor	(3-0)	3
Elective		6
		18

SENIOR YEAR

Business Administration 423 Personnel Policies and Techniques	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Economics 435 Collective Bargaining and Labor Disputes	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Journalism 321 Industrial Journalism	(2-2)	3
Elective		3
		17

Economics 437 Government and Labor Relations	(2-0)	2
Industrial Education 328 Industrial Accident Prevention	(3-0)	3
Psychology 401 Industrial Psychology	(3-0)	3
Elective		9
		17

NOTE: The following courses are suggested electives:

Business Administration 205 .....(3-0) 3
Marketing
Business Administration 208 .....(3-0) 3
Advertising
Business Administration 320 .....(3-0) 3
Life Insurance
Business Administration 322 .....(3-0) 3
Property Insurance
Business Administration 420 .....(3-0) 3
Principles of Investment
Business Administration 433 .....(3-0) 3
Business Management
Business Administration 436 .....(3-0) 3
Sales Management
Business Administration 463 .....(2-0) 2
Employee Supervision
Economics 319 .....(3-0) 3
Economic Development of the United States
English 405 .....(2-0) 2
Radio Speaking and Studio Practice
Industrial Education 406 .....(2-0) 2
Vocational Guidance
Industrial Engineering 401 .....(3-0) 3
Survey of Industrial Engineering

PREPARATION FOR TEACHING

Two departments in the School of Arts and Sciences provide programs of study which prepare students for certification as teachers in secondary schools. In the Department of Education and Psychology a student may prepare himself for teaching one of the usual secondary school subject matter fields. In the Department of Physical Education a student may prepare himself for coaching athletics and teaching physical education in the secondary school. Normally the student will follow a program leading to the Bachelor of Science degree, but an alternative program is available to the student who desires to obtain a Bachelor of Arts degree. The Department of Education and Psychology also offers teachers, principals, supervisors, and administrators an opportunity to add to their professional preparation in advanced undergraduate and graduate courses.

The Placement Office of the College, with the special cooperation of the School of Arts and Sciences, endeavors to assist graduates and students of the College in securing suitable teaching positions and to assist boards of education and other officials in securing teachers. While no one is assured of a position, every reasonable effort will be made to place all worthy candidates registered for this service. Information obtained from professors and others is confidential. No charge is made for this service.

EDUCATION

The Bachelor's degree is granted students majoring in the Department of Education and Psychology who complete (1) the course requirements in professional education, (2) at least 24 semester hours in a teaching major, and (3) 12 to 18 semester hours in a teaching minor.

Curriculum in EDUCATION

FRESHMAN YEAR

First Semester		Credit	Second Semester		Credit
Biology 101	(2-3)	3	Biology 107	(2-3)	3
General Botany of Seed Plants			Vertebrate Zoology		
*Chemistry 101	(3-3)	4	*Chemistry 102	(3-3)	4
General Chemistry			General Chemistry		
English 103	(3-0)	3	English 104	(3-0)	3
Composition and Rhetoric			Composition and Rhetoric		
History 105	(3-0)	3	History 106	(3-0)	3
History of the United States			History of the United States		
Mathematics 102	(3-0)	3	Mathematics 103	(3-0)	3
Algebra			Plane Trigonometry		
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R	Elective		1
		17	Physical Education 102	(0-2)	R
					18

SOPHOMORE YEAR

Economics 203	(3-0)	3	Economics 204	(3-0)	3
Principles of Economics			Principles of Economics		
Education 121	(3-0)	3	English 231 or 232	(3-0)	3
An Introduction to Education			Survey of English Literature		
English 212	(3-0)	3	Military or Air Science	(0-3)	1
Shakespeare			Physics 202	(3-3)	4
Military or Air Science	(0-3)	1	College Physics		
Physics 201	(3-3)	4	Psychology 207	(3-0)	3
College Physics			General Psychology		
Elective		3	Elective		3
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			17

JUNIOR YEAR

History 306	(3-0)	3	Education 321	(3-0)	3
American National Government			Secondary School Methods		
Physical Education 213	(2-0)	2	Education 322	(3-0)	3
Introduction to Physical Education			Secondary School Administration		
Psychology 301	(3-0)	3	History 307	(3-0)	3
Educational Psychology			State and Local Government		
Elective		10	Elective		9
		18			18

SENIOR YEAR

Education 426	(3-0)	3	Education 425	(2-12)	6
Tests and Measurements			Supervised Student Teaching		
Education 431	(3-0)	3	Education 427	(3-0)	3
An Introductory Course in Techniques of Curriculum Construction			Principles of Guidance		
			**English 403	(1-2)	2
			Speaking for Professional Men		
English 301	(3-0)	3	Elective		3
Writing for Professional Men					14
Physical Education 415	(3-0)	3			
Secondary School Health Education					
Elective		6			
		18			

*A student who desires a Bachelor of Arts degree in education will schedule 12 hours of modern language in the freshman and sophomore years, omitting Chemistry 101, 102 in the freshman year.

**Students with a teaching major in English will substitute English 407.

TEACHING MAJORS AND MINORS

An essential part of this teacher education program is a teaching major of not less than 24 hours, and a teaching minor of 12 to 18 hours related to the teaching major. The combinations and course requirements listed below are defined with considerable exactness and are based upon a careful study of teaching requirements in Texas. Certain teaching majors require specific teaching minors, while others permit selection within limits. Students who wish to depart from the recommended combination or program of courses may do so only with the consent of the Head of the Department of Education and Psychology and the approval of the Dean of Arts and Sciences.

Recommended Teaching Combinations

TEACHING MAJORS (24 hours minimum)	RELATED TEACHING MINORS (12 to 18 hours in one)
Biology	Chemistry, physics, mathematics, economics, history, geography, sociology
Chemistry	Physics, biology, mathematics
Business Administration	Economics, English, mathematics
Economics	Business administration, history, geography, sociology
English	History, economics, geography, journalism, sociology, French, German, Spanish
Geography	History, economics, sociology, English, biology, physics, chemistry, mathematics
History	English, economics, geography, sociology, mathematics, biology, French, German, Spanish
Journalism	English, history, sociology, geography
Mathematics	Physics, chemistry, history, economics, geography, sociology, biology, French, German, Spanish

Course Requirements for Teaching Majors and Minors

Biology
- Teaching Major: Biology 101, 107, 108, 206, 219, 220, 327; Genetics 301.
- Teaching Minor: Biology 101, 107, 108, 327.

Chemistry
- Teaching Major: Chemistry 101, 102, 205, 216, 301, 302.
- Teaching Minor: Chemistry 101, 102, 205, 216.

Business Administration
- Teaching Major: Business Administration 208, 227, 228, 305, 327; Economics 311.
- Teaching Minor: Business Administration 208, 227, 228, 327.

Economics
Teaching Major: Economics 203, 204, 319, 320, 324, 421.
Teaching Minor: Economics 203, 204, 319, 320.

English
Teaching Major: English 103, 104, 212, 231 or 232, 301, 309, 310, 375, 403, 405.
Teaching Minor: English 103, 104, 212, 231 or 232, 301.

Geography
Teaching Major: Geography 203, 204, 301, 302, 303, 308, 401; Geology 205.
Teaching Minor: Geography 203, 204, 308; Geology 205.

History
Teaching Major: History 105, 106, 217, 218, 306, 307, 423, 424.
Teaching Minor: History 105, 106, 217, 218, 306, 307.

Journalism
Teaching Major: Journalism 201, 202, 205, 304, 307, 308, 409, 412; Physics 315.
Teaching Minor: Journalism 201, 202, 304, 307, 409; Physics 315.

Mathematics
Teaching Major: Mathematics 102, 103, 104, 209, 210, 307 or 308; Engineering Drawing 106; Civil Engineering 206.
Teaching Minor: Mathematics 102, 103, 104, 209, 210; Engineering Drawing 106.

Modern Languages
Teaching Minor Only: 12 hours introductory and freshman courses, 12 hours of sophomore and junior level courses.

Physics
Teaching Minor Only: Physics 201, 202, 310, 314, 315.

PHYSICAL EDUCATION

The Bachelor's degree is granted students majoring in the Department of Physical Education who complete the prescribed program of studies in professional education, physical education, and general education, and establish a teaching minor in one of the usual secondary school subject matter fields (See above). The choice of a teaching minor may be made only with the approval of the Head of the Department of Physical Education.

Curriculum in PHYSICAL EDUCATION

FRESHMAN YEAR

First Semester		Credit
Biology 101	(2-3)	3
General Botany of Seed Plants		
English 103	(3-0)	3
Composition and Rhetoric		
History 105	(3-0)	3
History of the United States		
Mathematics 101	(3-0)	3
Algebra		
Military or Air Science	(0-3)	1
Rural Sociology 205	(3-0)	3
Principles of Sociology		
Physical Education 101	(0-2)	R
		16

Second Semester		Credit
Biology 107	(2-3)	3
Vertebrate Zoology		
Chemistry 106	(3-3)	4
General Chemistry		
Education 121	(3-0)	3
An Introduction to Education		
English 104	(3-0)	3
Composition and Rhetoric		
History 106	(3-0)	3
History of the United States		
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

Biology 219	(2-3)	3
Anatomy and Physiology		
Biology 225	(2-0)	2
Personal and Public Health		
English 212	(3-0)	3
Shakespeare		
Military or Air Science	(0-3)	1
Physical Education 211	(1-3)	2
Physical Education Activities		
Physical Education 213	(2-0)	2
Introduction to Physical Education		
Physical Education 221	(2-0)	2
Safety Education		
Elective		2
Physical Education 201	(0-2)	R
		17

Biology 220	(2-3)	3
Physiology and Hygiene		
Economics 205	(3-0)	3
Principles of Economics		
English 231 or 232	(3-0)	3
Survey of English Literature		
Military or Air Science	(0-3)	1
Physical Education 216	(0-3)	1
First Aid		
Physical Education 226	(2-0)	2
Introduction to Recreation		
Elective		4
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Education 321	(3-0)	3
Secondary School Methods		
Physical Education 316	(2-3)	3
Secondary School Physical Education		
Physical Education 415	(3-0)	3
Secondary School Health Education		
Psychology 301	(3-0)	3
Educational Psychology		
Elective		6
		18

Education 322	(3-0)	3
Secondary School Administration		
English 301	(3-0)	3
Writing for Professional Men		
History 306	(3-0)	3
American National Government		
Physical Education 218	(1-3)	2
Athletic Injuries		
Physical Education 325	(2-0)	2
Outdoor Activities		
Elective		5
		18

SENIOR YEAR

First Semester		Credit
English 403 Speaking for Professional Men	(1-2)	2
History 307 State and Local Government	(3-0)	3
Physical Education 423 Administration of Health and Physical Education	(3-0)	3
Psychology 323 Psychology of Adolescence	(3-0)	3
Elective		7
		18

Second Semester		Credit
Education 427 Principles of Guidance	(3-0)	3
Physical Education 425 Tests and Measurements	(3-0)	3
Physical Education 450 Directed Teaching	(2-12)	6
Elective		3
		15

NOTES: 1. Students having completed English 212 may substitute one of the following for English 231 or 232: English 321, 322, 336, 340, 350, or 371.

2. Students taking advanced military or air science will register for History 305 in lieu of History 306 and 307.

SCIENCE

Science programs in the School of Arts and Sciences are administered by the following departments: Biology, Chemistry, Oceanography, and Physics.

The several curricula in science are planned for those students whose interests and abilities lie in the direction of seeking scientific truths and relations previously unknown or not understood in the world about us and of bringing these truths to bear on problems affecting the well-being of mankind. Because many students do not discover the nature of their interests or abilities until they have followed a curriculum in agriculture or engineering for a year or more, the curricula in science are so arranged that a student may change to science with a minimum of loss in semester hour credit.

The curricula are designed to serve the following purposes:

1. To prepare students for research in basic science, usually after further study at the graduate level.
2. To prepare teachers of science in secondary schools and other institutions of learning.
3. To provide the necessary undergraduate foundation for students planning to study medicine or kindred fields.
4. To afford a broad scientific training for students who desire it before entering some field of applied science in industry or government service.

Curricula in BIOLOGICAL SCIENCES

(For Majors in Bacteriology, Botany, Entomology, and Zoology)

FRESHMAN YEAR

First Semester		Credit
Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
History 105 History of the United States	(3-0)	3
Mathematics 101 or 102 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
History 106 History of the United States	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		18

For a Major in BACTERIOLOGY

FRESHMAN YEAR

(See above)

SOPHOMORE YEAR

Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 205 Qualitative Analysis	(2-6)	4
English 203 Composition and Literature	(2-0)	2
Mathematics 104 Analytics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Physical Education 201	(0-2)	R
		17

Biology 206 Introductory Bacteriology	(2-4)	3
Chemistry 216 Quantitative Analysis	(2-6)	4
Economics 205 Principles of Economics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Elective		2
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

Biology 353 Mycology	(2-3)	3
Chemistry 301 Organic Chemistry	(3-3)	4
Dairy Husbandry 320 Bacteriology of Dairy Products	(3-3)	4
English 210 Writing and Discussion	(2-0)	2
Modern Language French or German	(3-0)	3
Elective		1
		17

Biology 224 General Microbiology	(3-3)	4
Chemistry 302 Organic Chemistry	(3-3)	4
Dairy Husbandry 326 Food Preservation and Decomposition	(3-3)	4
Modern Language French or German	(3-0)	3
Elective		2
		17

SENIOR YEAR

First Semester	Credit	Second Semester	Credit
Biochemistry and Nutrition 312 (3-6)	5	**Agronomy 443** (2-3)	3
Veterinary Physiological Chemistry		Soil Microbiology	
Biology 323 (1-6)	3	**Biology 420** (1-0)	1
Systematic Bacteriology		Seminar in Biology	
Biology 455 (3-3)	4	**History 306** (3-0)	3
Pathogenic Microbiology		American National Government	
Modern Language (3-0)	3	**Modern Language** (3-0)	3
French or German		French or German	
Elective	2	**Veterinary Bacteriology and Hygiene 437** (2-4)	3
		Virology	
		Elective	4
	17		17

For a Major in BOTANY

FRESHMAN YEAR

(See page 159)

SOPHOMORE YEAR

Biology 101 (2-3)	3	**Biology 102** (2-3)	3
General Botany of Seed Plants		Taxonomy of Flowering Plants	
Chemistry 205 (2-6)	4	**Biology 327** (2-3)	3
Qualitative Analysis		Fundamental Plant Morphology	
English 203 (2-0)	2	**Chemistry 216** (2-6)	4
Composition and Literature		Quantitative Analysis	
Mathematics 104 (3-0)	3	**English 210** (2-0)	2
Analytics		Writing and Discussion	
Military or Air Science (0-3)	1	**Military or Air Science** (0-3)	1
Physics 201 (3-3)	4	**Physics 202** (3-3)	4
College Physics		College Physics	
Physical Education 201 (0-2)	R	**Physical Education 202** (0-2)	R
	17		17

JUNIOR YEAR

Biology 206 (2-4)	3	**Chemistry 302** (3-3)	4
Introductory Bacteriology		Organic Chemistry	
Chemistry 301 (3-3)	4	**Genetics 301** (3-2)	4
Organic Chemistry		Genetics	
Geography 203 (3-3)	4	**Modern Language** (3-0)	3
Physical Geography		French or German	
Modern Language (3-0)	3	**Plant Physiology and Pathology 313** (2-3)	3
French or German		Introduction to Plant Physiology	
Elective	3	**Elective**	3
	17		17

SENIOR YEAR

Biology 419 (1-0)	1	**Biology 420** (1-0)	1
Seminar in Biology		Seminar in Biology	
Biology 453 (2-3)	3	**Biology (Botany elective)**	3
Plant Anatomy		**English 403** (1-2)	2
Economics 403 (3-0)	3	Speaking for Professional Men	
Principles of Economics		**Genetics 406** (2-3)	3
History 306 (3-0)	3	Biometry—Experimental Technique	
American National Government		**Modern Language** (3-0)	3
Modern Language (3-0)	3	French or German	
French or German		**Elective**	5
Elective	4		
	17		17

For a Major in ENTOMOLOGY

FRESHMAN YEAR

(See page 159)

SOPHOMORE YEAR

First Semester	Credit	Second Semester	Credit
Biology 101 (2-3) General Botany of Seed Plants	3	**Biology 102** (2-3) Taxonomy of Flowering Plants	3
English 212 (3-0) Shakespeare	3	**Biology 206** (2-4) Introductory Bacteriology	3
Entomology 305 (2-3) Insect Morphology	3	**English 231 or 232** (3-0) Survey of English Literature	3
Military or Air Science (0-3)	1	**Military or Air Science** (0-3)	1
Modern Language (3-0) French or German	3	**Modern Language** (3-0) French or German	3
Physics 201 (3-3) College Physics	4	**Physics 202** (3-3) College Physics	4
Physical Education 201 (0-2)	R	**Physical Education 202** (0-2)	R
	17		17

JUNIOR YEAR

Chemistry 301 (3-3) Organic Chemistry	4	**Chemistry 302** (3-3) Organic Chemistry	4
Entomology 301 (2-3) Systematic Entomology	3	**English 301** (3-0) Writing for Professional Men	3
Genetics 301 (3-2) Genetics	4	**Entomology 302** (2-3) Systematic Entomology	3
Modern Language (3-0) French or German	3	**History 306** (3-0) American National Government	3
Elective	2	**Modern Language** (3-0) French or German	3
	16	**Elective**	2
			18

SENIOR YEAR

Biology 433 (3-3) General Physiology	4	**Economics 403** (3-0) Principles of Economics	3
English 403 (1-2) Speaking for Professional Men	2	**Entomology 306** (2-3) Insect Physiology	3
Entomology 401 (2-3) Principles of Insect Control	3	**Entomology 402** (2-3) Agricultural Pests	3
Entomology 423 (2-3) Comparative Anatomy of Arthropods	3	**Entomology 424** (2-3) Insect Ecology	3
Plant Physiology and Pathology 313 (2-3) Introduction to Plant Physiology	3	**Plant Physiology and Pathology 301** (2-3) Plant Pathology	3
Elective	2	**Elective**	2
	17		17

NOTES: 1. See "The Foreign Language Requirement," page 132.

2. Electives in entomology should be selected from the following courses:

Entomology 208 (3-2) Veterinary Entomology	4	**Entomology 308** (2-2) Bees and Pollination	3
Entomology 307 (2-2) Principles of Beekeeping	3	**Entomology 405** (2-3) Fruit and Vegetable Insects	3

3. General electives should usually be selected from the following:

Biology 217 Comparative Anatomy of Vertebrates	(2-4)	3
Biology 218 Comparative Anatomy of Vertebrates	(2-4)	3
Biology 344 Embryology	(2-3)	3
Chemistry 342 Physical Chemistry	(3-3)	4
Genetics 406 Biometry—Experimental Technique	(2-3)	3
Plant Physiology and Pathology 314 Principles of Plant Physiology	(3-3)	4
Wildlife Management 401 General Mammalogy	(2-2)	3
Wildlife Management 403 Ecology of Animals and Plants	(2-3)	3

For a Major in ZOOLOGY

FRESHMAN YEAR

(See page 159)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
Biology 101 General Botany of Seed Plants	(2-3)	3	**Biology 206** Introductory Bacteriology	(2-4)	3
Biology 217 Comparative Anatomy of Vertebrates	(2-4)	3	**Biology 218** Comparative Anatomy of Vertebrates	(2-4)	3
English 212 Shakespeare	(3-0)	3	**English 231 or 232** Survey of English Literature	(3-0)	3
Military or Air Science	(0-3)	1	**Military or Air Science**	(0-3)	1
Modern Language French or German	(3-0)	3	**Modern Language** French or German	(3-0)	3
Physics 201 College Physics	(3-3)	4	**Physics 202** College Physics	(3-3)	4
Physical Education 201	(0-2)	R	**Physical Education 202**	(0-2)	R
		17			17

JUNIOR YEAR

Biology (Zoology elective)		3	**Biology (Zoology elective)**		3
Chemistry 301 Organic Chemistry	(3-3)	4	**Chemistry 302** Organic Chemistry	(3-3)	4
Genetics 301 Genetics	(3-2)	4	**History 306** American National Government	(3-0)	3
Modern Language French or German	(3-0)	3	**Modern Language** French or German	(3-0)	3
Elective		3	**Elective**		4
		17			17

SENIOR YEAR

Biology 419 Seminar in Biology	(1-0)	1	**Biology 420** Seminar in Biology	(1-0)	1
Biology (Zoology elective)		4	**Biology (Zoology elective)**		4
Economics 403 Principles of Economics	(3-0)	3	**Elective**		12
English 403 Speaking for Professional Men	(1-2)	2			17
Elective		7			
		17			

NOTES: 1. See "The Foreign Language Requirement," page 132.

2. The elective hours in zoology must include 12 hours chosen from the following courses: Biology 343, 344, 422, 433, 434, 435, 436.

3. Elective hours and the remaining hours required for the major should be selected from the following:

*Architecture 205 Freehand Drawing	(0-3)	1
Architecture 206 Freehand Drawing	(0-3)	1
*Chemistry 216 Quantitative Analysis	(2-6)	4
*Chemistry 301 Organic Chemistry	(3-3)	4
*Chemistry 302 Organic Chemistry	(3-3)	4
Chemistry 342 Physical Chemistry	(3-3)	4
Chemistry 443 Animal Biochemistry	(3-3)	4
Chemistry 444 Animal Biochemistry	(3-3)	4
Civil Engineering 406 Sanitation and Public Health	(3-0)	3
Entomology 201 General Entomology	(2-2)	3
Entomology 208 Veterinary Entomology	(3-2)	4
Entomology 301 Systematic Entomology	(2-3)	3
Entomology 302 Systematic Entomology	(2-3)	3
Entomology 305 Insect Morphology	(2-3)	3
Entomology 306 Insect Physiology	(2-3)	3
Entomology 312 Medical Entomology	(3-2)	4
*Genetics 301 Genetics	(3-2)	4
Genetics 304 Plant Breeding	(3-2)	4
Genetics 306 Animal Breeding	(2-2)	3
Genetics 406 Biometry—Experimental Technique	(2-3)	3
Geology 205 Elementary Geology	(3-3)	4
Wildlife Management 201 Wildlife Conservation and Management	(3-0)	3
Wildlife Management 401 General Mammalogy	(2-2)	3
Wildlife Management 402 General Ornithology	(2-2)	3
Wildlife Management 403 Ecology of Animals and Plants	(2-3)	3

Studies Preparatory to
MEDICINE, DENTISTRY, AND RELATED FIELDS

Premedical and Predental Program

Students planning to enter a school of medicine or dentistry without first taking a college degree should matriculate in the curriculum in science and take the following program:

FRESHMAN YEAR

First Semester		Credit
Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language French or German	(3-0)	3
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language French or German	(3-0)	3
Elective		1
Physical Education 102	(0-2)	R
		18

*Strongly recommended for all zoology majors.

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
Biology 217 Comparative Anatomy of Vertebrates	(2-4)	3	**Biology 218** Comparative Anatomy of Vertebrates	(2-4)	3
Chemistry 216 Quantitative Analysis	(2-6)	4	**Chemistry 301** Organic Chemistry	(3-3)	4
English 212 Shakespeare	(3-0)	3	**English 231 or 232** Survey of English Literature	(3-0)	3
Military or Air Science	(0-3)	1	**Military or Air Science**	(0-3)	1
Modern Language French or German	(3-0)	3	**Modern Language** French or German	(3-0)	3
Physics 201 College Physics	(3-3)	4	**Physics 202** College Physics	(3-3)	4
Elective		1	**Elective**		1
Physical Education 201	(0-2)	R	**Physical Education 202**	(0-2)	R
		19			19

JUNIOR YEAR

Architecture 205 Freehand Drawing	(0-3)	1	**Architecture 206** Freehand Drawing	(0-3)	1
Biology (elective)		3	**Biology (elective)**		3
Chemistry 302 Organic Chemistry	(3-3)	4	**Chemistry 342** Physical Chemistry	(3-3)	4
Economics 403 Principles of Economics	(3-0)	3	**English 401** Public Speaking	(0-2)	1
History 105 History of the United States	(3-0)	3	**History 106** History of the United States	(3-0)	3
Psychology 207 General Psychology	(3-0)	3	**History 306** American National Government	(3-0)	3
Elective		1	**Elective**		3
		18			18

NOTES: 1. Under the regulations imposed by the American Medical Association, a medical school may admit students who have as little as two years of premedical training. But ninety per cent of the students admitted to medical and dental schools in the United States have three or more years of premedical training. A large proportion hold college degrees in science or liberal arts. It is therefore recommended that students preparing to enter medical or dental school plan at the outset to complete at least the foregoing three-year program. (The Medical Branch of the University of Texas, the Baylor University College of Medicine, and the Southwestern College of Medicine require a minimum of three years of college work for admission. At present Baylor University College of Dentistry and the School of Dentistry of the University of Texas are likewise requiring three years of college work for admission.)

2. Students who complete this three-year program and later the first two years in medicine at a Class A medical school will be awarded the Bachelor of Science degree upon transferring their medical credits to the Agricultural and Mechanical College of Texas, provided the grade point requirement has been met.

3. Since courses in literature, language, history, and social sciences are not offered in medical or dental schools, leaders in medical education urge prospective medical and dental students to include much of such work in their preprofessional education. Available electives for the junior and senior years in line with this recommendation are:

Business Administration 227 Principles of Accounting	(3-3)	4	**Rural Sociology 205** Principles of Sociology	(3-0)	3
Business Administration 228 Principles of Accounting	(3-3)	4	**Rural Sociology 206** Principles of Sociology	(3-0)	3
English 203 Composition and Literature	(2-0)	2	**Rural Sociology 311** Social Psychology	(3-0)	3
English 210 Writing and Discussion	(2-0)	2			

Economics courses, literature courses, history courses, foreign language work in advance of degree requirements, and military or air science courses are also recommended. Available electives in the sciences related to medicine are:

Biology 206 Introductory Bacteriology	(2-4)	3
Biology 323 Systematic Bacteriology	(1-6)	3
Biology 343 Histology	(1-6)	3
Biology 344 Embryology	(2-3)	3
Biology 419 Seminar in Biology	(1-0)	1
Biology 420 Seminar in Biology	(1-0)	1
Biology 422 Microtechnique	(1-6)	3
Biology 433 General Physiology	(3-3)	4
Biology 434 General Mammalian Physiology	(2-3)	3
Biology 435 Advanced Invertebrate Zoology	(3-3)	4
Biology 436 Animal Parasitology	(3-3)	4
Civil Engineering 406 Sanitation and Public Health	(3-0)	3
Entomology 312 Medical Entomology	(3-2)	4
Genetics 301 Genetics	(3-2)	4

Curricula in the PHYSICAL SCIENCES

(For Majors in Chemistry, the Meteorology Option in Oceanography, and Physics)

FRESHMAN YEAR

First Semester		Credit
Biology 101 General Botany of Seed Plants	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 104 Analytics	(3-0)	3
Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1
Elective		2
Physical Education 102	(0-2)	R
		17

For a Major in CHEMISTRY

FRESHMAN YEAR

(See above)

SOPHOMORE YEAR

Chemistry 205 Qualitative Analysis	(2-6)	4
English 203 Composition and Literature	(2-0)	2
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language[1] French or German	(3-0)	3
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		18

Chemistry 216 Quantitative Analysis	(2-6)	4
Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language[1] French or German	(3-0)	3
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		16

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Chemistry 301	(3-3)	4	Chemistry 302	(3-3)	4
Organic Chemistry			Organic Chemistry		
Chemistry 323	(3-3)	4	Chemistry 324	(3-3)	4
Physical Chemistry			Physical Chemistry		
Mathematics 308	(3-0)	3	Chemistry 447	(1-6)	3
Differential Equations			Qualitative Organic Analysis		
Modern Language[1]	(3-0)	3	English 210	(2-0)	2
French or German			Writing and Discussion		
Elective		3	Modern Language[1]	(3-0)	3
		17	French or German		
			Elective		2
					18

SENIOR YEAR

Chemistry 400	(1-6)	3	Chemistry 448	(2-3)	3
Industrial Analysis			Electrochemistry		
Chemistry 454	(1-0)	1	Chemistry (elective)		4
Seminar			Economics 403	(3-0)	3
Chemistry (elective)		4	Principles of Economics		
English 301	(3-0)	3	English 403	(1-2)	2
Writing for Professional Men			Speaking for Professional Men		
History 306	(3-0)	3	Elective		5
American National Government					17
Elective		3			
		17			

NOTES: 1. See "The Foreign Language Requirement," page 132.

2. Chemistry electives in the senior year must be selected from the following courses:

Chemistry 443	(3-3)	4	Chemistry 449	(4-0)	4
Animal Biochemistry			Energetics		
Chemistry 444	(3-3)	4	Chemistry 450	(3-3)	4
Animal Biochemistry			Colloidal Chemistry		
Chemistry 445	(3-3)	4	Chemistry 452	(3-3)	4
Plant Biochemistry			Inorganic Chemistry		
Chemistry 446	(3-3)	4	Chemistry 455	(4-0)	4
Plant Biochemistry			Paints and Coatings		

For a Major in OCEANOGRAPHY

(Meteorology Option)

Meteorology is the science of the atmosphere and all the phenomena occurring within it. One of the so-called "earth sciences," it concerns itself with the weather (the condition and activity of the atmosphere at a given time) and with the climate (the average weather over a period of time). The objective of meteorology is to determine the physical laws governing weather and climate and to apply these in weather forecasting and in other ways benefiting human life and endeavor.

The greatest uses for weather information and forecasts at the present time are to satisfy specific needs in aviation and to provide general information for the public. Increasing rewards are being found in the applications of weather knowledge to agriculture, shipping, engineering, civil and industrial planning, health and travel, recreation, and related sciences.

The undergraduate program in the meteorology option given below comprises the equivalent in approach and content of the training required for the Bachelor of Science degree in meteorology at leading institutions in the country. The student who completes this program may continue his studies in meteorological oceanography, or in graduate meteorology, and is also prepared for most professional work with various private and public weather agencies, including the weather bureau.

FRESHMAN YEAR

(See page 165)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
English 203 Composition and Literature	(2-0)	2	English 210 Writing and Discussion	(2-0)	2
Mathematics 209 Calculus	(3-0)	3	Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Modern Language [1,2] French, German, or Spanish	(3-0)	3	Modern Language [1,2] French, German, or Spanish	(3-0)	3
Physics 203 General Physics	(4-3)	5	Physics 204 General Physics	(4-3)	5
Elective		3	Technical Elective		4
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			18

JUNIOR YEAR

Mathematics 307 Calculus	(3-0)	3	Modern Language [1,2] French, German, or Spanish	(3-0)	3
Modern Language [1,2] French, German, or Spanish	(3-0)	3	Oceanography 318 Meteorological Instruments, Observations, and Communications	(1-3)	2
Oceanography 317 Meteorological Instruments, Observations, and Communications	(2-3)	3	Oceanography 326 Regional Climatology	(2-0)	2
Oceanography 325 Physical Climatology	(3-0)	3	Oceanography 336 Atmospheric Motions	(3-3)	4
Oceanography 335 Atmospheric Statics and Thermodynamics	(3-0)	3	Elective		6
Elective		2			17
		17			

SENIOR YEAR

Economics 403 Principles of Economics	(3-0)	3	English 403 Speaking for Professional Men	(1-2)	2
English 301 Writing for Professional Men	(3-0)	3	History 306 American National Government	(3-0)	3
Oceanography 445 Atmospheric Physical Processes	(3-0)	3	Oceanography 401 Introduction to Oceanography	(3-0)	3
Oceanography 457 Synoptic Weather Analysis	(1-12)	5	Oceanography 458 Weather Analysis	(1-12)	5
Elective		3	Elective		4
		17			17

NOTES: 1. See "The Foreign Language Requirement, page 132.

2. A reading knowledge of German is recommended for graduate work in meteorology and oceanography; reading knowledge of German and another foreign language will be required of all candidates for the Ph.D. degree.

For a Major in PHYSICS

Physics is the science of energy and the interaction of energy and matter. Some physicists are primarily concerned with the discovery and investigation of effects and relations in the physical universe previously unknown or not understood. Others, known as applied physicists, are interested in bringing to the solution of industrial and technical problems, physical effects not previously so applied. When new and better ways are required to obtain and transmit energy or to alter the configuration or constitution of matter, physicists are of service.

Many branches of industry are seeking applied physicists with all levels of professional training from the bachelor's to the doctor's degree. Industrial and government-operated research laboratories and colleges and universities are seeking investigators of new physical truths and relations with professional training beyond the bachelor's degree. College graduates in physics are far short of the number needed.

The undergraduate curriculum in physics offers a thorough coverage of the phenomena of classical, atomic, and nuclear physics, while developing the student's mathematical tools to the point where he can deal resourcefully and constructively with these phenomena. It also provides a grounding in related sciences, linguistic techniques, and general education. Elective time permits further broadening of the student's education or a degree of concentration in some phase of engineering.

FRESHMAN YEAR

(See page 165)

SOPHOMORE YEAR

First Semester		Credit
English 203 Composition and Literature	(2-0)	2
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language[1] French or German	(3-0)	3
Physics 203 General Physics	(4-3)	5
Elective		3
Physical Education 201	(0-2)	R
		17

Second Semester		Credit
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Modern Language[1] French or German	(3-0)	3
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		17

JUNIOR YEAR

First Semester		Credit
Mathematics 308 Differential Equations	(3-0)	3
Modern Language[1] French or German	(3-0)	3
Physics 301 Heat	(3-3)	4
Physics 311 Atomic Physics	(3-0)	3
Elective		3
		16

Second Semester		Credit
Mathematics 307 Calculus	(3-0)	3
Modern Language[1] French or German	(3-0)	3
Physics 302 Mechanical Properties of Matter	(2-3)	3
Physics 312 Elements of Nuclear Physics	(2-0)	2
Physics 401 Optics	(3-3)	4
Elective		3
		18

SENIOR YEAR

English 301 Writing for Professional Men	(3-0)	3
Mathematics 405 Vector Analysis	(3-0)	3
Physics 411 Experimental Modern Physics	(0-6)	2
Physics 413 Electricity and Magnetism	(2-3)	3
Elective		6
		17

English 403 Speaking for Professional Men	(1-2)	2
History 306 American National Government	(3-0)	3
Physics 405 Physical Mechanics	(3-0)	3
Physics 414 Electricity and Magnetism	(1-3)	2
Physics 416 Electromagnetic Fields	(3-0)	3
Elective		5
		18

NOTES: 1. See "The Foreign Language Requirement," page 132.

2. Electives should be selected in consultation with, and on approval of, the Head of the Department with two objectives in view: (1) to strengthen the broad foundation expected of students who specialize in physics; (2) to intensify the student's program in the direction of a specific competence. For objective (1) are recommended electives in other sciences, especially chemistry; electives in basic engineering courses, such as DC and AC machinery, circuit theory, engineering mechanics, mechanics of materials, thermodynamics, engineering drawing (Engineering Drawing 105), and machine shop (Mechanical Engineering 309); and electives in mathematics, the humanities, and social sciences.
Objective (2) is determined by the student's interests and plans for the future. He may aspire to a career of advancing knowledge of fundamental physics through basic research on physical phenomena or through college teaching. In this case the student must plan on postgraduate study and should choose his electives to increase his intellectual equipment in mathematics and to widen his range of acquaintance with subjects in physics and other sciences and fields important for an educated man. If the student is interested in research in physics bearing on a field of some other science, such as chemistry, geology, meteorology, oceanography, or biology, a heavy concentration of electives should be made in the science. The student preparing for a career in high school teaching should elect courses in education and in other sciences. A student planning to go directly into industry upon graduation should concentrate a large portion of his electives in a sequence of courses proceeding to an advanced stage in, for instance, aeronautical engineering, communications and electronics in electrical engineering, or vibrations and the mechanics of materials, or thermodynamics and heat transfer in mechanical engineering.

THE SCHOOL OF ENGINEERING

CURRICULA

FOUR-YEAR CURRICULA

Aeronautical Engineering
*Agricultural Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Geological Engineering
Geology
Industrial Education
Industrial Engineering
Mechanical Engineering
Petroleum Engineering

FIVE-YEAR CURRICULA

Architecture
Chemical Engineering—
General Business
Geology—Petroleum
Engineering
**Industrial Engineering
Petroleum Engineering
Petroleum Engineering—
General Business
Petroleum Engineering—
Chemical Engineering
Petroleum Engineering—
Geological Engineering
Petroleum Engineering—
Mechanical Engineering

COMBINED DEGREE PLANS

The work for the Bachelor of Science degree in any engineering program may be merged in a five-year degree plan with work for the Bachelor of Arts degree in English, thus combining a full professional training in engineering with a general education in the field of liberal arts. (See page 50, "Two Degrees," and page 89, paragraph 2 under "Curricula".)

GENERAL STATEMENT

The courses of study outlined under the various engineering curricula leading to degrees in engineering are planned for those students who expect to enter the engineering profession upon graduation. The curricula include English, public speaking, economics, government, physical training, and military or air science and tactics. Emphasis is placed on studies in mathematics and the physical sciences.

The principal portions of all curricula are devoted to the fundamentals of engineering science and the basic material related to the several fields of endeavor. Practice work and

*Administered jointly by Schools of Agriculture and Engineering.
**A degree of Bachelor of Science in Industrial Engineering may be awarded on the basis of a student's having satisfactorily completed the degree of Bachelor of Science in Aeronautical, Chemical, Civil, Electrical, Mechanical or Petroleum Engineering and additional required courses.

problem courses are provided so that the student may learn more readily the application of these fundamentals to the solution of problems encountered in the practice of engineering.

These courses are professional engineering courses and are not training courses for any of the mechanical or manipulative skills. The curricula are planned to provide preparation for research, design, operation, management, testing, or maintenance of engineering projects. With the exception of architecture, industrial education, and the paleontology and business options in geology, all curricula are the same through the freshman year.

AERONAUTICAL ENGINEERING

The profession of aeronautical engineering includes the technical activities associated with aircraft design, research, manufacture, testing, and maintenance.

Aeronautical engineering graduates are employed as designers and research engineers in airframe manufacturing companies, government research laboratories, and equipment manufacturing companies in Texas and elsewhere. A considerable number enter the military services as engineering officers. Aeronautical engineering graduates are also well qualified for positions in other fields of engineering, since men trained in aerodynamics and the design of high strength, light weight structures are in demand in many industries.

The Aeronautical Engineering Department has excellent facilities in the new Engineering Building on the campus and at the College-owned Easterwood Airport. Facilities on the campus include a supersonic wind tunnel, two small low-speed wind tunnels, a structures laboratory, a materials and process laboratory, an instrument laboratory, and complete shop facilities. The Personal Aircraft Research Center, the large wind tunnel, and the Guiberson Engine Laboratory are located at Easterwood Airport. The airport is one of the best in the Southwest and offers unequaled facilities for flight research.

Undergraduate Program

The four-year undergraduate curriculum in aeronautical engineering leading to the degree of Bachelor of Science, includes sound preparation in mathematics, physics, chemistry, English, and mechanics. The junior and senior years are devoted largely to the professional courses in aerodynamics, air-

craft structures, aircraft power plants, and aircraft design. The opportunity to elect courses in a desired specialty is provided in the senior year.

Advanced Training

In addition to the four-year curriculum leading to the degree of Bachelor of Science, advanced training leading to the Master of Science or Master of Engineering degree is offered. This program includes elective graduate courses and is recommended for the better than average student interested in more extensive training in a desired field.

The normal time required for the completion of the undergraduate and graduate programs is five academic years.

AGRICULTURAL ENGINEERING

See page 99 for a discussion of this curriculum.

ARCHITECTURE

The program in architecture is designed primarily to prepare young men for professional careers in the design and construction of buildings.

The method of teaching is that of individual criticism accompanied by careful direction in the use of the library and in materials of construction. The work of the first two years is designed to give the student fundamental training in the techniques of drafting and an appreciation and understanding of the elementary principles of design and construction. The work of the upper years is built around the larger problems of architecture which, in many instances, become individual student projects.

Two options are offered: I, Design Option; II, Construction Option. The program is the same during the first two years. This makes it possible for the student to defer his decision until the beginning of his junior year, when he can more intelligently select his course of study for his upper years. Both options are five-year courses. Option I leads to the degree of Bachelor of Architecture; Option II, to the degree of Bachelor of Science in Architectural Construction.

While the programs are designed primarily to prepare young men for professional careers in architecture and building construction, the training forms a good foundation for those who may wish to enter other fields. Graduates find

their way into the profession as draftsmen, designers, estimators, superintendents of construction, and develop careers as architects, contractors, and city and regional planners.

The department is a member of the Association of Collegiate Schools of Architecture, is on the approved list of schools accepted by the Texas Board of Architectural Examiners, and is accredited by the National Architectural Accrediting Board.

CHEMICAL ENGINEERING

Chemical engineering is that branch of engineering concerned with the development and application of manufacturing processes in which chemical or certain physical changes of materials are involved. These processes may usually be resolved into a coordinated series of unit physical operations and unit chemical processes. The work of the chemical engineer is concerned primarily with the design, construction, and operation of equipment and plants in which series of these unit operations and processes are applied. Chemistry, physics, and mathematics are the underlying sciences of chemical engineering, and economics is its guide in practice.

Chemical engineering became a separate division of engineering with the growth of strictly chemical industries, and it is now recognized as one of the important divisions of engineering, dealing with combustion of fuels, heat treatment of metals and alloys, the preparation of water for potable and industrial use, the refining of petroleum, processing of vegetable oils, the development of electric furnace products, portland cement, lime gypsum, plaster, heavy chemicals, soaps, rubber, corn products, textiles, paper, artificial leather and silks, food products, and other products.

The work of the chemical engineer is the changing of raw materials into finished products with the greatest efficiency and economy. He substitutes a rigid control of processes for guess work and uncertainty and increases the productivity of labor by supplying more efficient processes where the standard and quality of the finished product are revised and the amount of seconds and rejections is reduced. The chemical engineer must also be able to modify a process in order to adapt it to commercial conditions and to select his material for construction with special reference to its use. His work is distinct from that of the chemist on the one hand and the mechanical engineer on the other, though he must have a thorough training in both chemistry and engineering.

The curriculum in chemical engineering is planned to prepare students for the design, construction, and operation of industries in which materials undergo chemical and physical change. The unit operations, such as fluid flow, heat flow, evaporation, drying, distillation, gas absorption, filtration, crushing and grinding, and size separation are basic studies that may be applied to any industry. General chemical processes are also included in the laboratory and classroom work. Research in both of these divisions is fostered by cooperative projects with the Texas Engineering Experiment Station and industrial organizations of the State.

As chemical engineering treats of the processes whereby materials undergo a chemical and physical change, it is apparent that a large number of diversified industries have use for the chemical engineer, not only in the operation and control of processes but in the design of special equipment. Many chemical engineers enter the research laboratory, investigating processes in the laboratory and supervising their operation in the plants, considering carefully the controlling interest of cost as a factor in all industrial operations.

In addition to the regular four-year course in chemical engineering, it is possible for a student to spend an additional year and receive two degrees. Five-year curricula are available in chemical engineering combined with petroleum engineering or with general business. They lead to a Bachelor of Science degree in both Chemical Engineering and Petroleum Engineering or a Bachelor of Science degree in Chemical Engineering and the degree of Bachelor of Business Administration.

CHEMICAL ENGINEERING—GENERAL BUSINESS

The five-year curriculum in chemical engineering—general business leads to a Bachelor of Science degree in Chemical Engineering and the degree of Bachelor of Business Administration. This curriculum includes all the courses required in the four-year chemical engineering and the four-year general business curricula and will provide the student with an excellent technical background as well as a sound business foundation.

CHEMICAL ENGINEERING— PETROLEUM ENGINEERING

The five-year curriculum in chemical engineering — petroleum engineering leads to a Bachelor of Science degree in both Chemical Engineering and Petroleum Engineering. This

curriculum includes all of the courses required in the four-year chemical engineering and the four-year petroleum engineering curricula and is intended to provide a background so that the graduate may have the necessary fundamentals to engage in the refining, natural gasoline, development, production, or transportation phase of the petroleum industry, or in allied industries which employ similar techniques or materials.

The curriculum is described under the five-year curriculum in petroleum engineering—chemical engineering.

CIVIL ENGINEERING

The curriculum in civil engineering has for its object the thorough grounding of young men in the underlying principles of the basic sciences and engineering. Training or practice in the art of applying these principles to problems encountered in practice is given in the drafting room, laboratories, and in the field so as to enable the graduate to give satisfactory service in an engineering organization immediately upon graduation.

During the first three years the subject matter of the courses is common to all phases of civil engineering, such as surveying, highway engineering, mechanics, strengths of materials, hydraulics, and stress analysis. In the fourth year the student is given an opportunity to specialize moderately in structural engineering, highway engineering, hydraulic engineering, or municipal and sanitary engineering. In addition, courses in cost estimating and construction methods are required of all the students so as to give them an understanding of the importance of these matters in the practice of civil engineering. It is possible for students who are interested in construction engineering to specialize to some extent in that phase of the profession.

The moderate specialization indicated above does not restrict the student to securing employment in a special field. The curriculum is so planned as to make it possible for him to undertake professional practice embracing the following: surveying, water supply; sewerage; the planning, design, and construction of buildings, bridges, earthen dams, resorvoirs, canals, and the conventional types of foundations required for all of the structures; planning, design, construction, and maintenance of roads and highways; planning and execution of sanitary measures for rural and urban communities; administration of city business as city manager; industrial, academic,

and governmental research of civil engineering matters; and technical service of various kinds for industries leading to executive positions.

ELECTRICAL ENGINEERING

The curriculum in electrical engineering is designed to give the student thorough training in the principles of direct and alternating current phenomena and of electronics. It provides training in the subjects fundamental to the general practice of engineering, in the theory of electricity, and in the application of the theory to practical problems in engineering.

The work of the first three years includes courses in mathematics, chemistry, physics, drawing, and mechanics which are common to all branches of engineering. Electrical engineering subjects begin in the sophomore year and continue in increasing amount through the junior and senior years. Much emphasis is put on the fundamental principles of electricity, but the fundamentals are vitalized with illustrations of their application in engineering practice. Opportunity for specialization is offered in the senior year with electives in radio and communication engineering, power machinery, industrial electronics, television, radar, and servo-mechanisms. These courses tend to impress more firmly on the students' minds the principles already covered and to give the student specific information about one or more of the branches of electrical engineering.

Electrical engineering offers broad opportunities for young men with proper training. Graduates in this course may find employment in any of the following fields: construction and operation of generating stations and electric power systems, installation and operation of electrical equipment in industrial plants, manufacture and sale of electrical equipment, geophysical exploration in the petroleum industry, rural electrification and the application of electricity to agriculture, radio communications, television, telephone and telegraph systems, illumination, urban and trunk line transportation systems, development of electrical equipment and controls for aircraft, teaching, and research.

Recently the application of electron tubes to the control of all sorts of processes in industry, as well as in communications and television, has resulted in what is known as the field of electronics. While this field is especially promising and new developments in it are constantly being made, it should be pointed out that it is not something distinct and apart from

electrical engineering, but it is merely the newest of the many fields in which electrical engineers work. The course in electrical engineering prepares its graduates for work in electronics, which includes television, radar, and other recent war developments.

Student branches of the American Institute of Electrical Engineers and of the Institute of Radio Engineers have been organized at the College. These afford a means of keeping students in touch with the latest developments in these fields.

GEOLOGY

Training in geology is designed to prepare the student in the fundamentals of the earth sciences. These include the study of rocks, minerals, fossils, earth structures, the physical features of the earth's surface, and the economic application of this knowledge.

The curriculum is broad, yet it allows the student the choice of a major in geology, geology with a business option, geology with a geophysics option, geology with a paleontology option, or geological engineering. A major in any one of these five curricula leads to the degree of Bachelor of Science in a normal period of four years.

In addition to the four-year curricula, two five-year curricula are available, geology—petroleum engineering and petroleum engineering—geological engineering. The student who completes either of the five-year programs receives two Bachelor of Science degrees.

MAJOR IN GEOLOGY

This curriculum is designed for the student who approaches geology as a science, with the inherent obligation of exploring, observing, analyzing, inquiring, classifying, describing, and finally interpreting the record and the content of the rocks. It is based upon the related sciences of chemistry, physics, mathematics, and biology. It prepares a man either for general geological investigations or for graduate study in geology.

GEOLOGY, BUSINESS OPTION

The curriculum in geology, business option, combines the regular geology courses with twenty-two hours of business courses. It differs from the major in geology in that it does not require calculus, physical chemistry, or modern languages,

and has general physics substituted for engineering physics. Students who expect to do graduate work which has modern language requirements should take additional work in modern languages if they choose this curriculum.

GEOLOGY, GEOPHYSICS OPTION

This curriculum is designed for the student who plans to apply geology to the physical measurement of earth structures, especially to exploration geophysics. The training prepares a man to use geology with an organization that uses seismic, gravimetric, magnetic, electric, or other techniques of geophysical surveying. Emphasis is placed on structural geology, physics, mathematics, and related fundamentals of engineering.

GEOLOGY, PALEONTOLOGY OPTION

This curriculum is designed to give additional training in biology and paleontology. Emphasis is given to micropaleontology in order to prepare the student for work in micropaleontology in the petroleum industry.

GEOLOGY—PETROLEUM ENGINEERING

The five-year geology—petroleum engineering curriculum leads to Bachelor of Science degrees in both geology and petroleum engineering. This curriculum includes the subjects required in the curriculum in geology and in the four-year petroleum engineering curriculum.

GEOLOGICAL ENGINEERING

The curriculum in geological engineering provides training in the fundamental principles of engineering as well as specialized training in geology. Although this course is designed primarily for the student who expects to be employed as a petroleum geologist, the curriculum is such that the graduate is also qualified for work with railroads, public utilities, construction, ceramic, and other industries in which a knowledge of both geology and engineering is desirable.

INDUSTRIAL EDUCATION

The industrial education curriculum under Group 1 aims to prepare young men in the following professional fields:

Teachers of industrial arts subjects in junior, senior, or technical schools. (Industrial arts in these schools include such subjects as general shop, electrical work, metal work, woodwork, technical drawing, plastics, ceramics, leather, and other craft courses.)

Teachers of occupational courses and sponsors of guidance, safety, and personnel programs in public schools.

The industrial education curriculum under Group 2 is intended for teachers, supervisors, and directors for the vocational industrial schools and classes of Texas. Since the men completing this course are to qualify as teachers under the State Plan for Vocational Education, a candidate for a degree must satisfy the requirements for one of the classes of vocational teachers as specified in the State Plan.

In general the industrial technology option under Group 3 prepares young men in the following types of occupations:

Employees in industrial relations department of industries which include such work as employee training employment, personnel, production, and accident prevention.

Students interested in this option will pursue courses during the freshman and sophomore years as outlined for the curriculum in industrial education, Group 1.

INDUSTRIAL ENGINEERING

Surveys have shown that some seventy-five per cent of all engineering graduates are sooner or later employed in fields other than their specialty in college. Many of these engineers who are no longer doing strictly engineering work have moved into executive positions where their background knowledge of engineering principles is invaluable, but where their pressing need is knowledge of the principles of management. As the executive's responsibility grows, it becomes necessary for him to have a working knowledge of accounting principles, including cost accounting, of scientific planning and control of production, of what constitutes an efficiently performed job, of the intricacies of human relations in industry, of personnel problems in general, and of effective administrative technics. These phases and similar phases of managing an enterprise are emphasized in all the curricula of industrial engineering.

Industry is in need of young men who have a technical background which informs them of the nature of the technological forces, who have in addition an adequate knowledge of the details of organizing and operating an enterprise, and who are cognizant of the human and humane elements involved. The curricula in industrial engineering are designed with these needs in mind.

Four-Year Curriculum

The four-year curriculum leading to the degree of Bachelor of Science in Industrial Engineering covers the basic engi-

neering subjects founded on the physical sciences which are common to most engineering curricula. Specialized fields of study in industrial engineering include the principles of organizing and operating an industrial enterprise, of devising efficient methods of production, and of handling personnel. A foundation is laid with the intention of providing substantial aid to young engineers seeking greater responsibilities.

Five-Year Curriculum

Since there is an insistent and growing demand for men versed in the fundamentals of other branches of engineering and also in the fundamentals of executive control, there are offered five-year curricula designed for students who wish training in industrial and in aeronautical, chemical, civil, electrical, mechanical, or petroleum engineering. Thus, in five years the student may complete the requirements for two Bachelor of Science degrees, one in his preferred specialty of engineering and the other in the field of industrial engineering. The completion of the requirements for these two degrees should admirably prepare the engineering graduate for rapid advancement.

Students wishing to obtain the degrees of Bachelor of Science in industrial engineering and Bachelor of Business Administration may do so through the suitable choice of electives in the four-year curriculum in industrial engineering, and by meeting the requirements of at least 36 credit hours of additional work. The program of study will be planned to meet the particular needs in the chosen field of specialization, and must be started not later than the beginning of the junior year. It must be approved by the Heads of the Departments of Business Administration and Industrial Engineering and by the deans concerned. Suggested areas of study are in sales engineering, cost control, personnel administration, and purchasing and materials control.

These curricula are largely the outgrowth of the rapid industrialization of Texas and the Southwest, a process in part due to the tendency toward the decentralization of industry from the older industrial areas and in part due to the economic advantages of Texas. While the opportunities in the industries of Texas are emphasized, graduates are finding employment in all parts of the nation.

INDUSTRIAL MANAGEMENT

Recognizing that there is a growing demand for men who are skilled in the profession of management, this curriculum

is designed for the student who shows an aptitude for managerial work. Admission to the curriculum will be made by selection of outstanding students just before the end of their sophomore year. It is expected that most of the students entering this curriculum will continue with a fifth year of study leading to the Master's degree.

Students taking this curriculum will be expected to gain practical experience by summer employment in industry, and will be aided in obtaining the type of employment related to their course of study. This experience will be supplemented with plant visits to representative industries. It will be noted that this curriculum provides the student with more study in economics, marketing, psychology and safety than does the curriculum in industrial engineering. In the fifth year of study, emphasis will be placed on the study of human relations, manufacturing costs, administrative methods, labor problems, and fiscal policies.

The art of managing a business enterprise cannot be mastered by academic study alone, but the curriculum in industrial management is so constructed that the graduates will be unusually well prepared to understand the problems of management. This understanding will enable them to keep the goal of a position in management as their objective as they progress through advancement in industry.

MECHANICAL ENGINEERING

The breadth of the field of mechanical engineering is such that extensive specialization in undergraduate work is impossible and undesirable. Industry needs mechanical engineers for such a variety of work that it is deemed wise to make the curriculum broad and fundamental.

Training in habits of accurate analysis and logical thinking, the prerequisites of a good engineer, is emphasized.

Fundamental theory courses are supplemented by practice work in pattern shop, foundry, machine shop, welding, and testing. Practice courses are designed to instruct in methods rather than to develop extensive skills.

Some specialization is possible in that during the senior year the student may elect courses in such fields as refrigeration, air conditioning, automotive engineering, internal combustion engines, and metallurgy.

The work of practicing mechanical engineers varies from general engineering to highly specialized fields. The work log-

ically falls under **design, construction and erection, operation and maintenance, research,** and **administration.**

Design engineers may find their work to be that of original design of machines and associated equipment; design of operating assemblies of machines and equipment commercially available for desired manufacturing or process jobs; redesign of existing equipment to make possible changes, improvements, economics, safety, and better appearance.

Construction and erection engineers may be responsible for assembling and fabricating entire plants and putting them into operation. They must be able to use engineering drawings, plans, and specifications, and to do supplementary design work.

Operation and maintenance engineers are in charge of plant performance and upkeep. They must be capable of securing profitable operation and of the supervision of plant personnel.

Research engineers are called on for an endless variety of investigations. They must have inquiring minds, initiative, patience, thorough knowledge of the fields in which they work, and the ability to analyze and correlate the results obtained. For the research man, graduate study is usually desirable.

Many engineers who have the leadership ability, personality, tact, and initiative become **administrators and executives.**

Among the industries that employ a large number of mechanical engineers are: air conditioning, aircraft, automotive, chemical, power, petroleum, refrigeration, and general manufacturing.

Sales engineers are probably as much in demand as any other group.

PETROLEUM ENGINEERING

The curricula in petroleum engineering are intended to prepare students for the petroleum industry and particularly for those branches which have to do with drilling, production, and transportation of petroleum as well as with the natural gas industry.

Six courses in petroleum engineering are available to the students in this department: (1) A regular four-year curriculum in petroleum engineering, which leads to a degree of Bachelor of Science; (2) A five-year curriculum in petroleum

engineering, which leads to a degree of Bachelor of Petroleum Engineering; (3) A five-year curriculum in petroleum engineering—general business, which leads to a Bachelor of Science degree in Petroleum Engineering and the degree of Bachelor of Business Administration; (4) A five-year curriculum in petroleum engineering—chemical engineering, which leads to a Bachelor of Science degree in both Petroleum Engineering and Chemical Engineering; (5) A five-year curriculum in petroleum engineering—geological engineering, which leads to a Bachelor of Science degree in both Petroleum Engineering and Geological Engineering; (6) A five-year curriculum in petroleum engineering—mechanical engineering, which leads to a Bachelor of Science degree in both Petroleum Engineering and Mechanical Engineering.

The five-year courses include all of the subjects given in the four-year curriculum.

The four-year curriculum in petroleum engineering includes sufficient training in civil, mechanical, and electrical engineering to prepare the graduate for the application of engineering principles to the petroleum industry. Courses in geology give an understanding of the geological structures and conditions favorable for petroleum deposits. To the basic subjects are added courses in petroleum engineering which illustrate the application of engineering principles to the type of problems met in the petroleum industry and which also give some understanding of the technique of the industry. Emphasis is placed on thorough grounding in the fundamentals rather than on application to particular problems.

The five-year curriculum in petroleum engineering is designed to provide a broader educational background. This curriculum contains all the courses included in the four-year curriculum and courses in psychology, accounting, English, economics, business, geography, and advanced mathematics.

PETROLEUM ENGINEERING—GENERAL BUSINESS

The five-year curriculum in petroleum engineering—general business leads to a Bachelor of Science degree in Petroleum Engineering and the degree of Bachelor of Business Administration. This curriculum includes all the courses required in the four-year petroleum engineering and the four-year general business curricula and will provide the student with an excellent engineering background particularly applicable to the development, production, and transportation phases of the

petroleum industry as well as a broad business foundation applicable to any industry.

PETROLEUM ENGINEERING—CHEMICAL ENGINEERING

The five-year curriculum in petroleum engineering—chemical engineering leads to a Bachelor of Science degree in both Petroleum Engineering and Chemical Engineering This curriculum includes all of the courses required in the four-year petroleum engineering and the four-year chemical engineering curricula and is intended to provide a background so that the graduate may have the necessary fundamentals to engage in refining, natural gasoline, development, production, or transportation phase of the petroleum industry.

PETROLEUM ENGINEERING—GEOLOGICAL ENGINEERING

The five-year petroleum engineering—geological engineering course includes all of the subjects given in the four-year petroleum engineering course and all of the subjects in the four-year geological engineering course. This course is intended to give a student interested in geology a background in engineering and the application of geology and engineering to the petroleum industry.

PETROLEUM ENGINEERING—MECHANICAL ENGINEERING

The five-year curriculum in petroleum engineering—mechanical engineering leads to Bachelor of Science degrees in both Petroleum Engineering and Mechanical Engineering. The scope of the work in the petroleum industry is so broad and so varied that it is desirable for the man who expects to enter this field to have a very comprehensive training. This course is designed to give such breadth of training by including the essential courses in both the petroleum and mechanical curricula. The production, transportation, and refining of oil involves the generation and utilization of power, the design and operation of mechanical equipment, the principles of heat transfer, and the handling of men and finances. Thus, a five-year curriculum combining the two courses was deemed desirable.

Curricula in ARCHITECTURE AND ARCHITECTURAL CONSTRUCTION

FRESHMAN YEAR

First Semester		Credit	Second Semester		Credit
Architecture 101 Architecture I	(0-9)	3	Architecture 102 Architecture I	(0-9)	3
English 103 Composition and Rhetoric	(3-0)	3	English 104 Composition and Rhetoric	(3-0)	3
History 105 History of the United States	(3-0)	3	History 106 History of the United States	(3-0)	3
Mathematics 102 College Algebra	(3-0)	3	Mathematics 116 Plane Trigonometry and Analytics	(4-0)	4
Mechanical Engineering 105 Carpentry and Mill Work	(1-6)	3	Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R	Elective		2
		16	Physical Education 102	(0-2)	R
					17

SOPHOMORE YEAR

Architecture 201 Architecture II	(0-15)	5	Architecture 202 Architecture II	(0-15)	5
Architecture 205 Freehand Drawing	(0-3)	1	Architecture 206 Freehand Drawing	(0-3)	1
English 210 Writing and Discussion	(2-0)	2	Architecture 228 Elements of Mechanics	(3-0)	3
Mathematics 223 Differential and Integral Calculus	(4-0)	4	Civil Engineering 201 Plane Surveying	(3-3)	4
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-2)	4	Physics 202 College Physics	(3-3)	4
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		17			18

At the beginning of his junior year, a student who has a grade point ratio of 1.5 or more in his major courses may, with the consent of the Head of the Department of Architecture, choose one of the following options:

Option I: Design Option
Option II: Construction Option

Option I leads to the degree of Bachelor of Architecture; Option II leads to the degree of Bachelor of Science in Architectural Construction.

Students who are interested in architecture as a career are encouraged to choose Option I; students interested in building construction are encouraged to choose Option II.

JUNIOR YEAR

(Option I)

Architecture 301 Architecture III	(0-18)	6	Architecture 302 Architecture III	(0-18)	6
Architecture 305 Freehand Drawing	(0-3)	1	Architecture 306 Freehand Drawing	(0-3)	1
Architecture 327 Construction I	(3-0)	3	Architecture 328 Construction I	(3-0)	3
Architecture 329 Art and Civilization	(2-0)	2	Architecture 330 Art and Civilization	(2-0)	2
Architecture 353 Technology of Materials	(2-0)	2	Architecture 354 Technology of Materials	(2-0)	2
Elective		3	Elective		3
		17			17

SENIOR YEAR

(Option I)

First Semester		Credit
Architecture 401 Architecture IV	(0-18)	6
Architecture 427 Construction II	(2-2)	3
Architecture 429 History of Architecture	(3-0)	3
Landscape Architecture 411 Landscape Design for the Architect and Engineer	(2-2)	3
Elective		3
		18

Second Semester		Credit
Architecture 402 Architecture IV	(0-18)	6
Architecture 428 Construction II	(2-2)	3
Architecture 430 History of Architecture	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		3
		18

SUMMER WORK

Architecture 500; Summer Practice, twelve weeks, required.

FIFTH YEAR

(Option I)

Architecture 501 Architecture V	(0-18)	6
Electrical Engineering 436 Electrical Equipment for Buildings	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Mechanical Engineering 335 Mechanical Equipment of Buildings	(3-0)	3
Elective		2
		16

Architecture 454 Specifications and Working Drawings	(1-6)	3
Architecture 502 Architecture V	(0-18)	6
Architecture 550 Seminar	(1-0)	1
Architecture 554 Professional Practice	(2-0)	2
Architecture 556 City Planning	(2-3)	3
English 371 Great Books	(3-0)	3
		18

JUNIOR YEAR

(Option II)

Architecture 327 Construction I	(3-0)	3
Architecture 329 Art and Civilization	(2-0)	2
Architecture 353 Technology of Materials	(2-0)	2
Economics 403 Principles of Economics	(3-0)	3
History 306 American National Government	(3-0)	3
Elective		5
		18

Architecture 328 Construction I	(3-0)	3
Architecture 330 Art and Civilization	(2-0)	2
Architecture 354 Technology of Materials	(2-0)	2
Business Administration 409 Survey of Accounting Principles	(3-0)	3
Civil Engineering 315 Strength of Materials Laboratory	(0-2)	1
Geology 422 Natural Structural Materials	(2-3)	3
Elective		3
		17

SENIOR YEAR

(Option II)

First Semester		Credit
Architecture 427 Construction II	(2-2)	3
Architecture 429 History of Architecture	(3-0)	3
Architecture 454 Specifications and Working Drawings	(1-6)	3
Business Administration 305 Business Law	(3-0)	3
Civil Engineering 473 Cost Estimating	(3-0)	3
Elective		3
		18

Second Semester		Credit
Architecture 428 Construction II	(2-2)	3
Architecture 430 History of Architecture	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Civil Engineering 478 Construction Plant and Methods	(3-0)	3
English 371 Great Books	(3-0)	3
Elective		3
		18

SUMMER WORK

Architecture 500; Summer Practice, twelve weeks, required.

FIFTH YEAR

(Option II)

Architecture 527 Construction III	(2-3)	3
Architecture 554 Professional Practice	(2-0)	2
Civil Engineering 408 Municipal Administration	(3-0)	3
Industrial Engineering 412 Labor and Industry	(3-0)	3
Mechanical Engineering 335 Mechanical Equipment of Buildings	(3-0)	3
Elective		2
		16

Architecture 528 Construction III	(2-3)	3
Architecture 550 Seminar	(1-0)	1
Civil Engineering 465 Soil Mechanics and Foundations	(2-2)	3
Electrical Engineering 436 Electrical Equipment for Buildings	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
Elective		5
		17

Curricula in ENGINEERING

(With the exception of architecture, industrial education, and the paleontology and business options in geology, the curricula for all engineering programs are identical in the freshman year.)

FRESHMAN YEAR

Chemistry 101 General Chemistry	(3-3)	4
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Chemistry 102 General Chemistry	(3-3)	4
Engineering Drawing 106 Descriptive Geometry	(0-6)	2
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 104 Analytics	(3-0)	3
Mechanical Engineering 108 Engineering Problems	(2-3)	3
Military or Air Science	(0-3)	1
Elective		2
Physical Education 102	(0-2)	R
		18

Curriculum in
AERONAUTICAL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Economics 205 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Mathematics 209 Calculus	(3-0)	3
Mechanical Engineering 201 Welding and Foundry	(0-3)	1
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Aeronautical Engineering 201 Elementary Aerodynamics	(3-3)	4
English 207 Report Writing and Correspondence	(2-0)	2
Mathematics 210 Calculus	(3-0)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Mechanical Engineering 309 Machine Shop	(0-3)	1
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		19

JUNIOR YEAR

Aeronautical Engineering 301 Theoretical Aerodynamics	(3-0)	3
Aeronautical Engineering 304 Elementary Aircraft Structures	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Mathematics 307 Calculus	(3-0)	3
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Elective		3
		18

Aeronautical Engineering 302 Experimental Aerodynamics	(1-3)	2
Aeronautical Engineering 303 High Speed Aerodynamics	(3-0)	3
Aeronautical Engineering 306 Strength of Aircraft Materials	(2-3)	3
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Mechanical Engineering 338 Kinematics and Machine Design	(2-3)	3
Elective		3
		18

SENIOR YEAR

Aeronautical Engineering 401 Aircraft Design	(2-6)	4
Aeronautical Engineering 403 Aircraft Materials and Processes	(1-3)	2
Aeronautical Engineering 405 Aircraft Structures	(3-0)	3
Electrical Engineering 307 Electrical Circuits	(3-3)	4
Mechanical Engineering 410 Internal Combustion Engines	(3-0)	3
Elective		3
		19

Aeronautical Engineering 402 Aircraft Design	(2-6)	4
Aeronautical Engineering 406 Aircraft Power Plant Operation	(2-3)	3
Aeronautical Engineering 408 Seminar	(1-0)	1
English 401 Public Speaking	(0-2)	1
Technical Elective		6
Elective		3
		18

Technical Electives for AERONAUTICAL ENGINEERING

Group A		
Aeronautical Engineering 410	(2-3)	3
Airplane Detail Design		
Aeronautical Engineering 415	(2-3)	3
Flight Test Engineering		
Aeronautical Engineering 417	(3-0)	3
Aircraft Propulsion Systems		
Aeronautical Engineering 418	(4-0)	4
Advanced Aerodynamics		
Aeronautical Engineering 421	(3-0)	3
Dynamics of Airplanes		

Group B		
Chemical Engineering 447	(3-0)	3
Nuclear Engineering		
Electrical Engineering 501	(3-3)	4
Theory and Application of Electron Tubes		
Industrial Engineering 401	(3-0)	3
Survey of Industrial Engineering		
Mathematics 308	(3-0)	3
Differential Equations		
Mechanical Engineering 440	(2-3)	3
Physical Metallurgy		

NOTE: At least one of the technical electives in the senior year must be selected from Group A.

Curriculum in AGRICULTURAL ENGINEERING

(See page 119)

Curriculum in CHEMICAL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Chemistry 205	(2-6)	4
Qualitative Analysis		
English 203	(2-0)	2
Composition and Literature		
History 306	(3-0)	3
American National Government		
Mathematics 209	(3-0)	3
Calculus		
Military or Air Science	(0-3)	1
Physics 203	(4-3)	5
General Physics		
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemical Engineering 204	(3-0)	3
Elementary Chemical Engineering		
Chemistry 216	(2-6)	4
Quantitative Analysis		
English 210	(2-0)	2
Writing and Discussion		
Mathematics 210	(3-0)	3
Calculus		
Military or Air Science	(0-3)	1
Physics 204	(4-3)	5
General Physics		
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Chemical Engineering 304	(3-0)	3
Unit Operations		
Chemistry 301	(3-3)	4
Organic Chemistry		
Chemistry 323	(3-3)	4
Physical Chemistry		
English 401	(0-2)	1
Public Speaking		
Mechanical Engineering 327	(3-0)	3
Thermodynamics		
*Elective		3
		18

Chemical Engineering 314	(0-3)	1
Unit Operations Laboratory		
Chemical Engineering 423	(3-0)	3
Unit Operations		
Chemistry 302	(3-3)	4
Organic Chemistry		
Chemistry 324	(3-3)	4
Physical Chemistry		
Mechanical Engineering 212	(3-0)	3
Engineering Mechanics		
**Elective		3
		18

*Students not electing advanced ROTC will register for Economics 403.
**Students not electing advanced ROTC will register for Mathematics 307.

SENIOR YEAR

First Semester		Credit
Chemical Engineering 409 Oil and Gas Technology	(3-0)	3
Chemical Engineering 429 Oil and Gas Technology Laboratory	(0-3)	1
Chemical Engineering 433 Unit Operations Laboratory	(0-3)	1
Chemical Engineering 438 Seminar	(1-0)	1
Chemical Engineering 441 Chemical Engineering Unit Processes	(3-0)	3
Chemical Engineering 454 Chemical Engineering Thermodynamics	(3-0)	3
Chemical Engineering 461 Process Control and Instrumentation	(2-0)	2
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Civil Engineering 315 Strength of Materials Laboratory	(0-2)	1
Elective		3
		21

Second Semester		Credit
Chemical Engineering 426 Plant Design	(2-6)	4
Chemical Engineering 428 Industrial Chemical Processes	(3-0)	3
Chemical Engineering 464 Chemical Engineering Kinetics	(3-0)	3
Electrical Engineering 305 Electrical Machinery	(3-3)	4
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Elective		3
		19

Five-Year Curriculum in CHEMICAL ENGINEERING—GENERAL BUSINESS

FRESHMAN AND SOPHOMORE YEARS

(Same as for a major in chemical engineering)

SUMMER

First Term		Credit
Business Administration 227 Principles of Accounting	(9-9)	4
Economics 403 Principles of Economics	(9-0)	3
		7

Second Term		Credit
Business Administration 205 Marketing	(9-0)	3
Business Administration 228 Principles of Accounting	(9-9)	4
		7

JUNIOR YEAR

First Semester		Credit
Chemical Engineering 304 Unit Operations	(3-0)	3
Chemistry 301 Organic Chemistry	(3-3)	4
Chemistry 323 Physical Chemistry	(3-3)	4
English 401 Public Speaking	(0-2)	1
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Elective		3
		18

Second Semester		Credit
Chemical Engineering 314 Unit Operations Laboratory	(0-3)	1
Chemical Engineering 423 Unit Operations	(3-0)	3
Chemistry 302 Organic Chemistry	(3-3)	4
Chemistry 324 Physical Chemistry	(3-3)	4
Mechanical Engineering 327 Thermodynamics	(3-0)	3
*Elective		3
		18

*Students not electing advanced ROTC will register for Mathematics 307.

SENIOR YEAR

First Semester		Credit
Business Administration 303 Statistical Method	(3-3)	4
Chemical Engineering 433 Unit Operations Laboratory	(0-3)	1
Chemical Engineering 441 Chemical Engineering Unit Processes	(3-0)	3
Chemical Engineering 454 Chemical Engineering Thermodynamics	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Elective		3
		19

Second Semester		Credit
Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 310 Credits and Collections	(2-0)	2
Chemical Engineering 426 Plant Design	(2-6)	4
Economics 311 Money and Banking	(3-0)	3
Electrical Engineering 305 Electrical Machinery	(3-3)	4
Elective		3
		19

SUMMER

First Term		Credit
Business Administration 418 Corporation Finance	(9-0)	3
Economics 319 Economic Development of the United States	(9-0)	3
		6

FIFTH YEAR

First Semester		Credit
Business Administration 305 Business Law	(3-0)	3
Business Administration 315 Insurance	(3-0)	3
Business Administration 329 Cost Accounting	(3-0)	3
Chemical Engineering 409 Oil and Gas Technology	(3-0)	3
Chemical Engineering 429 Oil and Gas Technology Laboratory	(0-3)	1
Chemical Engineering 438 Seminar	(1-0)	1
Chemical Engineering 461 Process Control and Instrumentation	(2-0)	2
Chemical Engineering 464 Chemical Engineering Kinetics	(3-0)	3
		19

Second Semester		Credit
Business Administration 306 Business Law	(3-0)	3
Business Administration 404 Managerial Accounting	(3-0)	3
Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Chemical Engineering 428 Industrial Chemical Processes	(3-0)	3
		18

Curriculum in CIVIL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

Civil Engineering 201 Plane Surveying	(3-3)	4
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		18

Civil Engineering 202 Advanced Surveying	(2-3)	3
Economics 205 Principles of Economics	(3-0)	3
Mathematics 210 Calculus	(3-0)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		18

SUMMER WORK

Civil Engineering 300s, Summer Surveying Practice, six weeks, credit 5.

JUNIOR YEAR

First Semester		Credit
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Civil Engineering 311 Hydraulics	(3-0)	3
Civil Engineering 315 Strength of Materials Laboratory	(0-2)	1
Civil Engineering 336 Hydraulics Laboratory	(0-2)	1
Civil Engineering 345 Analysis of Simple Structures	(3-3)	4
Geology 320 Geology for Civil Engineers	(2-3)	3
Elective		3
		18

Second Semester		Credit
Civil Engineering 338 Elementary Hydrology	(2-0)	2
Civil Engineering 344 Plain and Reinforced Concrete	(2-3)	3
Civil Engineering 346 Design of Members and Connections	(2-3)	3
Civil Engineering 401 Water and Sewage Treatment	(2-2)	3
Civil Engineering 465 Soil Mechanics and Foundations	(2-2)	3
English 210 Writing and Discussion	(2-0)	2
Elective		3
		19

SENIOR YEAR

Civil Engineering 402 Water Supply and Sewerage Practice	(2-2)	3
Civil Engineering 407 Roads and Pavements	(3-0)	3
Civil Engineering 473 Cost Estimating	(3-0)	3
Civil Engineering 483 Analysis and Design of Structures	(2-3)	3
Technical Elective		3
Elective		3
		18

Civil Engineering 443 Materials of Construction	(1-3)	2
Civil Engineering 448 Engineering Economy	(2-0)	2
Civil Engineering 474 Contracts and Specifications	(2-0)	2
Civil Engineering 476 Seminar	(1-0)	1
Electrical Engineering 305 Electrical Machinery	(3-3)	4
English 401 Public Speaking	(0-2)	1
Technical Elective		3
Elective		3
		18

For the Class Graduating in 1954-55

SENIOR YEAR

Civil Engineering 402 Water Supply and Sewerage Practice	(2-2)	3
Civil Engineering 407 Roads and Pavements	(3-0)	3
Civil Engineering 443 Materials of Construction	(1-3)	2
Civil Engineering 473 Cost Estimating	(3-0)	3
Civil Engineering 483 Analysis and Design of Structures	(2-3)	3
Technical Elective		3
Elective		3
		20

Civil Engineering 448 Engineering Economy	(2-0)	2
Civil Engineering 474 Contracts and Specifications	(2-0)	2
Civil Engineering 476 Seminar	(1-0)	1
Economics 403 Principles of Economics	(3-0)	3
Electrical Engineering 305 Electrical Machinery	(3-3)	4
English 401 Public Speaking	(0-2)	1
Technical Elective		3
Elective		3
		19

TECHNICAL ELECTIVES

(Offered in Fall Semester only)

Civil Engineering 406 Sanitation and Public Health	(3-0)	3
Civil Engineering 408 Municipal Administration	(3-0)	3
Civil Engineering 409 Sanitary Laboratory	(2-3)	3
Civil Engineering 457 Traffic and Its Control	(3-0)	3
Civil Engineering 463 Hydrology	(2-3)	3
Civil Engineering 468 Statically Indeterminate Structures	(2-3)	3
Civil Engineering 482 Aerial Photogrammetry	(2-3)	3
Geology 441 Advanced Engineering Geology	(3-3)	4

(Offered in Spring Semester only)

Civil Engineering 403 Sanitary Design	(2-3)	3
Civil Engineering 417 Bituminous Materials	(2-3)	3
Civil Engineering 458 Hydraulic Engineering	(3-0)	3
Civil Engineering 478 Construction Plant and Methods	(3-0)	3
Civil Engineering 484 Design of Bridges and Buildings	(2-3)	3

NOTE: By proper choice of technical electives, civil engineering students may specialize to some extent in highway, hydraulic, structural, construction, or sanitary engineering.

Curriculum in ELECTRICAL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Civil Engineering 206 Plane Surveying	(0-3)	1
Electrical Engineering 201 Electricity and Magnetism	(3-4)	4
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 207 General Physics	(3-3)	4
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Economics 205 Principles of Economics	(3-0)	3
Electrical Engineering 208 Direct Current Machinery	(3-3)	4
Mathematics 210 Calculus	(3-0)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 208 General Physics	(3-3)	4
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

Civil Engineering 305 Mechanics of Materials	(3-0)	3
Electrical Engineering 315 Alternating Currents	(3-3)	4
English 301 Writing for Professional Men	(3-0)	3
Mathematics 307 Calculus	(3-0)	3
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Elective		3
		19

Electrical Engineering 316 Electrical Circuit Theory	(3-0)	3
Electrical Engineering 318 Field Theory and Electrical Measurements	(2-3)	3
Electrical Engineering 320 Electronics	(3-3)	4
Mathematics 308 Differential Equations	(3-0)	3
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Elective		3
		20

SENIOR YEAR

First Semester		Credit
Electrical Engineering 401 Alternating Current Machinery	(3-0)	3
Electrical Engineering 403 Alternating Current Laboratory	(1-3)	2
Electrical Engineering 415 Transmission Networks	(3-0)	3
Electrical Engineering 419 Radio Communication	(3-3)	4
Electrical Engineering 449 Seminar	(0-2)	1
English 401 Public Speaking	(0-2)	1
Technical Elective		3
Elective		3
		20

Second Semester		Credit
Business Administration 305 Business Law	(3-0)	3
Electrical Engineering 402 Alternating Current Machinery	(3-0)	3
Electrical Engineering 404 Alternating Current Laboratory	(1-3)	2
Electrical Engineering 432 Public Utility Problems	(3-0)	3
Electrical Engineering 450 Seminar	(0-2)	1
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Technical Elective		3
Elective		3
		20

TECHNICAL ELECTIVES

Electrical Engineering 406 Electric Power Distribution and Transmission	(2-2)	3
Electrical Engineering 420 Servo-Mechanisms and Control Devices	(3-0)	3
Electrical Engineering 428 Communication Circuits	(2-3)	3
Electrical Engineering 441 Symmetrical Components of Polyphase Circuits	(3-0)	3
Electrical Engineering 446 Television	(2-3)	3
Electrical Engineering 502 Ultra High Frequency Techniques	(2-3)	3
Electrical Engineering 503 Radiation and Propagation	(3-0)	3
Geology 435 Geophysical Prospecting for Petroleum	(3-3)	4
Mathematics 409 Advanced Calculus	(3-0)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Mechanical Engineering 404 Engineering Laboratory	(1-3)	2
Mechanical Engineering 407 Mechanical Refrigeration	(3-0)	3
Mechanical Engineering 436 Heating, Ventilating, and Air Conditioning	(3-0)	3
Mechanical Engineering 440 Physical Metallurgy	(2-3)	3
Physics 401 Optics	(3-3)	4
Physics 405 Physical Mechanics	(3-0)	3
Physics 407 Geophysics and Geophysical Methods	(3-0)	3

Curriculum in GEOLOGY

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

English 203 Composition and Literature	(2-0)	2
Geology 201 General Geology	(3-0)	3
Geology 203 Crystallography and Mineralogy	(2-6)	4
Geology 209 Introduction to Field Work	(0-3)	1
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		19

Chemistry 207 Elementary Quantitative Analysis	(2-3)	3
Civil Engineering 208 Topographic Surveying	(1-3)	2
Geology 204 Mineralogy and Rock Study	(1-3)	2
Geology 210 Historical Geology	(3-3)	4
Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		20

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

First Semester		Credit
Chemistry 344 Physical Chemistry	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Geology 303 Petrography and Petrology	(2-3)	3
Geology 305 Invertebrate Paleontology	(3-3)	4
Geology 315 Principles of Sedimentation	(2-3)	3
Elective		3
		18

Second Semester		Credit
Geology 306 Stratigraphy	(3-3)	4
Geology 312 Structural Geology	(2-3)	3
Geology (two of the following)		6
Geology 304 Sedimentary Petrography	(2-3)	3
Geology 423 Micropaleontology	(1-6)	3
Geology 443 Paleontology	(2-3)	3
History 306 American National Government	(3-0)	3
Elective		3
		19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

Geology 431 Geomorphology	(2-3)	3
Geology 435 Geophysical Prospecting for Petroleum	(3-3)	4
Geology 449 Seminar	(1-0)	1
**Technical Elective		3
Elective		6
		17

Economics 403 Principles of Economics	(3-0)	3
English 401 Public Speaking	(0-2)	1
Geology 406 Economic Geology	(3-0)	3
Geology 433 Field Geology	(0-6)	2
Geology 450 Seminar	(1-0)	1
**Technical Elective		3
Elective		6
		19

Curriculum in GEOLOGY

(Business Option)

FRESHMAN YEAR

Chemistry 101 General Chemistry	(3-3)	4
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 102 Algebra	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
Engineering Drawing 106 Descriptive Geometry	(0-6)	2
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 104 Analytics	(3-0)	3
Mechanical Engineering 101 Engineering Problems	(0-3)	1
Military or Air Science	(0-3)	1
Physical Education 102	(0-2)	R
		17

*May be used as elective.
**Technical electives are listed on page 202.

SOPHOMORE YEAR

First Semester		Credit
English 203 Composition and Literature	(2-0)	2
Geology 201 General Geology	(3-0)	3
Geology 203 Crystallography and Mineralogy	(2-6)	4
Geology 209 Introduction to Field Work	(0-3)	1
History 325 Trends in American History	(3-0)	3
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemistry 207 Elementary Quantitative Analysis	(2-3)	3
Economics 205 Principles of Economics	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Geology 204 Mineralogy and Rock Study	(1-3)	2
Geology 210 Historical Geology	(3-3)	4
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Physical Education 202	(0-2)	R
		19

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

Business Administration 205 Marketing	(3-0)	3
Business Administration 305 Business Law	(3-0)	3
Geology 303 Petrography and Petrology	(2-3)	3
Geology 305 Invertebrate Paleontology	(3-3)	4
Geology 315 Principles of Sedimentation	(2-3)	3
Elective		3
		19

Business Administration 303 Statistical Method	(3-3)	4
Civil Engineering 208 Topographic Surveying	(1-3)	2
Geology 306 Stratigraphy	(3-3)	4
Geology 312 Structural Geology	(2-3)	3
History 306 American National Government	(3-0)	3
Elective		3
		19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

Business Administration 409 Survey of Accounting Principles	(3-0)	3
Business Administration 428 Real Estate Titles and Conveyances	(3-0)	3
Geology 431 Geomorphology	(2-3)	3
Geology 449 Seminar	(1-0)	1
**Technical Elective		6
Elective		3
		19

Business Administration 430 Cost Accounting Survey	(3-0)	3
Business Administration (elective)		3
English 401 Public Speaking	(0-2)	1
Geology 406 Economic Geology	(3-0)	3
Geology 433 Field Geology	(0-6)	2
Geology 450 Seminar	(1-0)	1
**Technical Elective		3
Elective		3
		19

*May be used as an elective.

**Technical electives are listed on page 202.

Curriculum in GEOLOGY
(Geophysics Option)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

(Same as for curriculum in Geology, page 195)

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

First Semester		Credit
Chemistry 344 Physical Chemistry	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Geology 305 Invertebrate Paleontology	(3-3)	4
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		19

Second Semester		Credit
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Geology 306 Stratigraphy	(3-3)	4
Geology 312 Structural Geology	(2-3)	3
Mathematics 308 Differential Equations	(3-0)	3
Physics 407 Geophysics and Geophysical Methods	(3-0)	3
Elective		3
		19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

English 401 Public Speaking	(0-2)	1
Geology 315 Principles of Sedimentation	(2-3)	3
Geology 404 Geology of Petroleum	(2-3)	3
Geology 435 Geophysical Prospecting for Petroleum	(3-3)	4
Geology 449 Seminar	(1-0)	1
Physics 319 Instrumentation for Geophysics	(2-3)	3
Elective		3
		18

Economics 403 Principles of Economics	(3-0)	3
Geology 425 Subsurface Geology	(2-3)	3
****Geology 433** Field Geology	(0-6)	2
Geology 436 Interpretation of Geophysical Data	(1-6)	3
Geology 450 Seminar	(1-0)	1
History 306 American National Government	(3-0)	3
Elective		3
		18

*May be used as an elective.

**Students are advised to substitute Geology 399, a summer camp, for Geology 433, thereby reducing the number of laboratory hours during this semester.

Curriculum in GEOLOGY

(Paleontology Option)

FRESHMAN YEAR

(Same as for the curriculum in geology, business option, page 196)

SOPHOMORE YEAR

(Same as for the curriculum in geology, business option, page 197)

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Civil Engineering 208 Topographic Surveying	(1-3)	2	**Geology 306** Stratigraphy	(3-3)	4
Geology 303 Petrography and Petrology	(2-3)	3	**Geology 312** Structural Geology	(2-3)	3
Geology 305 Invertebrate Paleontology	(3-3)	4	**Geology 423** Micropaleontology	(1-6)	3
Geology 315 Principles of Sedimentation	(2-3)	3	**Geology 443** Paleontology	(2-3)	3
Modern Language French or German	(3-0)	3	**Modern Language** French or German	(3-0)	3
Elective		3	**Elective**		3
		18			19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

English 401 Public Speaking	(0-2)	1	**Geology 406** Economic Geology	(3-0)	3
Geology 431 Geomorphology	(2-3)	3	**Geology 433** Field Geology	(0-6)	2
Geology 437 Cenozoic Micropaleontology	(1-6)	3	**Geology 439** Mesozoic Micropaleontology	(1-6)	3
Geology 449 Seminar	(1-0)	1	**Geology 450** Seminar	(1-0)	1
History 306 American National Government	(3-0)	3	**Modern Language** French or German	(3-0)	3
Modern Language French or German	(3-0)	3	**Technical Elective**		3
Elective		3	**Elective**		3
		17			18

*May be used as an elective.

**Technical electives are listed on page 202.

Five-Year Curriculum in GEOLOGY-PETROLEUM ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior petroleum engineering courses.)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

(Same as for curriculum in Geology, page 195)

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

First Semester		Credit	Second Semester		Credit
Chemistry 225 Elementary Organic Chemistry	(3-0)	3	**Chemistry 344** Physical Chemistry	(3-0)	3
Geology 303 Petrography and Petrology	(2-3)	3	**Civil Engineering 305** Mechanics of Materials	(3-0)	3
Geology 305 Invertebrate Paleontology	(3-3)	4	**Geology 306** Stratigraphy	(3-3)	4
Geology 315 Principles of Sedimentation	(2-3)	3	**Geology 312** Structural Geology	(2-3)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3	**Mechanical Engineering 344** Fluid Mechanics	(3-0)	3
Elective		3	**Elective**		3
		19			19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

Electrical Engineering 305 Electrical Machinery	(3-3)	4	**Economics 403** Principles of Economics	(3-0)	3
English 319 Report Writing	(1-0)	1	**Geology 425** Subsurface Geology	(2-3)	3
English 401 Public Speaking	(0-2)	1	****Geology 433** Field Geology	(0-6)	2
Geology 404 Geology of Petroleum Geology of Petroleum Engineering Mechanics	(2-3)	3	**Mechanical Engineering 323** Thermodynamics	(4-0)	4
Mechanical Engineering 313 Petroleum Development	(3-0)	3	**Petroleum Engineering 306** Petroleum Production Methods	(3-0)	3
Petroleum Engineering 305 Petroleum Development Laboratory	(3-0)	3	**Petroleum Engineering 308** Petroleum Production Laboratory	(0-3)	1
Elective		3	**Elective**		3
		19			19

*May be used as an elective.

**Students are advised to substitute Geology 399, a summer camp, for Geology 433, thereby reducing the number of laboratory hours during this semester.

FIFTH YEAR

First Semester		Credit
Geology 431 Geomorphology	(2-3)	3
Geology 435 Geophysical Prospecting for Petroleum	(3-3)	4
Geology 449 Seminar	(1-0)	1
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
		20

Second Semester		Credit
Geology 406 Economic Geology	(3-0)	3
Geology 450 Seminar	(1-0)	1
History 306 American National Government	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
		19

Curriculum in GEOLOGICAL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

(Same as for the curriculum in geology, page 195)

SUMMER CAMP

(Optional*)

Geology 299, Field Geology, credit 2.

JUNIOR YEAR

English 319 Report Writing	(1-0)	1
Geology 305 Invertebrate Paleontology	(3-3)	4
Geology 315 Principles of Sedimentation	(2-3)	3
Mechanical Engineering 220 Engineering Mechanics	(4-0)	4
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		19

Chemistry 344 Physical Chemistry	(3-0)	3
English 401 Public Speaking	(0-2)	1
Geology 306 Stratigraphy	(3-3)	4
Geology 312 Structural Geology	(2-3)	3
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3
		18

*May be used as elective.

SUMMER CAMP

Geology 300, Field Geology, credit 6.

SENIOR YEAR

First Semester		Credit
Economics 403 Principles of Economics	(3-0)	3
Electrical Machinery 305 Electrical Machinery	(3-3)	4
Geology 404 Geology of Petroleum	(2-3)	3
Geology 449 Seminar	(1-0)	1
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Elective		3
		18

Second Semester		Credit
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Geology 425 Subsurface Geology	(2-3)	3
Geology 433 Field Geology	(0-6)	2
Geology 450 Seminar	(1-0)	1
History 306 American National Government	(3-0)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Elective		3
		18

For the Class Graduating in 1954-55

SENIOR YEAR

Civil Engineering 311 Hydraulics	(3-0)	3
Civil Engineering 336 Hydraulics Laboratory	(0-2)	1
Electrical Engineering 305 Electrical Machinery	(3-3)	4
English 401 Public Speaking	(0-2)	1
Geology 404 Geology of Petroleum	(2-3)	3
Geology 449 Seminar	(1-0)	1
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Elective		3
		20

Civil Engineering 305 Mechanics of Materials	(4-0)	4
Economics 403 Principles of Economics	(3-0)	3
Geology 425 Subsurface Geology	(2-3)	3
Geology 433 Field Geology	(0-6)	2
Geology 450 Seminar	(1-0)	1
History 306 American National Government	(3-0)	3
Elective		3
		19

TECHNICAL ELECTIVES

Unless otherwise required, the following courses may be used as technical electives for all curricula in geology:

Geology 299 Field Geology		2
Geology 303 Petrography and Petrology	(2-3)	3
Geology 304 Sedimentary Petrography	(2-3)	3
Geology 399 Field Geology of the Gulf Coast Tertiary		6
Geology 404 Geology of Petroleum	(2-3)	3
Geology 406 Economic Geology	(3-0)	3
Geology 423 Micropaleontology	(1-6)	3
Geology 425 Subsurface Geology	(2-3)	3
Geology 431 Geomorphology	(2-3)	3
Geology 435 Geophysical Prospecting for Petroleum	(3-3)	4
Geology 436 Interpretation of Geophysical Data	(1-6)	3
Geology 437 Cenozoic Micropaleontology	(1-6)	3
Geology 439 Mesozoic Micropaleontology	(1-6)	3
Geology 443 Paleontology	(2-3)	3
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1

Curriculum in
INDUSTRIAL EDUCATION

(Group I)

Industrial Arts Teacher Education

FRESHMAN YEAR

First Semester		Credit
Engineering Drawing 105 Engineering Drawing	(0-6)	2
English 103 Composition and Rhetoric	(3-0)	3
Industrial Education 105 Wood Craft	(1-5)	3
Industrial Education 107 Industrial Materials and Manufacturing Processes	(2-3)	3
Mathematics 101 Algebra	(3-0)	3
Mechanical Engineering 201 Welding and Foundry	(0-3)	1
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		16

Second Semester		Credit
Chemistry 106 General Chemistry	(3-3)	4
Engineering Drawing 106 Descriptive Geometry	(0-6)	2
English 104 Composition and Rhetoric	(3-0)	3
Industrial Education 204 Development and Practice in Industrial Education	(2-0)	2
Mathematics 103 Plane Trigonometry	(3-0)	3
Mechanical Engineering 202 Welding and Foundry	(0-3)	1
Military or Air Science	(0-3)	1
Elective		2
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

Engineering Drawing 127 Industrial Freehand Sketching	(1-3)	2
Engineering Drawing 221 Building Construction Drawing	(1-3)	2
English 203 Composition and Literature	(2-0)	2
Industrial Education 205 Ornamental Iron	(1-5)	3
Mechanical Engineering 108 Engineering Problems	(2-3)	3
Mechanical Engineering 309 Machine Shop	(0-3)	1
Military or Air Science	(0-3)	1
Physics 201 College Physics	(3-3)	4
Physical Education 201	(0-2)	R
		18

Economics 205 Principles of Economics	(3-0)	3
Engineering Drawing 128 Methods of Industrial Reproduction	(0-2)	1
Engineering Drawing 222 Building Construction Drawing	(1-3)	2
Industrial Education 106 Sheet Metal	(1-5)	3
Mechanical Engineering 106 Cabinet Making	(1-6)	3
Mechanical Engineering 310 Machine Shop	(0-3)	1
Military or Air Science	(0-3)	1
Physics 202 College Physics	(3-3)	4
Physical Education 202	(0-2)	R
		18

JUNIOR YEAR

English 210 Writing and Discussion	(2-0)	2
History 306 American National Government	(3-0)	3
Industrial Education 301 Methods of Teaching and Class Management	(3-0)	3
Industrial Education 323 Methods of Teaching Mechanical Drawing	(1-3)	2
Industrial Education 327 Industrial Arts Handcraft	(1-5)	3
Psychology 301 Educational Psychology	(3-0)	3
Elective		3
		19

English 301 Writing for Professional Men	(3-0)	3
Industrial Education 304 Applied Industrial Electricity	(2-3)	3
Industrial Education 310 Course Making	(2-0)	2
Industrial Education 332 Plastics and Ceramics	(1-3)	
Or		
Industrial Education 334 Upholstery	(1-3)	2
Industrial Education 336 Design in the Arts and Crafts	(1-3)	2
Mechanical Engineering 329 Advanced Cabinet Making	(1-6)	3
Elective		3
		18

SENIOR YEAR

First Semester		Credit
English 403 Speaking for Professional Men	(1-2)	2
History 307 State and Local Government	(3-0)	3
Industrial Education 404 Visual Aids for Industrial Subjects	(1-2)	2
Industrial Education 406 Vocational Guidance	(2-0)	2
Industrial Education 415 Practice Teaching	(2-5)	4
Elective		6
		19

Second Semester		Credit
Education 322 Secondary School Administration	(3-0)	3
Industrial Education 326 General Metalwork	(1-5)	3
Industrial Education 416 Practice Teaching	(2-5)	4
Industrial Education 419 Laboratory of Industries Methods	(1-3)	2
Industrial Education 449 Seminar in Industrial Education	(1-0)	1
Elective		5
		18

Curriculum in INDUSTRIAL EDUCATION

(Group II)

Vocational Industrial Teacher Education

(Prerequisite: At least one full year of employed experience at some skilled trade or industrial technical occupation.)

A student who desires to graduate under this plan must submit a written request accompanied by a statement of his employed practical experience. Upon the approval of the request by the Head of the Department and the Dean of Engineering, the student will be permitted to plan a program within the limit of the courses listed below as approved by the Head of the Department.

Approved industrial experience will be evaluated in terms of college credits and, if acceptable to the Head of the Department and the Dean of the School of Engineering, may be used in the place of shop work on the basis of four credit hours for each year of experience up to a maximum of twenty credits. Approved teaching experience may be credited as practice teaching on the basis of two credit hours per year up to a maximum of six credits.

REQUIRED COURSES

GENERAL EDUCATION			Minimum Credits
English			10
English 103 Composition and Rhetoric	(3-0)	3	
English 104 Composition and Rhetoric	(3-0)	3	
English 203 Composition and Literature	(2-0)	2	
English 210 Writing and Discussion	(2-0)	2	
Mathematics			6
Mathematics 101 Algebra	(3-0)	3	
Mathematics 103 Plane Trigonometry	(3-0)	3	

(Required courses continued on next page)

REQUIRED COURSES (Cont.)

			Minimum Credits
Economics			6
Economics 205 or 403	(3-0)	3	
Principles of Economics			
Economics (elective)		3	
Rural Sociology			3
Sociology (elective)		3	
(Rural Sociology 315 not acceptable)			
History			6
History 306	(3-0)	3	
American National Government			
History 307	(3-0)	3	
State and Local Government			
Public Speaking			1
English 401	(0-2)	1	
Public Speaking			
TECHNICAL			
Shop Work			24
Includes credit for industrial work experience			
Engineering Drawing			4
Engineering Drawing 105	(0-6)	2	
Engineering Drawing			
Engineering Drawing 106	(0-6)	2	
Descriptive Geometry			
Engineering Problems			3
Mechanical Engineering 108	(2-3)	3	
Engineering Problems			
SCIENCE			
Chemistry			4
Chemistry 106	(3-3)	4	
General Chemistry			
Physics			8
Physics 201	(3-3)	4	
College Physics			
Physics 202	(3-3)	4	
College Physics			
Modern Industries			3
Industrial Education 308	(3-0)	3	
A Study of Modern Industries			
Industrial Supervision or Management			3
Industrial Education 429	(3-0)	3	
Foremanship and Supervision			
Or			
Industrial Engineering 401	(3-0)	3	
Survey of Industrial Engineering			
MILITARY TRAINING			
Military or Air Science			4
PROFESSIONAL EDUCATION			
The courses listed below are the basic ones required by the Vocational Division of the Texas Education Agency for a vocational certificate.			
General Requirements			8
Industrial Education 204	(2-0)	2	
Development and Practice in Industrial Education			
Industrial Education 301	(2-0)	2	
Methods of Teaching and Class Management			
Industrial Education 310	(2-0)	2	
Course Making			
Industrial Education 424	(1-2)	2	
Organization of Instructional Material			
Additional courses and related fields are listed below depending upon the certificate desired.			
For Vocational Industrial Shop Teachers			4
Visual Aids for Industrial Subjects			
Methods of Introducing Industrial Organization and Management into Industrial Schools			
For Part-Time Cooperative Training Coordinators			4
Follow-up, Visitation, and Coordination in Part-Time Schools			
Related Subjects in Part-Time Cooperative Programs			
Other general education courses suited to the needs of the student			8
ELECTIVE			
To be approved by the Head of the Department			35
TOTAL CREDITS			144

Curriculum in INDUSTRIAL EDUCATION

(Group III)

Industrial Technology

FRESHMAN AND SOPHOMORE YEARS

(Same as for Group 1, page 203)

JUNIOR YEAR

First Semester		Credit
Business Administration 409 Survey of Accounting Principles	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
History 306 American National Government	(3-0)	3
Industrial Education 308 A Study of Modern Industries	(3-0)	3
Industrial Education 326 General Metalwork	(1-5)	3
Physical Education 216 First Aid	(0-3)	1
Elective		3
		18

Second Semester		Credit
Business Administration 305 Business Law	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Industrial Education 304 Applied Industrial Electricity	(2-3)	3
Industrial Education 328 Industrial Accident Prevention	(3-0)	3
Industrial Engineering 401 Survey of Industrial Engineering	(3-0)	3
Elective		3
		18

SENIOR YEAR

English 403 Speaking for Professional Men	(1-2)	2
Industrial Education 423 Analysis Procedure	(1-2)	2
Industrial Education 429 Foremanship and Supervision	(3-0)	3
Industrial Engineering 404 Motion and Time Study	(2-3)	3
Journalism 321 Industrial Journalism	(2-2)	3
Psychology 401 Industrial Psychology	(3-0)	3
Elective		3
		19

Industrial Education 438 Industrial Safety	(2-3)	3
Industrial Education 449 Seminar in Industrial Education	(1-0)	1
Industrial Engineering 302 Production Engineering	(1-2)	2
Industrial Engineering 412 Labor and Industry	(3-0)	3
Approved Elective		7
Elective		3
		19

Electives for INDUSTRIAL EDUCATION

General electives for industrial education (Groups 1, 2, and 3) are to be selected from the general engineering electives shown on page 223.

Approved electives for industrial education (Groups 1, 2, and 3) may be selected from the following courses or from any sophomore, junior, or senior course offered by the Department of Engineering Drawing:

Chemistry 102 ..... (3-3) 4
General Chemistry
Education 426 ..... (3-0) 3
Tests and Measurements
Education 427 ..... (3-0) 3
Principles of Guidance
Education 433 3
Improvement of Reading, Spelling, and Speech
Education 435 ..... (3-0) 3
Audio-Visual Education
Geology 205 ..... (3-3) 4
Elementary Geology
Industrial Education 427 ..... (1-3) 2
Traffic Safety and Automobile Operation
Journalism 205 ..... (2-2) 3
Principles of Typography
Journalism 462 ..... (3-0) 3
School Publications
Mathematics 104 ..... (3-0) 3
Analytics
Mathematics 209 ..... (3-0) 3
Calculus
Mechanical Engineering 212 ..... (3-0) 3
Engineering Mechanics
Psychology 207 ..... (3-0) 3
General Psychology
Psychology 305 ..... (3-0) 3
Personality Adjustments
Psychology 323 ..... (3-0) 3
The Psychology of Adolescence
Psychology 402 ..... (3-0) 3
Advanced Educational Psychology
Rural Sociology 304 ..... (3-0) 3
Criminology and Juvenile Delinquency
Rural Sociology 408 ..... (2-0) 2
Organization for Boy Scout Work

Additional approved electives for industrial education (Groups 1 and 2) may be selected from required courses for Group 3 and/or from the following courses:

Physical Education 216 ..... (0-3) 1
First Aid
Physical Education 315 ..... (2-3) 3
Elementary School Physical Education
Physical Education 317 ..... (1-3) 2
Coaching of Football
Physical Education 318 ..... (1-3) 2
Coaching of Track
Physical Education 410 ..... (1-3) 2
Coaching of Baseball
Physical Education 419 ..... (1-3) 2
Coaching of Basketball

Additional approved electives for industrial education (Group 3) may be selected from required courses for Group 1 and/or from the following courses:

Business Administration 315 ..... (3-0) 3
Insurance
Business Administration 324 ..... (3-0) 3
Casualty Insurance and Suretyship
Industrial Engineering 415 ..... (1-3) 2
Production Control
Mechanical Engineering 455 ..... (2-3) 3
Applied Welding Technology

Those desiring to elect courses not listed above must secure the written approval of the Head of the Department of Industrial Education and of the Dean of the School of Engineering.

Curriculum in INDUSTRIAL ENGINEERING

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Economics 205	(3-0)	3
Principles of Economics		
English 203	(2-0)	2
Composition and Literature		
History 306	(3-0)	3
American National Government		
Mathematics 209	(3-0)	3
Calculus		
Mechanical Engineering 201	(0-3)	1
Welding and Foundry		
Mechanical Engineering 309	(0-3)	1
Machine Shop		
Military or Air Science	(0-3)	1
Physics 203	(4-3)	5
General Physics		
Physical Education 201	(0-2)	R
		19

Second Semester		Credit
Business Administration 305	(3-0)	3
Business Law		
Industrial Engineering 202	(2-0)	2
Introduction to Industrial Engineering		
Mathematics 210	(3-0)	3
Calculus		
Mechanical Engineering 202	(0-3)	1
Welding and Foundry		
Mechanical Engineering 212	(3-0)	3
Engineering Mechanics		
Mechanical Engineering 310	(0-3)	1
Machine Shop		
Military or Air Science	(0-3)	1
Physics 204	(4-3)	5
General Physics		
Physical Education 202	(0-2)	R
		19

JUNIOR YEAR

Business Administration 409	(3-0)	3
Survey of Accounting Principles		
Civil Engineering 305	(3-0)	3
Mechanics of Materials		
Electrical Engineering 307	(3-3)	4
Electrical Circuits		
Industrial Engineering 302	(1-2)	2
Production Engineering		
Mechanical Engineering 313	(3-0)	3
Engineering Mechanics		
Elective		3
		18

Business Administration 430	(3-0)	3
Cost Accounting Survey		
Civil Engineering 315	(0-2)	1
Strength of Materials Laboratory		
Electrical Engineering 308	(3-3)	4
Electrical Machinery		
Industrial Engineering 404	(2-3)	3
Motion and Time Study		
Mechanical Engineering 323	(4-0)	4
Thermodynamics		
Elective		3
		18

SENIOR YEAR

English 401	(0-2)	1
Public Speaking		
Industrial Engineering 411	(3-0)	3
Wage and Salary Control		
Industrial Engineering 414	(2-3)	3
Statistical Control of Quality		
Industrial Engineering 415	(1-3)	2
Production Control		
Industrial Engineering 451	(2-0)	2
Tool Engineering		
Mechanical Engineering 337	(0-3)	1
Kinematic Drawing		
Mechanical Engineering 440	(2-3)	3
Physical Metallurgy		
Elective		3
		18

English 301	(3-0)	3
Writing for Professional Men		
Industrial Engineering 408	(0-2)	1
Seminar		
Industrial Engineering 412	(3-0)	3
Labor and Industry		
Industrial Engineering 416	(1-6)	3
Factory Layout		
Industrial Engineering 452	(0-3)	1
Tool Design Laboratory		
Approved Elective		5
Elective		3
		19

For the Class Graduating in 1954-55
SENIOR YEAR

First Semester		Credit
English 401 Public Speaking	(0-2)	1
Industrial Engineering 404 Motion and Time Study	(2-3)	3
Industrial Engineering 411 Wage and Salary Control	(3-0)	3
Industrial Engineering 414 Statistical Control of Quality	(2-3)	3
Industrial Engineering 415 Production Control	(1-3)	2
Industrial Engineering 451 Tool Engineering	(2-0)	2
Elective		3
		17

Second Semester		Credit
English 301 Writing for Professional Men	(3-0)	3
Industrial Engineering 408 Seminar	(0-2)	1
Industrial Engineering 412 Labor and Industry	(3-0)	3
Industrial Engineering 416 Factory Layout	(1-6)	3
Industrial Engineering 452 Tool Design Laboratory	(0-3)	1
Approved Elective		6
Elective		3
		20

Approved Electives for INDUSTRIAL ENGINEERING

The student should observe that these electives may be used for obtaining a better background in (1) statistics, (2) accounting, (3) economics, (4) human relations (from psychology, genetics, labor problems, English), (5) English, or (6) history. Some technical subjects are available for those so inclined.

Business Administration 303 Statistical Method	(3-3)	4
Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 316 Office Management	(2-0)	2
Business Administration 418 Corporation Finance	(3-0)	3
Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Business Administration 446 Marketing Industrial Products	(2-0)	2
Business Administration 604 Statistics	(3-2)	4
Civil Engineering 311 Hydraulics	(3-0)	3
Civil Engineering 408 Municipal Administration	(3-0)	3
Civil Engineering 473 Cost Estimating	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
Economics 318 Economics of Labor	(3-0)	3
Economics 421 Government and Business	(3-0)	3
Electrical Engineering 320 Electronics	(3-3)	4
Electrical Engineering 420 Servo-Mechanisms and Control Devices	(3-0)	3
Electrical Engineering 436 Electrical Equipment for Buildings	(3-0)	3
History 318 International Developments Since 1918	(3-0)	3
History 322 Industrial History of the United States	(3-0)	3
Industrial Education 328 Industrial Accident Prevention	(3-0)	3
Industrial Engineering 405 Industrial Case Analysis	(1-0)	1
Industrial Engineering 406 Industrial Case Analysis	(1-0)	1
Industrial Engineering 420 Manufacturing Costs	(3-0)	3
Industrial Engineering 430 Special Problems in Industrial Engineering		1 to 3
Industrial Engineering 431 Special Problems in Industrial Engineering		1 to 3
Journalism 304 Feature Story Writing	(2-2)	3
Journalism 321 Industrial Journalism	(2-2)	3
Journalism 406 Publicity and Public Relations	(3-0)	3
Mathematics 307 Calculus	(3-0)	3
Mathematics 411 Mathematical Probability	(3-0)	3
***Mechanical Engineering 338** Kinematics and Machine Design	(2-3)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Mechanical Engineering 436 Heating, Ventilating, and Air Conditioning	(3-0)	3
Mechanical Engineering 438 Marketing Industrial Products	(3-0)	3
Mechanical Engineering 445 Machine Design	(2-3)	3
Mechanical Engineering 446 Machine Design	(2-3)	3
Mechanical Engineering 455 Applied Welding Technology	(2-3)	3
Psychology 303 Psychology for Technical Students	(3-0)	3
Psychology 401 Industrial Psychology	(3-0)	3

*May be substituted for Mechanical Engineering 337 and approved elective.

Curriculum in INDUSTRIAL MANAGEMENT

(This is an option in Industrial Engineering leading to the degree of Bachelor of Science in Industrial Engineering. It is to be taken by a selected group of students and is to be followed by a fifth year leading to a Master's degree.)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

(Same as for Industrial Engineering, page 208)

JUNIOR YEAR

First Semester		Credit
Business Administration 409 Survey of Accounting Principles	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Economics 323 Economic Analysis	(3-0)	3
Electrical Engineering 307 Electrical Circuits	(3-3)	4
Industrial Engineering 302 Production Engineering	(1-2)	2
***Elective**		3
		18

Second Semester		Credit
Business Administration 205 Marketing	(3-0)	3
Business Administration 430 Cost Accounting Survey	(3-0)	3
Civil Engineering 315 Strength of Materials Laboratory	(0-2)	1
Economics 311 Money and Banking	(3-0)	3
Electrical Engineering 308 Electrical Machinery	(3-3)	4
Industrial Engineering 404 Motion and Time Study	(2-3)	3
***Elective**		3
		20

SENIOR YEAR

English 401 Public Speaking	(0-2)	1
Industrial Engineering 411 Wage and Salary Control	(3-0)	3
Industrial Engineering 414 Statistical Control of Quality	(2-3)	3
Industrial Engineering 415 Production Control	(1-3)	2
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Mechanical Engineering 337 Kinematic Drawing	(0-3)	1
***Elective**		3
		20

English 301 Writing for Professional Men	(3-0)	3
Industrial Education 328 Industrial Accident Prevention	(3-0)	3
Industrial Engineering 408 Seminar	(0-2)	1
Industrial Engineering 412 Labor and Industry	(3-0)	3
Industrial Engineering 416 Factory Layout	(1-6)	3
Psychology 401 Industrial Psychology	(3-0)	3
***Elective**		3
		19

*Students not electing advanced ROTC should choose their electives from the list of approved electives for industrial engineering shown on page 209.

Five-Year Courses Leading to BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING AND BACHELOR OF SCIENCE IN ANY OTHER BRANCH OF ENGINEERING

Those students who wish to secure two degrees in engineering, one of which is Bachelor of Science in Industrial Engineering, should fulfill the requirements stated below. A program of study should be planned early with prerequisites in mind. Students are advised to start on their industrial engineering courses during the fourth year and to complete the required shop courses before the beginning of the fifth year.

All electives are to be from the list of approved electives for industrial engineering or are to be approved by the Dean of Engineering.

Five-Year Curricula in INDUSTRIAL ENGINEERING and AERONAUTICAL ENGINEERING

INDUSTRIAL ENGINEERING and CHEMICAL ENGINEERING

INDUSTRIAL ENGINEERING and CIVIL ENGINEERING

INDUSTRIAL ENGINEERING and ELECTRICAL ENGINEERING

INDUSTRIAL ENGINEERING and PETROLEUM ENGINEERING

For the student to earn the two degrees, Bachelor of Science in Industrial Engineering and Bachelor of Science in one of the foregoing branches of engineering, he should complete the requirements specified in this catalogue for aeronautical, chemical, civil, electrical, or petroleum engineering and complete a minimum of 37 additional credit hours, which must include those courses listed below:

Business Administration 409 Survey of Accounting Principles	(3-0)	3
Business Administration 430 Cost Accounting Survey	(3-0)	3
Industrial Engineering 202 Introduction to Industrial Engineering	(2-0)	2
Industrial Engineering 302 Production Engineering	(1-2)	2
Industrial Engineering 404 Motion and Time Study	(2-3)	3
Industrial Engineering 408 Seminar	(0-2)	1
Industrial Engineering 411 Wage and Salary Control	(3-0)	3
Industrial Engineering 414 Statistical Control of Quality	(2-3)	3
Industrial Engineering 415 Production Control	(1-3)	2

Other required courses for students in:

Aeronautical Engineering: Business Administration 305; Industrial Engineering 416, 451, 452; Mechanical Engineering 202, 310, 440.

Chemical Engineering: Business Administration 305; Economics 403; Mechanical Engineering 201, 202, 309, 310, 313.

Civil Engineering: Business Administration 305; Mechanical Engineering 201, 202, 309, 310, 313, 440.

Electrical Engineering: Industrial Engineering 416, 451, 452; Mechanical Engineering 201, 202, 309, 310, 440.

Petroleum Engineering: Business Administration 305; Economics 403; English 301; Mechanical Engineer- 201, 202, 310.

Five-Year Curricula in INDUSTRIAL ENGINEERING and MECHANICAL ENGINEERING

For the student to earn the two degrees, Bachelor of Science in Industrial Engineering and Bachelor of Science in Mechanical Engineering, he should complete the requirements specified in this catalogue for mechanical engineering and complete a minimum of 37 additional credit hours, which must include those courses listed below:

Business Administration 430 Cost Accounting Survey	(3-0)	3
Industrial Engineering 302 Production Engineering	(1-2)	2
Industrial Engineering 404 Motion and Time Study	(2-3)	3
Industrial Engineering 408 Seminar	(0-2)	1
Industrial Engineering 411 Wage and Salary Control	(3-0)	3
Industrial Engineering 412 Labor and Industry	(3-0)	3
Industrial Engineering 414 Statistical Control of Quality	(2-3)	3
Industrial Engineering 415 Production Control	(1-3)	2
Industrial Engineering 416 Factory Layout	(1-6)	3
Industrial Engineering 420 Manufacturing Costs	(3-0)	3
Industrial Engineering 451 Tool Engineering	(2-0)	2
Industrial Engineering 452 Tool Design Laboratory	(0-3)	1
***Approved Elective**		7

*Should include Mechanical Engineering 440 if the student has not already had it.

Curriculum in MECHANICAL ENGINEERING

(Steam Power, Internal Combustion Engines, Automotive, Refrigerating, Heating, Ventilating, Air Conditioning, Physical Metallurgy, and Machine Design)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Civil Engineering 206 Plane Surveying	(0-3)	1
Economics 205 Principles of Economics	(3-0)	3
History 306 American National Government	(3-0)	3
Mathematics 209 Calculus	(3-0)	3
Mechanical Engineering 201 Welding and Foundry	(0-3)	1
Mechanical Engineering 309 Machine Shop	(0-3)	1
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Business Administration 305 Business Law	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Mathematics 210 Calculus	(3-0)	3
Mechanical Engineering 202 Welding and Foundry	(0-3)	1
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Mechanical Engineering 310 Machine Shop	(0-3)	1
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		19

JUNIOR YEAR

Civil Engineering 305 Mechanics of Materials	(3-0)	3
Electrical Engineering 307 Electrical Circuits	(3-3)	4
Mathematics 308 Differential Equations	(3-0)	3
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Mechanical Engineering 327 Thermodynamics	(3-0)	3
Elective		3
		19

Electrical Engineering 308 Electrical Machinery	(3-3)	4
Mechanical Engineering 328 Thermodynamics	(3-0)	3
Mechanical Engineering 338 Kinematics and Machine Design	(2-3)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Mechanical Engineering 440 Physical Metallurgy	(2-3)	3
Elective		3
		19

SENIOR YEAR

English 301 Writing for Professional Men	(3-0)	3
English 401 Public Speaking	(0-2)	1
Industrial Engineering 401 Survey of Industrial Engineering	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Mechanical Engineering 445 Machine Design	(2-3)	3
Mechanical Engineering 449 Seminar	(0-2)	1
Technical Elective		3
Elective		3
		19

Business Administration 409 Survey of Accounting Principles	(3-0)	3
Mechanical Engineering 404 Engineering Laboratory	(1-3)	2
Mechanical Engineering 417 Power Engineering	(4-0)	4
Mechanical Engineering 446 Machine Design	(2-3)	3
Mechanical Engineering 450 Seminar	(0-2)	1
Technical Elective		3
Elective		3
		19

Technical Electives for MECHANICAL ENGINEERING

Industrial Engineering 404 Motion and Time Study	(2-3)	3
Mathematics 307 Calculus	(3-0)	3
Mechanical Engineering 407 Mechanical Refrigeration	(3-0)	3
Mechanical Engineering 410 Internal Combustion Engines	(3-0)	3
Mechanical Engineering 457 Engineering Analysis	(3-0)	3
Mechanical Engineering 459 Mechanical Vibration	(3-0)	3
Mechanical Engineering 412 Advanced Problems in Mechanical Engineering		2 to 5
Mechanical Engineering 414 Steam and Gas Turbines	(2-3)	3
Mechanical Engineering 432 Automotive Engineering	(3-0)	3
Mechanical Engineering 436 Heating, Ventilating, and Air Conditioning	(3-0)	3
Mechanical Engineering 455 Applied Welding Technology	(2-3)	3

Four-Year Curriculum in PETROLEUM ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses).

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester	Credit
Chemistry 207 Elementary Quantitative Analysis (2-3)	3
Geology 201 General Geology (3-0)	3
Geology 207 Mineralogy and Rock Study (2-6)	4
Mathematics 209 Calculus (3-0)	3
Military or Air Science (0-3)	1
Physics 203 General Physics (4-3)	5
Physical Education 201 (0-2)	R
	19

Second Semester	Credit
Civil Engineering 208 Topographic Surveying (1-3)	2
Geology 210 Historical Geology (3-3)	4
Mathematics 210 Calculus (3-0)	3
Mechanical Engineering 212 Engineering Mechanics (3-0)	3
Military or Air Science (0-3)	1
Physics 204 General Physics (4-3)	5
Physical Education 202 (0-2)	R
	18

JUNIOR YEAR

Chemistry 225 Elementary Organic Chemistry	(3-0)	3
English 207 Report Writing and Correspondence	(2-0)	2
Geology 311 Petroleum and Structural Geology	(3-3)	4
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		20

Chemistry 344 Physical Chemistry	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
***Elective**		3
		19

*Students not electing advanced ROTC will register for Economics 403.

SENIOR YEAR

First Semester		Credit
Electrical Engineering 305 Electrical Machinery	(3-3)	4
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
Elective		3
		19

Second Semester		Credit
English 401 Public Speaking	(0-2)	1
History 306 American National Government	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
Elective		3
		19

Five-Year Curriculum in PETROLEUM ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

(See page 214)

JUNIOR YEAR

Chemistry 225 Elementary Organic Chemistry	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Mathematics 307 Calculus	(3-0)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		18

Chemistry 344 Physical Chemistry	(3-0)	3
English 210 Writing and Discussion	(2-0)	2
Mathematics 308 Differential Equations	(3-0)	3
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3
		19

SENIOR YEAR

First Semester		Credit
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Civil Engineering 315 Strength of Materials Laboratory	(0-2)	1
Geology 311 Petroleum and Structural Geology	(3-3)	4
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Elective		3
		18

Second Semester		Credit
Business Administration 305 Business Law	(3-0)	3
English 403 Speaking for Professional Men	(1-2)	2
History 306 American National Government	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Psychology 303 Psychology for Technical Students	(3-0)	3
Elective		3
		18

FIFTH YEAR

Economics 403 Principles of Economics	(3-0)	3
English 301 Writing for Professional Men	(3-0)	3
Geography 401 International Political Geography	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
		19

Business Administration 409 Survey of Accounting Principles	(3-0)	3
Economics 319 Economic Development of the United States	(3-0)	3
Electrical Engineering 305 Electrical Machinery	(3-3)	4
History 325 Trends in American History	(3-0)	3
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
		19

NOTE: The following electives are particularly recommended:

Business Administration 306 Business Law	(3-0)	3
Geography 201 Principles of Geography	(3-0)	3

Five-Year Curriculum in PETROLEUM ENGINEERING—GENERAL BUSINESS

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

Chemistry 207 Elementary Quantitative Analysis	(2-3)	3
Economics 205 Principles of Economics	(3-0)	3
English 203 Composition and Literature	(2-0)	2
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		17

Business Administration 303 Statistical Method	(3-3)	4
Civil Engineering 208 Topographic Surveying	(1-3)	2
Mathematics 210 Calculus	(3-0)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		18

SUMMER

First Term		Credit
Business Administration 205 Marketing	(9-0)	3
Business Administration 227 Principles of Accounting	(9-9)	4
		7

Second Term		Credit
Business Administration 228 Principles of Accounting	(9-9)	4
History 306 American National Government	(9-0)	3
		7

JUNIOR YEAR

First Semester		Credit
Chemistry 225 Elementary Organic Chemistry	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Geology 201 General Geology	(3-0)	3
Geology 207 Mineralogy and Rock Study	(2-6)	4
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Elective		3
		19

Second Semester		Credit
Business Administration 305 Business Law	(3-0)	3
Chemistry 344 Physical Chemistry	(3-0)	3
Electrical Engineering 305 Electrical Machinery	(3-3)	4
Geology 210 Historical Geology	(3-3)	4
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Elective		3
		20

SENIOR YEAR

Business Administration 329 Cost Accounting	(3-0)	3
English 207 Report Writing and Correspondence	(2-0)	2
Geology 311 Petroleum and Structural Geology	(3-3)	4
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		20

Business Administration 304 Business Cycles and Business Measurements	(3-0)	3
Business Administration 306 Business Law	(3-0)	3
Business Administration 315 Insurance	(3-0)	3
Economics 311 Money and Banking	(3-0)	3
English 401 Public Speaking	(0-2)	1
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3
		20

FIFTH YEAR

Business Administration 310 Credit and Collections	(2-0)	2
Business Administration 418 Corporation Finance	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
		19

Business Administration 420 Principles of Investment	(3-0)	3
Business Administration 422 Personnel Problems of Industry	(3-0)	3
Business Administration 435 Salesmanship	(3-0)	3
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
		19

NOTE: Students who cannot schedule Economics 205 in the sophomore year should schedule Economics 403 in the junior or senior year.

Five-Year Curriculum in PETROLEUM ENGINEERING— CHEMICAL ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit
Chemistry 205 Qualitative Analysis	(2-6)	4
English 203 Composition and Literature	(2-0)	2
History 306 American National Government	(3-0)	3
Mathematics 209 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemical Engineering 204 Elementary Chemical Engineering	(3-0)	3
Chemistry 216 Quantitative Analysis	(2-6)	4
English 210 Writing and Discussion	(2-0)	2
Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1
Physics 204 General Physics	(4-3)	5
Physical Education 202	(0-2)	R
		18

SUMMER

First Term		Credit
Civil Engineering 208 Topographic Surveying	(3-9)	2
Mechanical Engineering 212 Engineering Mechanics	(9-0)	3
		5

Second Term		Credit
Civil Engineering 305 Mechanics of Materials	(9-0)	3
Mechanical Engineering 313 Engineering Mechanics	(9-0)	3
		6

JUNIOR YEAR

First Semester		Credit
Chemical Engineering 304 Unit Operations	(3-0)	3
Chemistry 301 Organic Chemistry	(3-3)	4
Chemistry 323 Physical Chemistry	(3-3)	4
Geology 201 General Geology	(3-0)	3
Geology 207 Mineralogy and Rock Study	(2-6)	4
***Elective**		3
		21

Second Semester		Credit
Chemical Engineering 314 Unit Operations Laboratory	(0-3)	1
Chemical Engineering 423 Unit Operations	(3-0)	3
Chemistry 302 Organic Chemistry	(3-3)	4
Chemistry 324 Physical Chemistry	(3-3)	4
English 401 Public Speaking	(0-2)	1
Geology 210 Historical Geology	(3-3)	4
Elective		3
		20

SENIOR YEAR

Chemical Engineering 433 Unit Operations Laboratory	(0-3)	1
Chemical Engineering 441 Chemical Engineering Unit Processes	(3-0)	3
Chemical Engineering 461 Process Control and Instrumentation	(2-0)	2
Geology 311 Petroleum and Structural Geology	(3-3)	4
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		20

Chemical Engineering 426 Plant Design	(2-6)	4
Electrical Engineering 305 Electrical Machinery	(3-3)	4
Mechanical Engineering 323 Thermodynamics	(4-0)	4
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3
		19

FIFTH YEAR

Chemical Engineering 409 Oil and Gas Technology	(3-0)	3
Chemical Engineering 429 Oil and Gas Technology Laboratory	(0-3)	1
Chemical Engineering 438 Seminar	(1-0)	1
Chemical Engineering 454 Chemical Engineering Thermodynamics	(3-0)	3
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
		20

Chemical Engineering 428 Industrial Chemical Processes	(3-0)	3
Chemical Engineering 464 Chemical Engineering Kinetics	(3-0)	3
Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
		18

*Students not electing advanced ROTC will register for Economics 403.

Five-Year Curriculum in PETROLEUM ENGINEERING— GEOLOGICAL ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses)

FRESHMAN YEAR

(See page 188)

SOPHOMORE YEAR

First Semester		Credit	Second Semester		Credit
English 203 Composition and Literature	(2-0)	2	Chemistry 207 Elementary Quantitative Analysis	(2-3)	3
Geology 201 General Geology	(3-0)	3	Civil Engineering 208 Topographic Surveying	(1-3)	2
Geology 203 Crystallography and Mineralogy	(2-6)	4	Geology 204 Mineralogy and Rock Study	(1-3)	2
Geology 209 Introduction to Field Work	(0-3)	1	Geology 210 Historical Geology	(3-3)	4
Mathematics 209 Calculus	(3-0)	3	Mathematics 210 Calculus	(3-0)	3
Military or Air Science	(0-3)	1	Military or Air Science	(0-3)	1
Physics 203 General Physics	(4-3)	5	Physics 204 General Physics	(4-3)	5
Physical Education 201	(0-2)	R	Physical Education 202	(0-2)	R
		19			20

JUNIOR YEAR

Chemistry 225 Elementary Organic Chemistry	(3-0)	3	Chemistry 344 Physical Chemistry	(3-0)	3
Geology 305 Invertebrate Paleontology	(3-3)	4	Civil Engineering 305 Mechanics of Materials	(3-0)	3
Geology 315 Principles of Sedimentation	(2-3)	3	Economics 403 Principles of Economics	(3-0)	3
Mechanical Engineering 212 Engineering Mechanics	(3-0)	3	English 401 Public Speaking	(0-2)	1
Elective		5	Geology 306 Stratigraphy	(3-3)	4
		18	Elective		3
					17

SENIOR YEAR

English 207 Report Writing and Correspondence	(2-0)	2	Electrical Engineering 305 Electrical Machinery	(3-3)	4
History 366 American National Government	(3-0)	3	Geology 312 Structural Geology	(2-3)	3
Mechanical Engineering 323 Thermodynamics	(4-0)	4	Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3	Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Petroleum Engineering 305 Petroleum Development	(3-0)	3	Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1	Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3	Elective		3
		19			19

SUMMER CAMP

Geology 300, Field Geology, credit 6.

FIFTH YEAR

First Semester	Credit	Second Semester	Credit
Geology 404 (2-3) Geology of Petroleum	3	**Geology 425** (2-3) Subsurface Geology	3
Geology 449 (1-0) Seminar	1	**Geology 433** (0-6) Field Geology	2
Petroleum Engineering 405 (2-2) Equipment and Applications	3	**Geology 450** (1-0) Seminar	1
Petroleum Engineering 409 (1-3) Subsurface Engineering	2	**Petroleum Engineering 402** (3-0) Petroleum Production Economics	3
Petroleum Engineering 413 (2-2) Natural Gas Engineering	3	**Petroleum Engineering 414** (3-0) Oil Measurements and Transportation	3
Petroleum Engineering 415 (0-3) Gas Measurement Laboratory	1	**Petroleum Engineering 416** (0-3) Oil Measurements and Transportation Laboratory	1
Petroleum Engineering 428 (3-0) Reservoir Engineering	3	**Petroleum Engineering 438** (3-0) Secondary Recovery Methods	3
Elective	3	**Elective**	3
	19		19

Five-Year Curriculum in PETROLEUM ENGINEERING— MECHANICAL ENGINEERING

(A minimum of six weeks of approved experience in oil field operations or Petroleum Engineering 300 required for registration in senior Petroleum Engineering courses)

FRESHMAN YEAR

SOPHOMORE YEAR

(See page 188)

Chemistry 207 (2-3) Elementary Quantitative Analysis	3	**Economics 205** (3-0) Principles of Economics	3
Civil Engineering 208 (1-3) Topographic Surveying	2	**History 306** (3-0) American National Government	3
English 203 (2-0) Composition and Literature	2	**Mathematics 210** (3-0) Calculus	3
Mathematics 209 (3-0) Calculus	3	**Mechanical Engineering 202** (0-3) Welding and Foundry	1
Mechanical Engineering 201 (0-3) Welding and Foundry	1	**Mechanical Engineering 212** (3-0) Engineering Mechanics	3
Mechanical Engineering 309 (0-3) Machine Shop	1	**Mechanical Engineering 310** (0-3) Machine Shop	1
Military or Air Science (0-3)	1	**Military or Air Science** (0-3)	1
Physics 203 (4-3) General Physics	5	**Physics 204** (4-3) General Physics	5
Physical Education 201 (0-2)	R	**Physical Education 202** (0-2)	R
	18		20

JUNIOR YEAR

First Semester		Credit
Chemistry 225 Elementary Organic Chemistry	(3-0)	3
Geology 201 General Geology	(3-0)	3
Geology 207 Mineralogy and Rock Study	(2-6)	4
Mathematics 308 Differential Equations	(3-0)	3
Mechanical Engineering 313 Engineering Mechanics	(3-0)	3
Elective		3
		19

Second Semester		Credit
Chemistry 344 Physical Chemistry	(3-0)	3
Civil Engineering 305 Mechanics of Materials	(3-0)	3
Geology 210 Historical Geology	(3-3)	4
Mechanical Engineering 327 Thermodynamics	(3-0)	3
Mechanical Engineering 440 Physical Metallurgy	(2-3)	3
Elective		3
		19

SENIOR YEAR

Electrical Engineering 307 Electrical Circuits	(3-3)	4
English 207 Report Writing and Correspondence	(2-0)	2
Geology 311 Petroleum and Structural Geology	(3-3)	4
Mechanical Engineering 344 Fluid Mechanics	(3-0)	3
Petroleum Engineering 305 Petroleum Development	(3-0)	3
Petroleum Engineering 307 Petroleum Development Laboratory	(0-3)	1
Elective		3
		20

Electrical Engineering 308 Electrical Machinery	(3-3)	4
Industrial Engineering 401 Survey of Industrial Engineering	(3-0)	3
Mechanical Engineering 328 Thermodynamics	(3-0)	3
Mechanical Engineering 338 Kinematics and Machine Design	(2-3)	3
Petroleum Engineering 306 Petroleum Production Methods	(3-0)	3
Petroleum Engineering 308 Petroleum Production Laboratory	(0-3)	1
Elective		3
		20

FIFTH YEAR

Mechanical Engineering 403 Engineering Laboratory	(1-3)	2
Mechanical Engineering 417 Power Engineering	(4-0)	4
Mechanical Engineering 445 Machine Design	(2-3)	3
Petroleum Engineering 405 Equipment and Applications	(2-2)	3
Petroleum Engineering 409 Subsurface Engineering	(1-3)	2
Petroleum Engineering 413 Natural Gas Engineering	(2-2)	3
Petroleum Engineering 415 Gas Measurement Laboratory	(0-3)	1
Petroleum Engineering 428 Reservoir Engineering	(3-0)	3
		21

Business Administration 409 Survey of Accounting Principles	(3-0)	3
English 401 Public Speaking	(0-2)	1
Mechanical Engineering 404 Engineering Laboratory	(1-3)	2
Mechanical Engineering 446 Machine Design	(2-3)	3
Petroleum Engineering 402 Petroleum Production Economics	(3-0)	3
Petroleum Engineering 414 Oil Measurements and Transportation	(3-0)	3
Petroleum Engineering 416 Oil Measurements and Transportation Laboratory	(0-3)	1
Petroleum Engineering 438 Secondary Recovery Methods	(3-0)	3
		19

NOTE: Students who cannot schedule Economics 205 in the sophomore year should schedule Economics 403 in the junior or senior year.

General Electives in ENGINEERING

Students with the proper prerequisites may choose their general electives from the list below. Those desiring to elect courses not listed must secure the written approval of the Dean of Engineering.

1. Administration 301, 304; Aeronautical Engineering 201; Agricultural Engineering 324, 410, 418, 428, 430; Architecture 329, 330, 429, 430; English 212, 231, 232; Geology 201; Industrial Education 328; Industrial Engineering 401, 411, 412; Journalism 304, 321, 406; Landscape Architecture 308, 310, 411; Oceanography 401; Petroleum Engineering 204; Rural Sociology 205, 206, 311, 314.
2. Any junior or senior courses offered by the Departments of Air Science and Tactics, Economics, English, History, Mathematics, Military Science and Tactics, and Physics.
3. Any sophomore, junior, or senior courses offered by the Departments of Business Administration, Chemistry, Geography, and Psychology.
4. Biology: Any course, but not more than 7 hours of freshman courses.
5. Modern Languages: Any course, but credit in the beginning course in a modern language is allowed only after satisfactory completion of both semesters. No credit is given for a foreign language that is equivalent to that taken in high school.
6. Religious Education: Any course, but not more than 4 semester hours may be counted.

THE SCHOOL OF MILITARY SCIENCE

The participation of our government in foreign affairs makes it apparent that every young American must recognize his obligation for service to his country and should realize the necessity for coordination of his military and civilian careers. The Army and Air Force ROTC courses supplement the student's civilian curriculum and offer him the opportunity of planning his civilian and military careers on a mutually supporting basis.

In the words of President Eisenhower, "ROTC is a ready-made course, designed and perfected to develop the qualities of leadership required in both military and civil enterprise."

The Agricultural and Mechanical College of Texas offers ROTC instruction in eleven Army branches and the Air Force, the most diversified military curriculum of any American college or university.

AIR SCIENCE

The United States Air Force is recognized as this country's first line of defense and, thereby, as a deterrent to any attack upon this country by another power. The capability of instantaneous and devastating retaliatory action is necessary in the maintenance of peaceful relations with aggressive warlike powers. The airplane has become the vehicle for delivery of such potent destructive power as to tax the imagination. The destructive power that can be delivered by a single airplane places the key role of the defense of this nation upon the pilot and the air crew. The mission of the Air Force ROTC program is dedicated chiefly to the pre-flight training of future air crew members. The progress of engineering and scientific development in the Air Force also requires a limited number of potential officers who can prove themselves outstanding in these fields. Therefore, a limited number of cadets are selected for advanced ROTC training who are interested in further training in these fields.

While the four-year ROTC course normally leads to a reserve commission, cadets will have the opportunity to apply for commissions in the Regular Air Force upon the completion of 18 months active duty. Achievement of the honor of Distinguished Military Graduate will enhance the possibility of securing a regular commission.

Basic Air Science, comprising the first and second years of instruction, consists of 180 contact hours, with academic credit of 1 hour per semester.

Advanced Air Science consists of 300 contact hours in the third and fourth college years with academic credit of three hours per semester. Advanced course students are required to attend a four-week summer camp between their third and fourth college years.

The Air Science program consists of a generalized course of study designed to select and prepare students, through a permanent program of instruction, to serve as officers in the Regular and Reserve components of the United States Air Force. It provides the fundamental training, both personal and professional, to develop the attributes of a leader which will prove of long range value to the cadet and to the Air Force, whether he returns to civilian life or becomes a regular Air Force officer.

MILITARY SCIENCE

While the four-year ROTC course normally leads to a reserve commission, the Army relies upon this source for large numbers of their regular officers. Under the Distinguished Military Graduate program of the Army, interested cadets who are outstanding in military aptitude and academic proficiency may apply during their senior year for a regular commission to be tendered upon graduation.

The Army Combat Arms

The mission of the entire Army is to support the fighting teams on the battle lines—the men who get there first. These teams are made up of infantry, armor, and artillery. These are the raison d'etre of the Army—highly trained in specialties which can be learned nowhere but in the Army and its training units such as the ROTC.

The young officer who aims for a career in one of the combat arms will follow in the footsteps of many illustrious Americans. He will command greatest respect at every Army gathering. His training, more than any other, fits him for high commands and positions of great responsibility. Most of the top men in the Army today have risen through one of the combat arms.

Infantry

Post-World War II hostilities have illustrated again that the infantry officer is the key to success in battle. He is the bulwark of Americanism whose steadfastness is the true measure of our national security.

As the lives of our fighting men are more highly valued than the equipment of war, competent leadership is imperative. To meet this need, the U. S. Infantry officer has developed throughout our history to his present status of personnel management specialist. Toward that end he undergoes a career-long balanced program of training that includes fine service schools and the best civilian colleges, as well as service in both command and staff capacities.

Important to all officers, the qualities of intelligence, manly fortitude, and physical endurance are imperative in an infantry officer. These qualities, rather than a particular academic course, are the qualifications of an infantry enrollee; he must prepare himself to be the Army's "jack-of-all-missions" without whom no mission of major importance can succeed.

Field Artillery

The Field Artillery, one of the combat arms, is the principal agency of ground fire support. It is equipped with mobile cannon, rockets, guided missiles and equipment required for fire control, movement, observation, and communication.

It gives depth to combat and isolates the battlefield by counterfire, by fire on hostile reserves, by restricting movement in the rear areas, and by disrupting hostile command facilities and other installations.

The efficient exploitation of Field Artillery capabilities depends upon control, liaison, communications, observation, location and evaluation of targets, survey control and logistical support.

According to weight and caliber, Field Artillery cannons are classified as light, medium, heavy, and very heavy weapons. Self-propelled versions are given the same classification as their towed counterpart. Today the Artillery has gained its place in the Modern Age by the advent of the 280mm atomic gun and the guided missile battalion.

No special academic course is necessary for enrollment in the Field Artillery branch.

Armor

Armor is primarily a combat arm with characteristics and capabilities designed for offensive action. It is an arm of mobility, armor-protected fire power, and shock action. It uses its mobility in exploitation of combat successes, in pur-

suit of a fleeing enemy, in seizing objectives deep in enemy rear areas, in reconnoitering over broad frontages, and providing depth and a wide radius of action in defense. Armor concentrates its fire power at the decisive area of action to lead, accompany, or support Infantry in the penetration of enemy defenses, and to destroy enemy counter attacks. It utilizes its shock action to close with and destroy the enemy. Armor is massed in close coordination with other arms and is supported by the tactical Air Force.

The weapons of armored units include tanks, self-propelled guns and howitzers, machine guns, mortars, rocket launchers, submachine guns, carbines, pistols, rifles, bayonets, automatic rifles, and grenades. Of these, the tank is the principal weapon.

Army ground reconnaissance usually is performed by light armored units which employ rapidity and flexibility of movement, communication facilities, and fire power. The capabilities of light armored units include both distant and close ground reconnaissance, counter-reconnaissance, seizing and holding critical terrain features for a limited time, march and battlefield security, flank security, combat liaison, and delaying and harassing action.

No special academic course is necessary for enrollment in armor.

Antiaircraft Artillery

The Antiaircraft Artillery is that part of the United States Army which attacks hostile forces in the air, on the land, and on the sea.

The activities of antiaircraft artillerymen range from the mobile, hard-hitting automatic weapons units with the Infantry and Armored Divisions to the heavy gun units and guided missile installations employed to attack enemy targets beyond the reach of other weapons.

The weapons of the antiaircraft artillerymen include 50 caliber machine guns, 40mm automatic cannon, 75mm, 90mm and 120mm guns, and guided missiles. Some of the latest scientific advancements are used along with these weapons. These include electronically operated fuses which cause projectiles to explode at or near targets, radar and other electronic equipment for automatically locating and tracking targets, computing firing data, and instantaneously positioning guns by remote control, thereby permitting effective fire to be delivered at either seen or unseen aerial targets.

With the advent of rockets and guided missiles, an even wider field is being opened for the Antiaircraft Artillery. Varieties of rockets and guided missiles have been developed for the use of the Antiaircraft Artillery in coping with the higher speeds and altitudes of modern aircraft and greater ranges to ground targets. The field is open for employment of electronic equipment which will cause rockets to locate and automatically direct themselves to targets at extremely high altitudes, speeds, and ranges.

The weapons and equipment of the Antiaircraft Artillery offer a wide appeal to the individual interested in the fields of science and engineering. No special academic course is necessary for admission to this branch.

The Army Services

Behind the man with the gun there has always been and always must be a group of highly specialized administrators, technicians, and scientists. It is their responsibility to see that the cutting edge of the sword is ready, strong, and keen. These are the men of the services.

The Corps of Engineers

The Corps of Engineers is primarily a combat arm but has in addition a service function and a civil mission.

In combat the Engineers increase the power of our combat forces by facilitating the movement of friendly forces and impeding the movement of enemy forces through construction and destruction efforts. Engineer troops are often used as infantry in emergency situations.

The service function of the Corps of Engineers includes the construction of army-wide training facilities, cantonments, and other administrative structures. They also supply engineer equipment and material for all branches of the army.

The civil works function of the Corps of Engineers is supervised directly by the Congress of the United States and includes river and harbor development, flood control, canals, dams, and relief work in disaster areas.

Noted projects of the Corps of Engineers include the Panama Canal, Ledo Road, Library of Congress, and the Alcan Highway, as well as the flood control works on the major river systems of the United States.

Students pursuing any course of instruction leading to an engineering, technical, or scientific degree are eligible to

enroll in the advanced engineer ROTC provided they meet the college academic requirements.

The Chemical Corps

The Chemical Corps is charged with the investigation, research, design, and development of chemical, biological, and radiological warfare items. It is concerned with smoke and incendiary materials, toxic gases, all war gas defense appliances, and biological warfare and radiological defense activities. It furnishes advice to all elements of the Department of Defense on chemical and biological warfare and radiological defense. It is responsible for the supervision of training of the army in chemical and biological warfare and radiological defense.

The Quartermaster Corps

One of the world's largest business organizations, the Quartermaster Corps supplies over 70,000 items to a million men all over the globe; and in time of war this may be expanded to 85,000 items to ten million men.

Quartermaster officers of outstanding executive caliber and of potentially sound business sense design, produce, test, and supply clothing for every climate, food for every mealtime situation, and petroleum products for all purposes. These officers are at once merchants, importers, exporters, warehouse managers, purchasing agents, and expediters.

The activities of the Quartermaster are diversified to such an extent that students majoring in any of the courses given at this college can fit well into the regular or reserve establishment upon graduation.

The Ordnance Corps

The Ordnance Corps provides the Armed Forces of our country with materiel for firepower and mobility—rifles, machine guns, artillery, ammunition, tanks, and trucks. Ordnance materiel ranges from time pieces to radar controlled automatic antiaircraft guns; from jeeps to ponderous tank transporters; from pistol cartridges to twenty-ton bombs, pyrotechnics, and guided missiles.

A large part of this type of materiel used by friendly foreign armies is supplied by the Ordnance Corps.

The Ordnance procurement program involves more expenditure of funds than all other Army services put together. Ordnance research projects require millions of dollars annu-

ally. The handling of its materiel requires the Army's largest depot system.

Ordnance officers perform work closely related with business and industry. They must be businessmen but the technical nature of Ordnance Corps activities calls for an engineering or scientific background. Mechanical and industrial engineers particularly will find a large amount of related work in the Ordnance Corps; and all engineers, physicists, and chemists will find Ordnance a fertile field in which to utilize their regular college courses both before and after graduation.

The Transportation Corps

One of the youngest of all services, the Transportation Corps performs transportation functions for the Army and provides such transportation service to the Air Force or Navy as may be agreed to jointly. Transportation officers are the Army's traffic managers as well as highway and railroad executives. Constant improvement in the movement of men and supplies throughout the world challenges the initiative, leadership, and ingenuity of transportation officers in command or staff capacities, many of which are closely allied with civilian occupations.

The academic courses which more nearly parallel this type of work are industrial engineering and business administration. However, no special academic course is necessary for admission to this branch.

The Army Security Agency

The Army Security Agency, a field agency of the Intelligence Division, has two broad interlocking functions. These two functions are communication intelligence and communication security.

To accomplish the mission of communication security, the Army Security Agency is responsible for the preparation, publication, storage, distribution, and accounting of all cryptosystems employed by the Army; the development and maintenance of cipher machines, the promulgation of community security doctrine; the monitoring of friendly radio traffic in order to detect and correct violations of communications security; the inspection of cryptocenters; and the surveillance of programs of cryptographic instruction.

Any major academic course is acceptable, subject to the demonstration of necessary aptitudes for Army Security Agency work prior to enrollment as an advanced Army Security Agency ROTC cadet.

The Signal Corps

The mission of the Signal Corps is to operate the Army's communications network; to do photographic work; to develop, procure, and repair communications equipment and weather forecasting equipment; and to furnish trained signal troops to elements of the Army that require them. Technically, it is that part of the Army that maintains communications, that is, message carrying activities, down to and including division headquarters. In short, signal communications in the Army are like the nerves of the body, nerves that enable the entire Army or any portion of it to act as an integrated unit.

Any student pursuing courses leading to a degree in engineering, electronics, or physics may be admitted to a senior division Signal Corps ROTC unit by selecting and completing one or more courses in electrical engineering as requirements or electives prior to graduation. However, as a second priority, the PMS&T may admit students pursuing courses other than those mentioned above at his discretion.

THE SCHOOL OF VETERINARY MEDICINE

The principal objective of the School of Veterinary Medicine is to provide complete training in all the phases of veterinary medicine. The degree of Doctor of Veterinary Medicine is conferred upon satisfactory completion of the curriculum in veterinary medicine. By following Curricular Option I, the student may qualify after four years of study for the degree of Bachelor of Science in Animal Science. (See Curricular Options below.)

The School of Veterinary Medicine is composed of the Departments of Veterinary Anatomy, Veterinary Bacteriology and Hygiene, Veterinary Medicine and Surgery, Veterinary Parasitology, Veterinary Pathology, and Veterinary Physiology and Pharmacology. The Department of Veterinary Medicine and Surgery operates the Veterinary Hospital and Ambulatory Clinics. A large proportion of the faculty from all departments is actively engaged in research. In addition to undergraduate instruction, each department offers courses at the graduate level leading to the degree of Master of Science and, in some cases, to the degree of Doctor of Philosophy.

Training is such that graduates of the School of Veterinary Medicine are well qualified to deal with problems of disease and disease prevention in domestic farm animals, poultry, pet animals, zoo animals, fur-bearing animals, and wild life. Graduates also are well qualified to administer and advise in the public health problems arising from intertransmission of diseases between man and the lower animals. Instruction and practical training are given in milk and meat hygiene and in the inspection of food processing plants. The School is accredited by the Council on Education of the American Veterinary Medical Association and by the United States Department of Agriculture.

ENTRANCE REQUIREMENTS

Admission to the curriculum in veterinary medicine is granted only for the beginning of the fall semester. Formal application must be filed with the Registrar between February 1 and June 15 of the year for which admission is sought. Accompanying the application form must be: complete academic records, including the preparatory record and college record; a record of courses in progress; and a statement showing the applicant to be in good standing.

Records of the applicant must show completion of a minimum of 60 semester hours, including: 6 to 8 hours of inor-

ganic chemistry, 6 to 8 hours of organic chemistry, 6 hours of zoology, 3 to 4 hours of botany, 6 hours of mathematics (algebra and trigonometry), 8 hours of English (6 in rhetoric and composition), 6 to 8 hours of physics, and 3 hours of American government. These records must be on file in the Registrar's Office by June 15 of the year in which the student is asking for admission to the veterinary curriculum. Variations and substitutions in these required hours of course work may be allowed only with the consent of the Dean of the School of Veterinary Medicine.

CURRICULAR OPTIONS

Three curricular options are open to students planning to study veterinary medicine.

Option I

Students may qualify for the degree of Bachelor of Science in Animal Science, to be conferred after 4 years of study. Under this option the regular pre-veterinary and veterinary curricula are followed. Elective requirements must be met by completing the following courses:

Agronomy 301; Economics 205; English 210, 301; Genetics 406; History 325; and 3 hours of electives in social sciences.

The privilege of exemption from final examinations in veterinary courses for students who are to receive the Bachelor of Science degree prior to completion of requirements for a degree in veterinary medicine will not be granted.

Option II

Students may qualify for a Reserve Officer's commission by scheduling advanced military or air science as electives in the first and second years of veterinary medicine. The number who are permitted to follow this option will necessarily be contingent upon the number of advanced ROTC contracts available.

Option III

Students who do not wish to qualify either for a Reserve Officer's commission or for the Bachelor of Science degree may register for electives of their own choosing, subject to approval by the Dean of the School of Veterinary Medicine.

Wherever possible, the student should choose his option early in the pre-veterinary curriculum.

ELECTIVES

Distributed over the pre-veterinary curriculum and the first two years of the veterinary curriculum are a total of 21 elective hours. The student need not schedule elective courses in exactly the units and semester shown in the curricula so long as a total of at least 21 acceptable elective hours are completed. He may also exceed the hour requirement in any semester provided that the number of grade points earned in the preceding semester entitles him to carry the desired number of hours.

ADMISSION TO THE THIRD YEAR OF VETERINARY MEDICINE

Regardless of the option chosen, a student may not be permitted to register for the third year of veterinary medicine unless he has completed, with an average grade of C or better, all work prescribed in the first two years of the veterinary curriculum

PRE-VETERINARY MEDICINE

The following two-year pre-veterinary curriculum is designed to qualify students for admission to the curriculum in veterinary medicine. A student who fails to gain admission to the curriculum in veterinary medicine may transfer to some other degree program, provided his scholastic record warrants continuance in the College.

Curriculum in PRE-VETERINARY MEDICINE

FRESHMAN YEAR

First Semester		Credit
Animal Husbandry 107 General Animal Husbandry	(2-3)	3
Biology 107 Vertebrate Zoology	(2-3)	3
Chemistry 101 General Chemistry	(3-3)	4
English 103 Composition and Rhetoric	(3-0)	3
Mathematics 101 Algebra	(3-0)	3
Military or Air Science	(0-3)	1
Physical Education 101	(0-2)	R
		17

Second Semester		Credit
Biology 101 General Botany of Seed Plants	(2-3)	3
Biology 108 Invertebrate Zoology	(2-3)	3
Chemistry 102 General Chemistry	(3-3)	4
English 104 Composition and Rhetoric	(3-0)	3
Mathematics 103 Plane Trigonometry	(3-0)	3
Military or Air Science	(0-3)	1
Elective		1
Physical Education 102	(0-2)	R
		18

SOPHOMORE YEAR

First Semester		Credit
Chemistry 301	(3-3)	4
Organic Chemistry		
Dairy Husbandry 202	(2-2)	3
Dairying		
English 207	(2-0)	2
Report Writing and Correspondence		
Military or Air Science	(0-3)	1
Physics 215	(2-2)	3
Introductory Physics		
Elective		5
Physical Education 201	(0-2)	R
		18

Second Semester		Credit
Chemistry 302	(3-3)	4
Organic Chemistry		
History 306	(3-0)	3
American National Government		
Military or Air Science	(0-3)	1
Physics 216	(2-2)	3
Introductory Physics		
Poultry Husbandry 201	(2-2)	3
Poultry Production		
Elective		3
Physical Education 202	(0-2)	R
		17

NOTE: Students should choose their sophomore electives from the following fields: economics, English, foreign language, journalism, and psychology.

LIMITED ENROLLMENT

Enrollment in the first year of the curriculum in veterinary medicine is limited by facilities of the College to a definite number each year. Selection within this quota is based on scholastic record and professional aptitude, and admission to the curriculum in pre-veterinary medicine does not carry assurance that a student will be admitted to the first year in veterinary medicine. Completion of the pre-veterinary requirements with satisfactory grades is a prerequisite for admission to the first year of the curriculum in veterinary medicine or to the veterinary courses of that year.

READMISSION

A veterinary student who voluntarily withdraws from College, or who is dropped from the rolls of the College for cause, forfeits his standing and must apply for readmission. A student who fails any of his veterinary courses may be required to withdraw from the School of Veterinary Medicine.

Curriculum in VETERINARY MEDICINE

(For the classes entering in 1954 and thereafter)

FIRST YEAR

Biochemistry and Nutrition 312	(3-6)	5
Veterinary Physiological Chemistry		
Genetics 301	(3-2)	4
Genetics		
Veterinary Anatomy 301	(1-12)	5
Veterinary Anatomy		
Veterinary Anatomy 303	(2-4)	3
Veterinary Histology		
Elective		3
		20

Animal Husbandry 320	(3-0)	3
Animal Nutrition and Feeding		
Entomology 208	(3-2)	4
Veterinary Entomology		
Veterinary Anatomy 302	(1-12)	5
Veterinary Anatomy		
Veterinary Anatomy 304	(2-4)	3
Veterinary Embryology		
Elective		3
		18

SECOND YEAR

First Semester		Credit
Veterinary Anatomy 401	(0-6)	2
Veterinary Anatomy		
Veterinary Bacteriology and Hygiene 435	(3-4)	4
Veterinary Bacteriology and Immunology		
Veterinary Pathology 443	(4-3)	5
Veterinary General Pathology		
Veterinary Physiology and Pharmacology 425	(3-6)	5
Veterinary Physiology		
Elective		3
		19

Second Semester		Credit
Veterinary Bacteriology and Hygiene 436	(2-4)	3
Special Veterinary Bacteriology		
Veterinary Parasitology 486	(2-2)	3
Parasites of Domestic Animals		
Veterinary Pathology 444	(4-4)	5
Veterinary Special Pathology		
Veterinary Physiology and Pharmacology 426	(3-3)	4
Veterinary Physiology		
Elective		3
		18

THIRD YEAR

Range and Forestry 311	(2-3)	3
Management of Range Resources		
Veterinary Medicine and Surgery 513	(3-0)	3
Veterinary Medicine		
Veterinary Medicine and Surgery 515	(5-0)	5
General Surgery		
Veterinary Medicine and Surgery 519	(0-3)	1
Veterinary Clinics		
Veterinary Parasitology 587	(2-2)	3
Parasites of Domestic Animals		
Veterinary Physiology and Pharmacology 527	(3-0)	3
Veterinary Pharmacology		
		18

Veterinary Bacteriology and Hygiene 536	(5-0)	5
Infectious Diseases		
Veterinary Medicine and Surgery 512	(1-0)	1
Veterinary Radiology		
Veterinary Medicine and Surgery 516	(3-4)	4
Veterinary Operative Surgery		
Veterinary Medicine and Surgery 518	(3-0)	3
Veterinary Obstetrics and Genital Diseases		
Veterinary Medicine and Surgery 520	(0-6)	2
Veterinary Clinics		
Veterinary Medicine and Surgery 522	(2-0)	2
Non-Infectious Diseases of Small Animals		
Veterinary Physiology and Pharmacology 528	(2-3)	3
Veterinary Pharmacology		
		20

FOURTH YEAR

Veterinary Bacteriology and Hygiene 591	(2-2)	3
Food Hygiene		
Veterinary Medicine and Surgery 553	(3-0)	3
Small Animal Practice		
Veterinary Medicine and Surgery 555	(0-24)	8
Veterinary Clinics		
Veterinary Medicine and Surgery 557	(2-0)	2
Veterinary Nutritional Pathology		
Veterinary Physiology and Pharmacology 571	(1-2)	2
Veterinary Toxicology		
		18

Business Administration 452	(3-0)	3
Veterinary Jurisprudence		
English 403	(1-2)	2
Speaking for Professional Men		
Veterinary Bacteriology and Hygiene 592	(2-0)	2
Veterinary Public Health		
Veterinary Bacteriology and Hygiene 596	(3-2)	4
Veterinary Poultry Pathology and Bacteriology		
Veterinary Medicine and Surgery 556	(0-24)	8
Veterinary Clinics		
Veterinary Medicine and Surgery 558	(1-0)	1
Veterinary Clinical Seminar		
		20

Curriculum in
VETERINARY MEDICINE

(For the Classes Graduating in 1954-55, 1955-56, and 1956-57)

SECOND YEAR

First Semester		Credit
Veterinary Anatomy 401	(0-6)	2
Veterinary Anatomy		
Veterinary Bacteriology and Hygiene 435	(3-4)	4
Veterinary Bacteriology and Immunology		
Veterinary Parasitology 481	(2-2)	3
Parasites of Domestic Animals		
Veterinary Pathology 443	(4-3)	5
Veterinary General Pathology		
Veterinary Physiology and Pharmacology 425	(2-6)	4
Veterinary Physiology		
		18

Second Semester		Credit
Range and Forestry 311	(2-3)	3
Management of Range Resources		
Veterinary Bacteriology and Hygiene 436	(2-4)	3
Special Veterinary Bacteriology		
Veterinary Parasitology 482	(2-2)	3
Parasites of Domestic Animals		
Veterinary Pathology 444	(4-4)	5
Veterinary Special Pathology		
Veterinary Physiology and Pharmacology 426	(3-3)	4
Veterinary Physiology		
		18

THIRD YEAR

Dairy Husbandry 313	(2-2)	3
Dairy Products Plant Operation		
Veterinary Medicine and Surgery 511	(1-0)	1
Veterinary Radiology		
Veterinary Medicine and Surgery 513	(3-0)	3
Veterinary Medicine		
Veterinary Medicine and Surgery 515	(5-0)	5
General Surgery		
Veterinary Medicine and Surgery 517	(3-2)	4
Veterinary Obstetrics and Genital Diseases		
Veterinary Medicine and Surgery 519	(0-3)	1
Veterinary Clinics		
Veterinary Physiology and Pharmacology 527	(3-0)	3
Veterinary Pharmacology		
		20

Veterinary Bacteriology and Hygiene 536	(5-0)	5
Infectious Diseases		
Veterinary Medicine and Surgery 514	(2-0)	2
Veterinary Nutritional Pathology		
Veterinary Medicine and Surgery 516	(3-4)	4
Veterinary Operative Surgery		
Veterinary Medicine and Surgery 520	(0-6)	2
Veterinary Clinics		
Veterinary Medicine and Surgery 522	(2-0)	2
Non-Infectious Diseases of Small Animals		
Veterinary Physiology and Pharmacology 528	(2-3)	3
Veterinary Pharmacology		
Veterinary Physiology and Pharmacology 530	(1-2)	2
Veterinary Toxicology		
		20

FOURTH YEAR

Veterinary Bacteriology and Hygiene 591	(2-2)	3
Food Hygiene		
Veterinary Bacteriology and Hygiene 595	(3-2)	4
Veterinary Poultry Pathology and Bacteriology		
Veterinary Medicine and Surgery 553	(3-0)	3
Small Animal Practice		
Veterinary Medicine and Surgery 555	(0-24)	8
Veterinary Clinics		
		18

Business Administration 452	(3-0)	3
Veterinary Jurisprudence		
Veterinary Bacteriology and Hygiene 592	(2-0)	2
Veterinary Public Health		
Veterinary Medicine and Surgery 556	(0-24)	8
Veterinary Clinics		
Veterinary Medicine and Surgery 558	(1-0)	1
Veterinary Clinical Seminar		
Elective		3
		17

THE GRADUATE SCHOOL

ADMINISTRATION

The Graduate School of the Agricultural and Mechanical College of Texas was established in 1924. Prior to that time graduate work was administered by the general faculty, acting through a committee on graduate studies. The faculty of the Graduate School, consisting of such members of the teaching staff and of the staffs of the Agricultural Experiment Station, the Texas Engineering Experiment Station, and the Texas Forest Service, all of which are parts of the Agricultural and Mechanical College System, as the President may appoint on nomination by the Dean of the Graduate School, has general jurisdiction over all matters relating to graduate work.

Matters of general policy are considered by the Graduate Council, consisting of twelve members, which reports its recommendations to the Academic Council. In cases in which prompt action is desirable, the Council is authorized to act, reporting its action to the Academic Council for ratification.

Committees on Graduate Instruction are appointed for the Schools of Agriculture, Arts and Sciences, Engineering, and Veterinary Medicine.

The Dean of the Graduate School is the representative of the Academic Council in dealing with individuals and is charged with the execution of its regulations. Petitions are acted upon by the Dean, the Executive Committee, or by the Graduate Council, if any matter is involved concerning which a policy has not been definitely established.

ADMISSION

A formal application is required of all persons seeking admission to the Graduate School. The application forms, which are available at the office of the Graduate School, should be filed not later than four weeks prior to the opening of the semester. Admission to the Graduate School cannot be granted until all the credentials enumerated in the application form have been filed.

All communications relating to admission or other matters concerned with graduate work should be addressed to the Dean of the Graduate School.

GRADUATE DEGREES

Graduate courses of study are offered leading to the degrees of:

Master of Agriculture (M.Agr.)
Master of Architecture (M.Arch.)
Master of Business Administration (M.B.A.)
Master of Education (M.Ed.)
Master of Engineering (M.Eng.)
Master of Science (M.S.)
Doctor of Philosophy (Ph.D.)

The Master of Science degree is awarded to students who have received appropriate bachelor's degrees and have thereafter successfully completed an approved advanced course of study requiring not less than one academic year (32 semester hours) of work.

The degree of Doctor of Philosophy is awarded in certain fields related to agriculture and engineering. A student who has received an appropriate bachelor's degree and has thereafter completed an approved program of advanced study and research may qualify for this degree.

PROFESSIONAL DEGREES IN ENGINEERING

The following professional degrees in engineering are available only to graduates of this college:

Aeronautical Engineer (Aero.E.)
Agricultural Engineer (A.E.)
Architectural Engineer (Arch.E.)
Chemical Engineer (Ch.E.)
Civil Engineer (C.E.)
Electrical Engineer (E.E.)
Geological Engineer (Geol.E.)
Industrial Engineer (Ind.E.)
Mechanical Engineer (M.E.)
Petroleum Engineer (P.E.)

These degrees are offered on the basis of acceptable professional experience, a thesis, and an examination.

RESIDENCE

The Master's degree will be conferred only after a residence at the College of at least one academic year except that this requirement may be satisfied by residence during five summer terms of six weeks each, or an approved equivalent.

The degree of Doctor of Philosophy will be conferred only after a residence of at least one continuous academic year beyond the Master's degree.

GRADUATE SCHOOL BULLETIN

There is published biennially as a bulletin of the College, an announcement of the work of the Graduate School, in which will be found full information concerning conditions of admission and requirements for degrees, including residence, thesis, and examinations. A copy of this bulletin is available upon request at the Office of the Dean of the Graduate School.

Courses of Instruction by Departments

All courses offered in the College are described on the following pages and are listed by departments, arranged alphabetically.

The course numbering scheme is as follows:

101 to 199, courses primarily open to freshmen.

201 to 299, courses primarily open to sophomores.

301 to 399, courses primarily open to juniors.

401 to 599, courses primarily open to seniors.

601 to 699, courses primarily open to graduates.

Those undergraduate courses marked at the right by a "†" may be taken for graduate credit.

Figures in parenthesis following the number of the course indicate the clock hours per week devoted to theory and practice respectively. Theory includes recitations and lectures; practice includes work done in the laboratory, shop, drawing room, or field. The unit of credit is the semester hour, which involves one hour of theory, or from two to four hours of practice per week for one semester of eighteen weeks.

Roman numerals to the right of the credit value of each course indicate the semester in which it is regularly offered. The letter "S" denotes summer offerings.

Any course may be withdrawn from the session offerings in case the number of registrations is too small to justify the offering of the course.

Administration

301. Introduction to Philosophy. (3-0). Credit 3. I

An introduction to the nature of philosophic inquiry; theories of reality and of knowledge; including idealism, naturalism, and pragmatism; the relation of philosophy to religion, science, history, politics, and education. The aim is to stimulate thinking about problems of conduct and to develop principles and methods of passing judgment on current social issues. Prerequisite: Junior classification.

304. Philosophies of Life. (3-0). Credit 3. II

A survey including the biographical and historical background, of the philosophies of the major philosophical thinkers from Socrates to Russell, and of their influence upon the thinking of mankind; incidental consideration of the ideals and values involved in moral, religious, esthetic, and scientific points of view.

311. Use of Library Resources. (0-2). Credit 1. I, II

A course designed to develop in students skill in the use of library resources at the upper level. Emphasis placed on specialized reference tools. Prerequisites: Completion of sophomore English; junior classification.

FOR GRADUATES

601. College Teaching. (2-0). Credit 2. I, II

Conceptions of higher education underlying typical programs including General Education, the learning process, and effective use of techniques and instrumentalities of classroom instruction. Prerequisite: Graduate classification.

Department of Aeronautical Engineering

Professor E. E. Brush; Associate Professors H. N. Abramson, B. B. Hamner

201. Elementary Aerodynamics. (3-3). Credit 4. II, S

Basic aerodynamic phenomena and simplified theory; elementary aircraft performance. Prerequisites: Mathematics 209 and 210, or registration therein; Mechanical Engineering 212 or registration therein; Physics 203, 204 or registration therein.

221. Private Pilots Course. (2-2). Credit 3. I, II

Stage 1 of commercial pilots course, civil air regulations, meteorology, aerial navigation, radio facilities, general service of aircraft, flight instruction. (36 hours of ground instruction, 35-45 hours of flight instruction)

301. Theoretical Aerodynamics. (3-0). Credit 3. I

Fluid statics, kinematics, energy, momentum, similarity, viscosity, boundary layer, drag, circulation, lift, potential flow, thin airfoil theory, high lift devices. Prerequisite: Aeronautical Engineering 201.

302. Experimental Aerodynamics. (1-3). Credit 2. II

Wind tunnels and testing techniques. Wind tunnel calibration, airfoil pressure distribution, chord loading, airfoil drag by wake survey, boundary layer. Corrections of wind tunnel data for scale and other effects. Prerequisite: Aeronautical Engineering 301.

303. High Speed Aerodynamics. (3-0). Credit 3. II

Airfoil section characteristics and critical Mach Number. Span loading, fundamentals of compressible flow, pressure, coefficients, critical conditions, aerodynamic heating, shock waves, compressibility effects, sweepback, and high speed data. Prerequisites: Aeronautical Engineering 301, registration in 302.

304. Elementary Aircraft Structures. (3-0). Credit 3. I

Airplane load analysis, external and internal loads and reactions for trusses, beams and space frameworks. Prerequisites: Aeronautical Engineering 201; registration in Civil Engineering 305; Mechanical Engineering 212.

306. Strength of Aircraft Materials. (2-3). Credit 3. II

Mechanical properties of materials and their use in design of members subject to tension, compression, shear and bending. Combined stresses and margins of safety. Prerequisites: Aeronautical Engineering 304; Civil Engineering 305.

401. Aircraft Design. (2-6). Credit 4. I

Aerodynamic design, specification, arrangement, performance analysis, weight and balance, stability. Prerequisite: Aeronautical Engineering 303.

402. Aircraft Design. (2-6). Credit 4. II

Structural design of major airframe components, consideration of government airworthiness requirements and customer specifications. Prerequisites: Aeronautical Engineering 401, 405.

403. Aircraft Materials and Processes. (1-3). Credit 2. I

Metallography of aluminum alloys, magnesium alloys, steel, nickel alloys, plastics, manufacturing methods, tool design, standards, heat treatment, finishes, factory organization. Prerequisite: Aeronautical Engineering 306.

405. Aircraft Structures. (3-0). Credit 3. I

Analysis of thin sheet metal structures, including shells, beams and compression members subjected to critical loads. Prerequisite: Aeronautical Engineering 306.

406. Aircraft Power Plant Operation. (2-3). Credit 3. II.

The use of modern instruments for testing aircraft engines, analysis of performance, design study, theory of operation. Prerequisite: Mechanical Engineering 410.

408. Seminar. (1-0). Credit 1. II

Readings, reports, conferences, and discussion. Prerequisite: Senior classification in aeronautical engineering.

410. Airplane Detail Design. (2-3). Credit 3. II

Layout and design of aircraft component parts and fittings. Prerequisites: Aeronautical Engineering 306, 405.

415. Flight Test Engineering. (2-3). Credit 3. II

Theory of operation and application of flight test instruments; procedures for obtaining flight test data; interpretation of flight test data; airplane performances estimation from flight test data. Prerequisite: Aeronautical Engineering 401.

417. Aircraft Propulsion Systems. (3-0). Credit 3. II

A study of the development, fundamentals, theories, construction, design, and performance of turbo-jet, ram jet, pulse jet, and rocket power plants for aircraft. Prerequisites: Aeronautical Engineering 401; Mechanical Engineering 410.

418. Advanced Aerodynamics. (4-0). Credit 4. II †

Theoretical and experimental aerodynamics for students majoring in aerodynamics. Theory of ideal fluid, viscous effects, compressible flow, and application to design problems. Prerequisites: Must have received at least a grade of B in Aeronautical Engineering 303 and Mathematics 307 or special permission.

421. Dynamics of Airplanes. (3-0). Credit 3. II

Linear theory of vibrations of single and multi-degree of freedom systems; self-excited vibrations. Applications of matrix algebra. Elementary theory of flutter; landing impact, gust response, aero-elastic effects, dynamic stability. Prerequisites: Aeronautical Engineering 401; Mathematics 307 or 308.

FOR GRADUATES

601. Principles of Fluid Motion. (4-0). Credit 4. I

Mathematical methods of analysis are emphasized. Perfect fluid theory development. Treatment of viscosity and boundary layer phenomena. Prerequisites: Aeronautical Engineering 303; Mathematics 307.

603. Aerodynamics of the Airplane. (4-0). Credit 4. I

Application of vector analysis to two- and three-dimensional airfoil theory. Viscosity and compressibility. Drag of aircraft components. Static and dynamic stability criteria. Prerequisites: Aeronautical Engineering 303; Mathematics 307.

604. Dynamics of Compressible Fluids. (4-0). Credit 4. II

Properties of compressible fluids, dynamics of one-dimensional motion, channel flows, shock waves, methods of observation, extension to two- and three-dimensional flow, effects of viscosity. Prerequisite: Mathematics 307.

605. Aircraft Structural Analysis. (4-0). Credit 4. I

The classical methods of analysis derived from strain energy and their application to aircraft structural problems. Studies of stresses and strains in aircraft structural arrangements involving thin sheets, sandwich construction, and different materials. Special problems and studies attendant to aircraft column work. Prerequisite: Mathematics 307 or special permission.

606. Aircraft Structural Design. (2-6). Credit 4. II

Major structural design requirements of high performance aircraft will be studied. New materials and fabrication methods will be considered (magnesium, metalite, material combinations, etc). Original designs will be undertaken by each student. Prerequisite: Aeronautical Engineering 605.

607. Aircraft Structural Testing. (1-3). Credit 2. I

Static and dynamic testing procedures for aircraft structural testing, instruments used, data taking, data analysis, reports. Prerequisites: Aeronautical Engineering 605; Mechanical Engineering 617.

608. Aircraft Flutter Analysis. (4-0). Credit 4. II

Theoretical development of the structural and aerodynamic equations for two- and three-dimensional aircraft flutter. Numerical solutions in practical problems to determine flutter velocities. Methods of testing to determine vibration characteristics of aircraft. Prerequisites: Aeronautical Engineering 421 or Mechanical Engineering 617; Mathematics 307.

691. Research. Credit 2 to 6 each semester. I, II

Technical research projects approved by the Head of the Department.

Department of Agricultural Economics and Sociology

Professor T. R. Timm,
Professors J. W. Barger, L. P. Gabbard, R. L. Hunt, J. G. McNeely, W. E. Paulson, Daniel Russell; Associate Professors M. S. Brooks, J. R. Campbell, D. R. Davis, B. H. Nelson; Assistant Professors Harley Bebout, R. L. Skrabanek, J. M. Ward

AGRICULTURAL ECONOMICS

105. Introduction to Rural Economy. (3-0). Credit 3. I, II

An introduction to the economic problems of agriculture and the place of agriculture in our national economy.

205. Cotton Trade Procedure. (3-0). Credit 3. I

Policies and practices employed in the cotton trade with emphasis on local marketing operation.

209. Elementary Cotton Classification. (0-3). Credit 1. I

Introductory studies of cotton quality and cotton classing through practice in identifying the important grades and staples.

210. Principles of Cotton Classification. (1-3). Credit 2. II

Grading and stapling instruction, factors affecting cotton quality, and practice in classing a wide variety of samples.

314. Marketing Farm Products. (3-0). Credit 3. I, II, S

A general introductory course covering the principles, practices, and problems involved in the marketing of agricultural commodities.

315. Economic History of Agriculture. (3-0). Credit 3. II

The economic history of American agriculture and its European background; the interrelationship between development in agriculture and industry and commerce; the growth of institutions and the enactment of legislation for the advancement of agriculture.

321. Farm and Ranch Records and Accounts. (1-3). Credit 2. I

Systems of records and accounts suited to farms and ranches; adaptation of types of records and accounts to meet specific needs. Emphasis on the use of records and accounts as aids to more efficient farm and ranch management. Laboratory work devoted to problems in keeping and using the various types of records and accounts. Prerequisite: Twelve hours of credit in technical agriculture. (Offered in 1954-55 and alternate years thereafter)

324. Agricultural Prices. (3-0). Credit 3. I

Analysis of factors influencing the price of farm commodities. Prerequisite: Economics 203 and 204, or 205, or 403.

404. Marketing Practices. Credit 3. S †

A study of current marketing practices and problems.

413. Cooperation in Agriculture. (3-0). Credit 3. I †

Analysis of the past and present practices and problems of cooperatives in the United States and foreign countries, with major attention to farmers' cooperative marketing and purchasing activities. Prerequisite: Agricultural Economics 314.

416. Marketing Livestock. (2-0). Credit 2. I †

The practices and problems involved in the marketing of livestock and livestock products. Prerequisite: Agricultural Economics 314.

421. Principles of Farm and Ranch Management. (2-2). Credit 3. I, II

The application of business principles to the organization and operation of farms and ranches. Special attention to the factors influencing farm profits. Laboratory work based on actual farms and ranches. Prerequisite: Twenty hours of credit in technical agriculture.

422. Land Economics. (3-0). Credit 3. I, II

The physical, institutional, and economic factors involved in the utilization of land. Prerequisites: Economics 203 and 204, or 205, or 403.

429. Public Policies Affecting Agriculture. (3-0). Credit 3. I, II †

A critical analysis of the past and present programs of governmental agencies and farmers' organizations for the economic betterment of agriculture. Prerequisites: Economics 203 and 204, or 205, or 403.

430. Agricultural Finance. (3-0). Credit 3. I, II †

Analysis of the credit requirements of individual farmers and farmers' cooperative organizations; investors and depositors as sources of credit; principles upon which each type of farm credit is extended; the instruments and legal aspects of farm credit; the cost of credit; description of financial institutions which serve agriculture, with major attention to the component units of the Farm Credit Administration. Prerequisites: Economics 203 and 204, or 205, or 403.

432. Farm and Ranch Organization and Operation. (1-3). Credit 2. II

Detailed problems involved in the organization and management of specific farms and ranches, covering such matters as efficiency analysis, budget preparation, layout and improvement. Prerequisite: Agricultural Economics 421. (Offered in 1954-55 and alternate years thereafter)

441. Farm Law. (3-0). Credit 3. I, II

A study of the legal aspects of agriculture.

460. Economic Aspects of Farm Tenancy. (2-0). Credit 2. S †

Principles and practices of effective farm leases and the development of land tenure systems in this country. Prerequisite: Approval of the instructor.

481. Seminar. (1-0). Credit 1. I

Role of social scientist in the agricultural industry; professional opportunities and responsibilities; individual investigations and reports; discussions with prominent leaders in field. Prerequisite: Senior classification in agricultural administration or approval of Head of Department.

FOR GRADUATES

601. Farmers Movements. (4-0). Credit 4. II

History of efforts of farmers to solve their economic problems. Prerequisite: Agricultural Economics 314.

602. Agricultural Marketing. (4-0). Credit 4. I, S

An analysis of the problems involved in the marketing of farm products. Prerequisite: Agricultural Economics 314.

603. Land Economics. (4-0). Credit 4. II

An extensive study of problems involved in developing state and national policies for the proper utilization of our land resources. Prerequisite: Agricultural Economics 422.

611. Farm Management. (2-3). Credit 3. I

A study of research problems in farm management, methods used in obtaining farm management data, specific problems in conducting farm management surveys, and cost of production studies; analysis of farm management data; use of findings in formulating farm organization and management programs. Survey of research literature in farm and ranch organization and management. Prerequisite: Agricultural Economics 421.

612. Cotton Marketing. (4-0). Credit 4. I

Extensive study of potential cotton areas of the world, trends in production, trends of consumption of cotton and substitutes for cotton in the various consuming areas; national and international policies that affect the cotton farmers; price determining factors in the various markets; governmental aid in estimating supply and demand; regulations of standards, and control of futures market; cooperative versus individual sale of cotton. Prerequisite: Agricultural Economics 314.

614. Agricultural Policy. (4-0). Credit 4. I

An analysis of public policies and programs affecting agriculture. Prerequisite: Agricultural Economics 429.

615. Farm Taxation. (4-0). Credit 4. II

A study of the taxation of farm property and of the cost and services of local government. Prerequisites: Economics 203, 204.

620. Agricultural Finance. (4-0). Credit 4. II, S

Problems in financing agricultural production and marketing. Analysis of operations of financial institutions serving agriculture. Prerequisite: Agricultural Economics 430.

627. Agricultural Prices. (4-0). Credit 4. S

An economic and statistical analysis of the prices of agricultural products. Prerequisites: Agricultural Economics 324; Business Administration 303.

641. Applied Agricultural Statistics. (3-3). Credit 4. I

Planning the statistical research project, developing forms, selecting the sample, conducting the study, tabulating, analyses, and interpreting the data. Prerequisites: Business Administration 303 or Genetics 406 or equivalent; 15 hours of social science; approval of the instructor.

645. Government and Agriculture. (3-0). Credit 3. S

A special three-weeks summer course for Extension Service personnel and other professional agricultural workers, covering government functions in agriculture; goals and values of farm people; nature and significance of political and economic institutions; processes in formation and execution of agricultural policy; case studies in special agricultural policy areas; and opportunities for and methods in educational work with farm people in the field of agricultural policy. Prerequisite: Approval of the instructor.

681. Seminar. (1-0). Credit 1 each semester. I, II

A review of current literature, preparation of papers on selected topics, and discussions with visiting agricultural economists. Prerequisite: Graduate classification.

685. Problems. Credit 1 to 4 each semester. I, II, S

A directed individual study of a selected problem in the field of agricultural economics. Prerequisite: Approval of the instructor.

691. Research. Credit 1 or more each semester. I, II, S

Methods of research. Investigation and preparation of thesis.

RURAL SOCIOLOGY

205. Principles of Sociology. (3-0). Credit 3. I, II, S

The scope and objectives of sociology and rural sociology. An analysis of culture, social groups, and personality; of their interrelationships; of how they develop and change; and of how these changes produce social problems.

206. Principles of Sociology. (3-0). Credit 3. II

An introduction to social institutions and some of their major problems, to the processes of social interaction, and to population phenomena and problems. Major emphasis is on analysis of revolution and war, especially the causes and prevention of revolution and war. Prerequisite: Rural Sociology 205.

304. Criminology and Juvenile Delinquency. (3-0). Credit 3. I, II, S

Extent and cost of crime. Causes of crime. Processes of criminal behavior. Ecology of crime. Theories of criminology and penology. The police system. Criminal and juveline courts, the indeterminate sentence, and pardon. Punishment and treatment of criminals and juvenile delinquents. Prison system and reformatories. Probation and parole. Recidivism and reformation. Prevention of crime.

306. Rural Social Work. (3-0). Credit 3. I

The development and organization of public and private social work, with critical analysis of group work in small towns and rural communities. Emphasis is placed on the provisions of the Social Security Act and the State Department of Public Welfare. Case work techniques, family welfare work, child welfare services, mental hygiene, medical social work, social service exchange, councils of social agencies and other social agencies in group work planning are studied. Prerequisite: Rural Sociology 205.

311. Social Psychology. (3-0). Credit 3. I †

An analysis of why people behave the way they do. The effect of social experiences and of the groups people belong to upon the development of personality. How to influence and control the behavior of people. Social adjustment and maladjustment including analysis of causes. Public opinion. Prerequisite: Psychology 207 or Rural Sociology 205.

314. Social Problems. (3-0). Credit 3. II

A study of social problems associated with poverty and dependency, unemployment and underemployment, race relations, health, housing, the unmarried, vice, and mental deficiency. Prerequisite: Rural Sociology 205.

315. The Family. (3-0). Credit 3. I, II

A study of the evolution and growth of the family as a fundamental social institution. A critical analysis of changes taking place in the family and in society that affect the family with chief emphasis being placed on the modern family and its problems. Prerequisite: Junior classification.

404. Rural Organization. (3-0). Credit 3. I †

A study of the community as a fundamental unit of rural organization. An analysis of community types, forces, and resources with suggested comprehensive programs to meet community needs. Orientation into local community settings, such national programs as Extension Service, F.S.A., Soil Conservation, 4-H Clubs, F.F.A.'s, Farm Bureau, Farm Grange, public health, recreation, etc. Not open for graduate credit to students who have taken Rural Sociology 612. Additional assignments will be required of students seeking graduate credit. Prerequisite: Rural Sociology 205 or its equivalent.

407. Rural Life Problems. (3-0). Credit 3. I, II, S

An analysis of the conditions, forces, and agencies influencing the life of the country dweller and the rural community. A study of a number of special social problems relating to rural life, such as population questions, migration, farm labor, farm tenure, rural schools, rural health and sanitation, community organizations, and community planning. Special attention is given to these problems as found in Texas. This course is specifically planned for men in departments other than Rural Sociology. Not open to majors in this department. Prerequisite: Junior classification.

408. Organization for Boy Scout Work. (2-0). Credit 2. II

History and development of the Boy Scout movement. Understanding the boy and fitting a program to meet his needs. Developing adult leaders in the boy, man institutional relationship. Specialized programs such as cubbing, senior scouting, sea scouting, etc. Fitting scouting to the rural boy's needs and life pattern.

417. Rural Social Problems. (3-0). Credit 3. I, II †

An analysis of rural social problems pertaining to health, farm labor, tenancy, the church, welfare work, education, local government, and race relations with emphasis upon causes and proposed solutions. Prerequisites: Rural Sociology 205 or the equivalent and 9 additional hours of social science, or 18 hours of social science; senior classification. Not open to students who have taken Rural Sociology 601.

FOR GRADUATES

601. Rural Social Problems Analysis. (4-0). Credit 4. I

Analysis of rural social problems pertaining to health, farm labor, tenancy, the church, welfare work, education, local government, race relations, and population problems with emphasis upon causes and proposed solutions. Concurrent training in outlining and in objective, scientific style of presentation preferred in sociological publication. Not open for graduate credit to students who have had Rural Sociology 417. Prerequisites: Rural Sociology 205 or its equivalent and 9 additional hours of social science*; or 18 hours of social science*.

602. Rural Sociology. (4-0). Credit 4. II

A review of the contributions of present-day rural sociologists and other social scientists to the field of rural sociology. Emphasis upon critical evaluation as to scientific standards and procedures used in specific studies in the field. Prerequisites: Rural Sociology 205 or its equivalent; 9 additional hours of sociology.

606. Rural Youth Leadership. (4-0). Credit 4. I, S

A survey and analysis of the rural youth problems and a discussion of techniques of rural youth leadership. The course is meant for school teachers, boy scout leaders, F.F.A., 4-H Club, Y.M.C.A., Y.W.C.A., and other youth leaders. The course will consist of lectures and field trips to youth projects. Prerequisites: Rural Sociology 205 or its equivalent and 9 additional hours of social science*; or 18 hours of social science*. If the latter alternative is chosen, suitable practical experience may be substituted at the rate of four months of experience per credit hour up to a total of eight credit hours.

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*For this purpose social science is defined to include only courses in economics, agricultural economics, psychology, political science, anthropology, and sociology.

611. History of Social Thought. (4-0). Credit 4. II

The development of social thought from ancient times to the present. Chief emphasis is placed upon sociological thinkers who have made significant contributions to the field, the theories of these men, and the background from which these theories evolved. Prerequisites: Rural Sociology 205, 206, and 311 or their equivalent; 6 additional hours of other social sciences*. Additional social science* courses may be substituted for any two of the above sociology courses at the ratio of three hours of other social science per one hour of sociology.

612. The Rural Community. (4-0). Credit 4. II

A study of the rural community as to its geographic background, population, social institutions, and occupational attitudes. Different efforts at organizing the rural community, as the county public welfare project, school and church community center projects, recreational and health projects, local, state, and national agencies for rural community cooperation are studied. Not open to students who have taken Rural Sociology 404 for graduate credit. Prerequisites: Rural Sociology 205 or its equivalent and 9 additional hours of social science*; or 18 hours of social science*. If the latter alternative is chosen, suitable practical experience may be substituted at the rate of four months of experience per credit hour up to a total of eight credit hours.

618. Educational Sociology. (3-0). Credit 3. S

How our school system can strengthen our democratic way of life. The relationship of education to social organization, social change, and social control. Sociological analysis of the role of education in our society. Prerequisites: Rural Sociology 205 or the equivalent; 9 additional hours of social science or a degree in education.

685. Problems. Credit 1 to 4 each semester. I, II, S

A directed individual study of a selected problem in the field of rural sociology. Prerequisite: Six hours of rural sociology or 12 hours of supporting social science.

691. Research. Credit 1 or more each semester. I, II, S

Initiation and completion of a research project of approved scope for an advanced degree. Prerequisite: Approval of the instructor.

Department of Agricultural Education

Professor E. V. Walton,
Professor Henry Ross; Associate Professor M. N. Abrams; Assistant Professors B. D. Cook, J. R. Jackson, W. W. McIlroy

301. Principles of Agricultural Education. (3-0). Credit 3. I

An introduction to the study of agricultural education, designed to acquaint the student with the principles of education theory, the aim and meaning of education, leadership training, professional organizations, and literature. Organization and operation of Future Farmer chapters.

425. Course Building. (2-0). Credit 2. II †

Preparing units of instruction in vocational agriculture for all-day, part-time, and evening school classes.

426. Methods in Adult Agricultural Education. (2-0). Credit 2. I †

Planning educational programs and activities for adult farm people in young farmer and adult classes. Developing skill in the use of the group process in teaching.

427. Methods of Developing Farming Programs. (1-2). Credit 2. II †

Planning and supervising farm programs of vocational agriculture students.

430. Administration and Supervision of Vocational Agriculture. (2-0). Credit 2. II †

To develop an understanding of school organization, objectives, and operation, emphasizing place of vocational education in the school organization. The national, state, and local organizations for administration and supervision of agricultural education. Keeping records and reports of activities of the agricultural education program. Field observation and reports in Agricultural Education 431, 432.

*For this purpose, social science is defined to include only courses in economics, agricultural economics, psychology, political science, anthropology, and sociology.

431. Student-Teaching in Vocational Agriculture. (2-2). Credit 3. I

Methods of teaching in agricultural education; planning for and teaching vocational agriculture in Texas. Three weeks observation and student teaching in local departments of vocational agriculture. Presentation and discussion of problems encountered by student teacher in the field. Prior planning required.

432. Student-Teaching in Vocational Agriculture. (2-2). Credit 3. II

Planning for and teaching vocational agriculture in selected departments in Texas. Three weeks student teaching and observation in local departments of vocational agriculture. Presentation and discussion of problems encountered by practice teachers in the field. A study of current problems in teaching vocational agriculture. Prior planning required.

441. Agricultural Extension Organization and Methods. (2-2). Credit 3. I, II

Cooperative agricultural extension service objectives, organization and administration, operation, results, social and economic significance. Analytical approach to farm and home problems. Principles of extension teaching and measuring results. Methods in selecting, training, and using farm leaders. Principles in dealing with practical problems of planning, developing, and executing county programs. Prerequisite: Senior classification.

FOR GRADUATES

(One year of acceptable experience and Agricultural Education 425, 426, 430, 431, 432, or their equivalents are prerequisites to the following courses.)

601. Advanced Methods in Agricultural Education. (3-0). Credit 3. I, S

An advanced course in methods of teaching vocational agriculture.

605. Supervised Farming. (3-0). Credit 3. I, S

Advanced study of supervised farming in vocational agriculture and methods of supervising students in carrying out supervised farming programs.

607. Future Farmer and Young Farmer Activities. (3-0). Credit 3. II, S

Methods of conducting Future Farmer and young farmer activities.

610. Adult Education in Agriculture. (3-0). Credit 3. II, S

Methods of organizing and conducting adult education programs in vocational agriculture on a participation basis. Supervision of practice work, determining course content, follow-up work, setting up publicity programs, and evaluating improved practices resulting from evening school instruction.

613. Administration and Supervision of Agricultural Education. (3-0). Credit 3. II, S

Problems of organization, administration, and supervision of vocational agriculture, experiment station, and extension work.

615. Philosophy of Agricultural Education. (3-0). Credit 3. S

A study of the philosophy and evaluation of agricultural education. Emphasis on the development and use of evaluative criteria and tests in the field of vocational education in agriculture.

616. Program Building in Agricultural Education. (3-0). Credit 3. I, II, S

Organization of programs in agricultural education on local, state, and national basis. Securing assistance of public school administrators, farmers, and county, state, and national agricultural agencies in program building.

619. Workshop Course. Credit 3. S

For workers with experience in agricultural education. Devoted to study of professional problems in agricultural education. Offered in summer only on a full day schedule for three weeks.

624. Agricultural Extension Methods. (3-0). Credit 3. S

A workshop course in which experienced Extension Service personnel work together under approved leadership on common problems to study new extension techniques and improve old ones. Offered on a full day schedule for three weeks.

630. Guidance and Counseling for Rural Youth. (3-0). Credit 3. S

Analysis of occupational and vocational opportunities for rural youth, techniques of individual group counseling and guidance. Practicum in personality and occupational interest testing. Prerequisites: Twelve hours of education and one year's experience in teaching and supervising group youth activities.

685. Problems. Credit 2 to 4 each semester. I, II, S

Studies related to classroom, laboratory, supervised farming, and adult education activities. For Master of Education programs only.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis for Master of Science programs only.

Department of Agricultural Engineering

Professor F. R. Jones,
Professors Price Hobgood, P. T. Montfort; Associate Professor R. C. Garrett; Assistant Professor R. N. Craig; Instructors W. H. Aldred, E. C. Brown, Jr., S. T. Russell, L. H. Wilkes*

201. Farm Power and Machinery. (2-2). Credit 3. I, II

Construction, operation, adustment, and servicing of farm engines and tractors. Adaptability, selection, economic utilization, construction, operation, and adjustment of the principal tillage, planting, cultivating, harvesting, and feed processing machines.

205. Farm Buildings and Structures. (2-3). Credit 3. I

Methods of construction and selection and utilization of materials for farm buildings. Specification writing and material estimating.

208. Farm Machinery. (3-3). Credit 4. II

Selection and economic application as well as the design, construction, operation, adjustment, care, and repair of all types of farm machinery. Prerequisite: Physics 203.

213. Food Plant Engineering. (2-3). Credit 3. II

Elementary mechanics, power transmission, steam and steam boilers, pipes and pipe fitting, refrigeration and insulation, temperature measurement and control, electric motors, disposal of waste products, and mechanical problems as applied to foods and food processing.

219. Farm Shop. (2-3). Credit 3. I

A special course in shop work for students majoring in agricultural engineering. Includes some woodwork and roof framing, forging, soldering, welding, pipe fitting, machinery repair, and use of hand and power tools.

221. Farm Shop. (1-3). Credit 2. I

A course for students in agricultural education and general agriculture involving carpentry and woodwork, tool sharpening, preparation of simple drawings and bills of materials, blueprint reading, and rafter cutting.

222. Farm Shop. (1-3). Credit 2. I, II

A course for students in agricultural education and general agriculture involving electric and gas welding, cold metal work, forging, soldering, pipe fitting, and the preparation and use of concrete.

305. Terracing and Drainage. (3-3). Credit 4. I, II

Elementary surveying, use of tape, chain, level, plane table; land drainage; terracing, gully control, irrigation; land clearing and reclamation methods.

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*On leave of absence.

323. Farm Power. (2-2). Credit 3. I

Sources of farm power and their economic application. Theory and development of the internal combustion engine. Design, construction, operation, and adjustment of various types of stationary internal combustion engines. Prerequisites: Physics 203, 204 or registration therein.

324. Automotive Machinery. (3-3). Credit 4. II

Construction, operation, care and repair of tractors, trucks, and automobiles; tractor types and sizes and their economic adaptability and utilization. Prerequisite: Agricultural Engineering 323.

325. Farm Electricity. (2-2). Credit 3. I, II

A course for students in agricultural education and general agriculture and including elements of electric current generation and transmission, farm application of electric heating, lighting and power, wiring motors, power rates, meter reading, safety rules and regulations.

331. Advanced Farm Shop. (2-3). Credit 3. II

An advanced course for students majoring in agricultural education. Special emphasis is placed upon improving skills and in developing proper teaching methods in doing woodwork, welding, metal work, farm plumbing, and electric wiring. Prerequisites: Agricultural Engineering 221, 222. (Offered in 1954-55 and in alternate years thereafter)

333. Surveying and Water Utilization. (2-3). Credit 3. I, II

Elementary surveying including chaining, leveling, and mapping as applied to farm needs. Water control and conservation with special emphasis on basic irrigation and terracing principles and practices.

410. Irrigation and Drainage Engineering. (2-3). Credit 3. II †

Principles of farm drainage as applied to open ditches and tile drains; drainage districts and laws; land clearing and reclamation methods. Principles of irrigation practice; sources of water supply; distribution systems; application of water to crops; measurement and duty of water; alkali control. Prerequisites: Civil Engineering 201, 311.

413. Farm Structures Design. (2-3). Credit 3. II †

Structural problems in farm building design. Functional planning of farm buildings with respect to economy, convenience, sanitation, and appearance. Prerequisites: Agricultural Engineering 205; Civil Engineering 305.

418. Farm Home Utilities. (2-3). Credit 3. I †

Types, installation, operation, care, and repair of the following utilities for farm buildings; ventilation, heating, lighting, water supply, sewage disposal, refrigeration, air conditioning. Prerequisite: Physics 204.

425. Seminar. (1-0). Credit 1. I †

A review of current literature dealing with agricultural engineering problems presented by staff members and students. Prerequisite: Senior classification.

426. Seminar. (1-0). Credit 1. II †

Presentation of papers dealing with new developments and results of investigations of problems related to agricultural engineering. Prerequisite: Senior classification.

428. Soil and Water Conservation Engineering. (2-3). Credit 3. I †

Principles of engineering practice as applied to soil and water conservation, including runoff, terrace and terrace outlet design and construction; proper cultural and tillage practices and related topics. Prerequisites: Civil Engineering 201, 311 or registration therein.

430. Farm Electrification Engineering. (2-3). Credit 3. II †

Economic application and utilization of electric power on farms and in rural communities. Prerequisite: Agricultural Engineering 418.

440. Farm Electrification. (3-0). Credit 3. S †

This course includes the fundamentals of farm wiring and lighting and the design, construction, and operation of electric water systems, refrigeration equipment, brooders, milking machines, feed processing and handling equipment, hay and grain driers, and other electric equipment used in farm production. This is a special three-weeks course for teachers and prospective teachers in vocational agriculture to be offered for a three-weeks period during the summer.

442. Irrigation. Credit 2 to 4. S †

A special intensive semi-technical field course for county agricultural agents or similar groups, and including water supply sources, pumping, measurement, distribution and application of water for various crops, mapping and field preparation for irrigation, soil types and moisture relationships, and other problems related to effective and efficient irrigation practices.

FOR GRADUATES

601, 602. Drainage and Irrigation. (3-3). Credit 4 each semester. I, II

Advanced study of farm drainage and irrigation with special emphasis on recent developments. Prerequisite: Agricultural Engineering 410.

603, 604. Mechanical Farm Equipment. (3-3). Credit 4 each semester. I, II

Advanced study of farm machinery and equipment with special emphasis on recent developments. Prerequisite: Agricultural Engineering 208.

605, 606. Farm Structures. (2-6). Credit 4 each semester. I, II

Advanced study of farm buildings and farm home utilities. Prerequisites: Agricultural Engineering 205, 413, 418.

609, 610. Farm Power. (2-6). Credit 4 each semester. I, II

Advanced study of farm power with special emphasis on recent developments. Prerequisites: Agricultural Engineering 323, 324.

611. Farm Mechanics and Farm Shop. (3-3). Credit 4. I

Advanced study of farm shop with special emphasis on problems relative to teaching the course; i.e., equipment, methods, supplies, and projects. Prerequisites: Agricultural Engineering 221, 222, 331.

613, 614. Soil and Water Conservation Engineering. (3-3). Credit 4 each semester. I, II

The advanced study of the design and construction of terraces, outlet channels, and other structures used for soil and water conservation, with special emphasis on late developments. Prerequisite: Agricultural Engineering 428.

685. Problems. Credit 1 to 4 each semester. I, II

Advanced laboratory or field problems not related to student's thesis. Prerequisite: Graduate classification.

691. Research. Credit 1 or more each semester. I, II

Research for the thesis or dissertation.

Department of Agronomy

Professor J. E. Adams,
Professors H. E. Hampton, J. S. Mogford, J. B. Page; Associate Professors H. D. Foth, T. E. McAfee, R. C. Potts; Assistant Professor G. W. Kunze; Instructors J. F. Mills, C. E. Watson

105. Fundamentals of Crop Production. (2-2). Credit 3. I, II

Classification and distribution of farm crops; importance of good varieties and good seed; crop improvement; preparation of the seed bed; commercial fertilizers; manures and lime; seeding practices; crop tillage; harvesting; meadow and pasture management; weeds; crop rotation; diseases and insect enemies.

301. Introductory Soils. (3-2). Credit 4. I, II, S

A general introductory course designed to acquaint the student with some physical, chemical, and biological properties of the soil. Prerequisite: Chemistry 102.

308. Forage Crops. (2-2). Credit 3. I, II, S

The production, utilization, and identification of the major forage crop plants with emphasis on adapted species and varieties for the Southwest. Prerequisites: Agronomy 105, 301; Biology 101.

309. General Soils. (3-0). Credit 3. I

A course dealing with soils in a non-technical manner, treating it as a universal and irreplaceable natural resource. The course is designed for students who do not have the prerequisites for Agronomy 301. IT CANNOT BE SUBSTITUTED FOR AGRONOMY 301.

314. Cereal Crops. (2-2). Credit 3. I

The classification, production, harvesting, and utilization of corn, wheat, oats, barley, rice, rye, grain sorghums, and flax seed together with a study of the various species and varieties of the crops mentioned. Prerequisites: Agronomy 105, 301; Biology 101.

315. Cotton Production. (2-2). Credit 3. I

History, distribution, and consumption of cotton, and a study of species, varieties, improvements, adaptation, fertilization, tillage practices, insects, diseases, harvesting, ginning, and economics of production. Flax, hemp, and other miscellaneous fiber crops are treated briefly. Prerequisites: Agronomy 105; Biology 101.

316. Commercial Grading of Grain and Hay. (1-3). Credit 2. II

The commercial grading of hay and the grains for which Federal Standards have been established. Ways and means of improving quality to meet the trade requirements are covered. Prerequisite: Agronomy 105.

317. Weed Control. (2-2). Credit 3. II

Identification, physiology, and ecology of weeds and methods used for their control. Prerequisite: Agronomy 301.

319. Seed Quality. (1-2). Credit 2. I

A study of the important agronomic crop seeds with emphasis on harvesting, cleaning, grading, and storage as they influence quality of planting seed. Prerequisites: Agronomy 105; Biology 101.

410. Soil Morphology. (1-4). Credit 2. II †

Field study of the morphological features of the soil profile in relation to soil utilization and management. Soil development, classification, and mapping are also covered. Prerequisite: Agronomy 301.

413. Soil and Crop Management. (3-0). Credit 3. II †

A study of the special problems in the utilization and management of soils and crops under varying soil and climatic conditions. Independent work in solving current agronomic problems in different parts of the Southwest required. Prerequisites: Agronomy 301; senior classification.

415. Agronomy Seminar. (1-0). Credit 1. I, II

The preparation and presentation by the students of papers on pertinent agronomic topics. Required of all agronomy majors in their last semester. Prerequisite: Senior classification in agronomy.

417. Pasture Management. (2-2). Credit 3. I, II †

Adaptation and management of native and introduced pasture plants; their establishment, production, utilization, and maintenance in permanent and temporary pastures. Field trips are required. Prerequisites: Agronomy 301, and either Agronomy 308, Biology 346, or Range and Forestry 303.

418. Soil Conservation. (3-3). Credit 4. I, II, S †

A course dealing with the importance of soil conservation from the standpoint of different soil types in the agricultural regions of Texas and the United States. Conservation methods are presented according to climatic regions, cropping systems, topographic locations, and other influencing factors. Field practice in the making of a map of a farm, its soil, and a plan of reorganization for soil conservation. Prerequisite: Agronomy 301.

422. Soil Fertility. (3-4). Credit 4. I, S †

An advanced course dealing with the more technical consideration of the physical, chemical, and biological factors influencing the crop producing power of the soil. Prerequisites: Agronomy 301; Chemistry 223, 231; Plant Physiology and Pathology 313.

426. Fertilizer Technology. (2-0). Credit 2. II

A study of the problems of the manufacture, storage, and application of commercial fertilizers, including a limited number of required field trips to various types of fertilizer plants. Prerequisites: Agronomy 301; 14 hours of chemistry and/or physics.

436. Soil and Crop Problems for Professional Workers. (3-0). † Credit 3. S

This is a vocational course, with application of currently available information to the problems of farming. Not for agronomy majors.

443. Soil Microbiology. (2-3). Credit 3. II †

A study of the occurrence of microorganisms in the soil and the biochemical transformations for which they are responsible. Prerequisite: Agronomy 301; Biology 206. (Offered in 1955-56 and in alternate years thereafter)

445. Soil Physics. (2-3). Credit 3. II †

A study of the fundamentals of soil physics and their application to the solution of problems in crop production, irrigation, and engineering. Prerequisites: Nine hours of soils and physics, with a minimum of 3 hours of each (may include soil mechanics).

451. Forage and Pasture Production. (2-2). Credit 3. S †

An intensive course covering the identification of forage species, their establishment and management for pasture, seed, hay or silage production. For professional agricultural workers or by approval of instructor. Not for graduate majors in agronomy.

485. Problems. Credit 1 or 2. I, II, S

A course for advanced undergraduates to permit field or laboratory investigations or the study of subject matter not included in established courses. Prerequisites: Ten hours of junior and senior agronomy.

FOR GRADUATES

601. Advanced Cereal Crops. (3-4). Credit 4. II

An advanced study of cereal production and breeding, including a review of investigations in this field.

602. Advanced Forage Crops. (3-4). Credit 4. I

An advanced study of forage production and breeding, including a review of investigations in this field.

605. Pedology. (3-0). Credit 3. I

An advanced study of the development, morphology, constitution, and classification of soils.

608. Advanced Cotton Production. (3-3). Credit 4. II

An advanced study of cotton from the standpoint of species, varieties, breeding, fertilization, tillage practices, and harvesting. An extensive survey of cotton literature is a part of the course. (Offered in 1954-55 and in alternate years thereafter)

617. Advanced Soil Physics. (3-3). Credit 4. I

The physical constitution and properties of soil, including consistence and structure, aeration, soil water, and thermal relationships. Prerequisites: Agronomy 445 or the equivalent and a two-semester course in physics. (Offered in 1955-56 and in alternate years thereafter)

618. Advanced Soil Analysis. (2-3). Credit 3. II

A course designed to familiarize the student with the more difficult problems of soil analysis and the interpretation of the data. Prerequisite: Agronomy 422. (Offered in 1955-56 and in alternate years thereafter)

624. Physical Chemistry of Soils. (3-3). Credit 4. I

The physical chemistry of the clay mineral and the inorganic and organic soil colloids. Prerequisites: Agronomy 617, 618; Chemistry 323, 324. (Offered in 1954-55 and in alternate years thereafter)

626. Soil Mineralogy. (3-3). Credit 4. II

A study of the crystal structures and properties of the more important agricultural and industrial clays combined with identification techniques involving X-rays, differential thermal analysis, and electron microscopy. (Offered in 1954-55 and in alternate years thereafter)

681. Seminar. (1-0). Credit 1 each semester. I, II
A seminar including advanced students and staff members in soils and crops. Presentation and discussion of special topics and research data in the field of agronomy. Participation is required of all graduate students in agronomy.

685. Problems. Credit 1 or 2 each semester. I, II, S
Advanced problems in some phase of agronomy not directly related to the thesis or dissertation.

691. Research. Credit 1 or more each semester. I, II, S
Investigations leading to the thesis or dissertation.

Department of Air Science and Tactics

J. A. Way, Colonel, USAF
Professor of Air Science and Tactics

United States Air Force

Associate Professors: Lieutenant Colonel W. J. Hall; Majors W. F. Burt, O. H. Franks, B. L. Hoyl, H. O. Johnson, J. C. Lowell, J. S. McCannon, L. J. Westbrook; Assistant Professors: Captains R. P. Cowart, C. B. Doleac, J. N. Hoffman, T. P. Mitchell, B. E. Paschal, R. G. Phillips, E. W. Rodgers; Instructors: Master Sergeants J. P. Collins, M. L. Daniel, H. M. Drake, E. R. McNutt, J. W. Tenery, C. L. Thompson, T. H. Williams; Technical Sergeants T. M. Buford, III, C. E. Perdue, R. M. Roller; Staff Sergeant A. R. Tanksley

AF ROTC Generalized Course of Study
Basic Course of Air Science

All students are required, unless excused by proper authority, to take first and second year basic military or air science.

141. First Year Basic Air Science. (0-3). Credit 1. I
Theoretical: Introduction to AF ROTC; introduction to aviation; fundamentals of global geography; international tensions and security organizations; and instruments of national military security.
Practical: Drill—basic military training.

142. First Year Basic Air Science. (0-3). Credit 1. II
A continuation of Air Science 141.

241. Second Year Basic Air Science. (0-3). Credit 1. I
Theoretical: Elements of aerial warfare; and careers in the USAF.
Practical: Leadership laboratory—cadet non-commissioned officer training.

242. Second Year Basic Air Science. (0-3). Credit 1. II
A continuation of Air Science 241.

Advanced Course of Air Science

341. First Year Advanced Air Science. (2-3). Credit 3. I
Theoretical: Introduction to advanced Air Force ROTC; the AF commander and staff; problem solving techniques; communications process and AF correspondence; military justice system; applied air science; AF base functions.
Practical: Leadership training laboratory.

342. First Year Advanced Air Science. (2-3). Credit 3. II
A continuation of Air Science 341.

441. Second Year Advanced Air Science. (2-3). Credit 3. I

Theoretical: Camp critique; principles of leadership and management (seminar); career guidance; military aspects of world political geography; military aviation and the art of war; briefing for commissioned service.
Practical: Leadership training laboratory.

442. Second Year Advanced Air Science. (2-3). Credit 3. II

A continuation of Air Science 441.

Department of Animal Husbandry

Professor J. C. Miller,
Professors R. O. Berry, F. I. Dahlberg, Fred Hale; Associate Professors O. D. Butler, Jr., J. K. Riggs, G. L. Robertson, W. M. Warren; Assistant Professors W. G. Kammlade, Jr., H. O. Kunkel; Instructors D. L. Handlin, G. T. King

107. General Animal Husbandry. (2-3). Credit 3. I, II

An introductory survey course stressing the importance of livestock and livestock farming. General factors influencing efficiency in feeding, market value, breeding, health, and adaptability of various species to geographical and climatic regions are emphasized.

202. The Breeds of Farm Animals. (2-2). Credit 3. I, II

The place of origin and early development of breeds of cattle, horses, sheep, and swine; constructive breeders; adaptability; distribution; breed type and characteristics; breed organizations; publications; score card and comparative judging of representative animals. Prerequisite: Animal Husbandry 107.

303. Animal Nutrition. (3-0). Credit 3. I, II, S

Chemical composition of feeding stuffs; composition of farm animals, digestion; metabolism; functions of nutrients; vitamins; coefficients of digestibility; energy in feeds and its uses; feed requirements of animals; maintenance; growth, fattening; milk production; wool production; work; nature and uses of feed stuffs. Prerequisite: Chemistry 231.

307. Meats. (2-3). Credit 3. I, II

Study and practice of slaughtering and cutting carcasses of cattle, sheep, and hogs. Meat will be cured and meats products prepared. Uses of by-products will be considered. Methods of handling meats on the farm or ranch will be covered. Factors affecting quality, palatability, and economy in selection of meats will be included. The location, structure, and functions of the endocrine glands, digestive organs, and reproductive organs will be discussed in the laboratory in connection with slaughtering. Prerequisite: Animal Husbandry 107.

315. Livestock Judging. (1-3). Credit 2. I

A detailed consideration of the factors involved in the selection and grading of livestock for both breeding and slaughter purposes.

317. Meats Judging. (1-3). Credit 2. I

A detailed consideration of the factors involved in the selection and grading of carcasses and wholesale cuts of beef, pork, and lamb. Prerequisite: Junior classification.

320. Animal Nutrition and Feeding. (3-0). Credit 3. II

A review of the chemical aspects of animal nutrition. The role of carbohydrates, fats, proteins, vitamins, and minerals in animal nutrition. Nutritional requirements of farm animals. Formulation of rations. A study of feeds and feedstuffs which supply the nutritional requirements. For students of veterinary medicine. Prerequisite: Biochemistry and Nutrition 312.

406. Beef Cattle Production. (2-2). Credit 3. I, II, S †

The world population and distribution of beef cattle; systems of production; location of beef enterprise; establishment of the herd; improvement methods; mating and reproduction; calving; feed and care of calf; development of stock for breeding herd; wintering; summer management; cattle feeding; selection of feeds; value of feeds; financial aspect of beef production; equipment; parasites and diseases; fitting and showing; marketing. Prerequisite: Animal Husbandry 303.

409. Feeds and Feeding. (2-2). Credit 3. I, II

A course designed to cover plans for feeding all classes of farm animals from a practical point of view; application of principles of nutrition; computing rations; economics of livestock feeding; flexible feeding programs; utilization of by-product feedstuffs; feeding investigations; feed control laws; animal feed budgets. Prerequisite: Animal Husbandry 303.

410. Sheep and Angora Goat Production. (2-2). Credit 3. I, II †

Present status; methods and types of sheep raising; pure bred business; breeding, management, and feeding of the breeding flock; growing young lambs; fattening sheep and lambs; marketing sheep and lambs; fitting and showing; parasites and diseases. Prerequisite: Animal Husbandry 303.

412. Swine Production. (2-2). Credit 3. I, II, S †

Historical; feeding and handling the breeding herd during various seasons; culling; records; the sow and the litter; growing and fattening pigs; forage crops; feeding on forage; dry lot feeding; choice and value of feeds; garbage disposal plants; prevention of disease; the pure bred herd; fitting and showing. Prerequisite: Animal Husbandry 303.

413. Horse Production. (2-2). Credit 3. II †

Review of situation; historical development; mechanical versus horsepower; anatomy; unsoundness, ailments and diseases; feeding the brood mare; stallions; growing and developing colts; feeding and handling horses at work; stables and equipment; harness; shoeing; fitting and showing; quarter horse breeding and training; horse markets. Prerequisite: Animal Husbandry 303.

416. Livestock Management. (2-2). Credit 3. I, II

A course in the feeding and management of beef cattle, sheep, swine, and horses. Especially designed for agricultural education majors. Prerequisite: Animal Husbandry 303.

418. Wool and Mohair. (2-2). Credit 3. II †

Microscopic structure; chemical composition; characteristics; preparation for market; market reports; marketing; computation of values; comparison with other textile materials; wool and mohair judging; wool and mohair appraisal. Prerequisites: Junior classification; approval of Head of Department.

427. Seminar. (1-0). Credit 1. I, II

A review of current literature and research problems related to the livestock industry. Prominent men in the field of animal husbandry may be invited to conduct the seminar. For senior students in animal husbandry.

433. Reproduction in Farm Animals. (2-3). Credit 3. I, II †

Anatomy and physiology of the male and female reproductive tract; hormones governing reproduction; pregnancy tests; estrus and the estrus cycle; ovulation, mating; gestation; parturition; lactation; sperm physiology; collection, storage, and dilution of semen; artificial insemination; factors affecting fertility; causes of sterility in males and females. Prerequisite: Senior classification or approval of Head of Department.

436. Advanced Livestock Management. Credit 3. S †

A special three-weeks workshop course for teachers of vocational agriculture to be offered during the summer. This course includes problems in all phases of animal production selected by the group under the supervision of the instructor.

437. Marketing and Grading of Livestock and Meats. (2-2). Credit 3. I, II

Factors determining market classes and grades of feeder, stocker, and slaughter animals; grading feeder, stocker, and slaughter animals; marketing machinery and handling market livestock; purebred sales; shipping losses; shrinkage; fills. Prerequisite: Senior classification.

440. Sheep and Wool Production Problems. (2-3). Credit 3. S

Latest developments in the feeding, breeding, and management of the sheep flock including the production, harvesting preparation for market, and marketing of the wool clip. Special summer course for agricultural agents.

442. Advanced Livestock Judging. (0-3). Credit 1. II

An advanced course in the selection and grading of livestock and meats. Prerequisites: Animal Husbandry 315; approval of Head of Department.

444. Large Animal Nutrition. (3-0). Credit 3. II †

Review of elementary chemistry of carbohydrates, proteins, and fats, with particular emphasis on the role of these constituents in large animal nutrition. A comparison of the nutrition of the ruminant to that of the monogastric animal. A study of the secretions (enzymatic and hormonal) of large animals and the function of each. The efficiency of each class of animals with regard to converting feed into fats, meat, wool, and work. Prerequisite: Animal Husbandry 303 or approval of Head of Department.

445. Problems. Credit 1 to 4. I, II

A directed individual study of a selected problem in the field of animal husbandry. Prerequisites: Senior classification; approval of the Head of the Department.

447. Advanced Meats Judging. (0-3). Credit 1. II

An advanced course in the selection and grading of carcasses and wholesale cuts of beef, pork, and lamb. Prerequisites: Animal Husbandry 317; approval of the Head of the Department.

450. Meat Technology. (2-3). Credit 3. II †

A study of the production and disposition of packinghouse products with emphasis on quality control analyses. Chemical, bacteriological, and organoleptic laboratory tests will be made. Sanitation including use of detergents, antiseptics, and disinfectants will be studied. Prerequisites: Animal Husbandry 307; Biology 206; Chemistry 223, 231.

FOR GRADUATES

605, 606. Advancements in Beef Cattle Production. (3-0). Credit 3 each semester. I, II

A comprehensive review of recent advances in research relative to the various phases of beef cattle production; the application of the basic principles of nutrition, animal breeding, and disease control to the feeding, breeding, and management of beef cattle. Prerequisites: Animal Husbandry 406; Genetics 306; or approval of Head of Department.

619, 620. Advancements in Sheep and Angora Goat Production. (3-0). Credit 3 each semester. I

A comprehensive review of recent advances in research relative to the various phases of sheep and angora goat production; the application of the basic principles of nutrition, animal breeding, and disease control to the feeding, breeding, and management of sheep and angora goats. Prerequisites: Animal Husbandry 410; Genetics 306; or approval of Head of Department.

621, 622. Advancements in Swine Production. (3-0). Credit 3 each semester. II

A comprehensive review of recent advances in research relating to the various phases of swine production; the application of the basic principles of nutrition, animal breeding, and disease control to the feeding, breeding, and management of hogs; fitting swine production to the whole farm enterprise; special problems relating to the planning and operation of swine production units. Prerequisites: Animal Husbandry 412; Genetics 306; or approval of Head of Department.

631. Physiology of Reproduction. (2-0). Credit 2. II

A critique of scientific literature concerning the processes of reproduction in farm mammals. Students will compile, evaluate, and summarize the literature on various phases of this subject. Consideration will be given to special problems on which further investigations are desirable and methods of outlining research projects for them. Prerequisite: Animal Husbandry 433.

681. Seminar. (1-0). Credit 1 each semester. I, II

Important current developments in the field of animal husbandry. Review of current literature and presentation of papers on selected animal husbandry topics. Prerequisites: Graduate classification; major in animal husbandry or genetics.

685. Problems. Credit 1 to 4 each semester. I, II, S

Advanced studies in animal husbandry problems and procedures. Problems assigned according to the experience, interest, and needs of the individual student. Registration by approval of Head of Department. Prerequisite: Graduate classification.

691. Research. Credit 1 or more each semester. I, II, S

Investigations leading to the student's thesis or dissertation in the fields of animal production, meats, wool and mohair, nutrition, inheritance of farm animals, and physiology of reproduction. Prerequisite: Graduate classification.

Department of Architecture

Professor Ernest Langford;
Associate Professors T. R. Holleman, M. M. Rotsch; Assistant Professors H. L. Hornbeak, F. D. Lawyer, K. F. Robinson, G. K. Vetter, Richard Vrooman; Instructors J. A. Davis, H. W. Gooding, J. H. Lemmon

101. Architecture I. (0-9). Credit 3. I
Basic principles of design and composition; sketching, techniques of presentation.

102. Architecture I. (0-9). Credit 3. II
Architectural projections, perspective, beginning design. Prerequisite: Architecture 101 or equivalent.

201. Architecture II. (0-15). Credit 5. I
Elementary design; techniques of presentation, simple problems in planning. Prerequisite: Architecture 102.

202. Architecture II. (0-15). Credit 5. II
Elementary design; detailed planning, with attention to construction; materials and techniques of presentation. Prerequisite: Architecture 201.

205. Freehand Drawing. (0-3). Credit 1. I
Basic techniques of freehand drawing; sketching and drawing in various media.

206. Freehand Drawing. (0-3). Credit 1. II
Freehand drawing with emphasis placed on more advanced techniques of sketching and drawing in various media. Prerequisite: Architecture 205 or equivalent.

228. Elements of Mechanics. (3-0). Credit 3. II
Force systems, composition and resolution of forces, resultant equilibrium; centers of gravity; analysis of simple frames. Prerequisite: Mathematics 223.

301. Architecture III. (0-18). Credit 6. I
Intermediate design, with emphasis on plan, arrangement, and construction; materials and techniques of presentation; methods of construction. Prerequisite: Architecture 202.

302. Architecture III. (0-18). Credit 6. II
Further studies in intermediate design with emphasis on plan, arrangement, and construction; materials and techniques of presentation; methods of construction. Prerequisite: Architecture 301.

305. Freehand Drawing. (0-3). Credit 1. I
Fundamentals of color and still life, sketching. Prerequisite: Architecture 206.

306. Freehand Drawing. (0-3). Credit 1. II
Advanced work in water colors and other media. Prerequisite: Architecture 305.

327. Construction I. (3-0). Credit 3. I
Fundamentals of strength of materials and their application in architectural construction. Prerequisite: Architecture 228.

328. Construction I. (3-0). Credit 3. II
A study of the systems of framing in architectural construction; analysis and design in wood and steel. Prerequisite: Architecture 327.

329. Art and Civilization. (2-0). Credit 2. I
Historical survey of the cultures of man with respect to art and architecture. Prerequisite: Junior classification.

330. Art and Civilization. (2-0). Credit 2. II
The development of great periods of civilization; their influence on architecture as an art and as a profession. Prerequisite: Junior classification.

353. Technology of Materials. (2-0). Credit 2. I

Materials of construction, their properties, characteristics, and uses. Prerequisite: Junior classification.

354. Technology of Materials. (2-0). Credit 2. II

Selection of materials, methods of construction, quantity surveys, estimating, outline of specifications. Prerequisite: Junior classification.

401. Architecture IV. (0-18). Credit 6. I

Advanced design; major projects in building design and construction. Prerequisite: Architecture 302.

402. Architecture IV. (0-18). Credit 6. II

Advanced design; major projects dealing with more complex building types. Prerequisite: Architecture 401.

427. Construction II. (2-2). Credit 3. I

A study of the systems of framing in architectural construction; analysis and design in reinforced concrete. Prerequisite: Architecture 328.

428. Construction II. (2-2). Credit 3. II

Graphical analysis of roof framing systems; evaluation of loads on trusses; truss design. Prerequisite: Architecture 328.

429. History of Architecture. (3-0). Credit 3. I

Study of the development of pre-classic and classic architecture and of the historical development of buildings through the Gothic period. Prerequisite: Architecture 330 for students in architecture; senior classification for others.

430. History of Architecture. (3-0). Credit 3. II

Study of the development of architecture from the Gothic period forward; influences and trends; structural and esthetic factors in the development of contemporary buildings. Prerequisite: Architecture 429.

454. Specifications and Working Drawings. (1-6). Credit 3. I, II

Detailed specifications; supervision and superintendence; building laws and codes; working drawings. Prerequisite: Senior classification.

500. Summer Practice. Twelve weeks; required; no credit. S

Summer practice in architectural offices or with building contractors as the student may be registered in Option I or Option II. Required previous to registration for fifth year.

501. Architecture V. (0-18). Credit 6. I †

Advanced design; major projects in community and regional planning. Prerequisite: Architecture 402.

502. Architecture V. (0-18). Credit 6. II †

Advanced design; major projects in the design of buildings and groups of buildings. Prerequisite: Architecture 501.

527. Construction III. (2-3). Credit 3. I †

Advanced studies in the systems of architectural construction. Prerequisite: Architecture 428.

528. Construction III. (2-3). Credit 3. II †

Individual problems in the systems of architectural construction; materials and methods of construction; preliminary surveys of costs. Prerequisite: Architecture 527.

550. Seminar. (1-0). Credit 1. II

Oral presentation of selected topics from current literature in the fields of architecture and building construction. Prerequisite: Fifth year classification.

554. Professional Practice. (2-0). Credit 2. I, II †

Office practice: professional relations and ethics; building law, contracts. Prerequisite: Senior classification.

556. City Planning. (2-3). Credit 3. II †

Survey of planning principles and procedures; legal aspects; physical and social development of the city; housing. Prerequisite: Senior classification.

FOR GRADUATES

629, 630. History and Archaeology (2-0). Credit 2 each semester. I, II

Individual problems of study and research in the field of American architecture and archaeology.

681. Seminar. (1-0). Credit 1 each semester. I, II, S

Review of current work in architecture; original presentations on selected topics.

685. Problems. Credit 1 to 4. I, II, S

Individual problems involving the application of theory and practice in the design and construction of buildings and groups of buildings.

691. Research. Credit 2 to 4 each semester. I, II, S

Research for thesis.

BASIC DIVISION

Dean J. R. Bertrand;
Associate Professors A. J. Kingston, C. H. Ransdell; Assistant Professors S. A. Kerley, F. E. McFarland; Instructors A. E. Denton, C. E. George, W. D. Kutach, R. E. Miller

101. Orientation. (0-2). Credit 1. I, II

Designed to assist the student in (1) the process of making adequate personal and social adjustment to college life, (2) the recognition and development of his aptitudes, interests, and abilities, and the selection of attainable life goals, and (3) becoming acquainted with the scope of the curricula and vocational opportunities in the fields of specialization offered by the College.

102. Remedial Reading. (0-3). Credit 1. I, II, S

A laboratory course designed to remedy a student's reading disability and to increase his reading rate and comprehension. In addition to the regular two one-hour meetings per week, two thirty-minute practice periods are required.

103. College Study. (0-2). Credit 1. I, II

A laboratory course designed to familiarize the student with the principles of learning and to relate them to the study of specific school subjects.

104. Individual Adjustment. (0-2). Credit 1. I, II

A course designed to help the student to understand himself and the nature of the society of which he is a member.

105. The World of Work. (0-2). Credit 1. I, II

A course designed to familiarize the student who has not decided upon a vocational goal with the demands, required skills, and rewards of various occupational areas. Most of the major occupational areas will be studied intensively, and each student will be given an opportunity for studying his aptitudes and interests and relating them to various vocational requirements.

106. Survey of Man's Knowledge. (0-2). Credit 1. II

A survey course designed to acquaint the student with the various schools of thought and the many areas of knowledge which comprise our culture. Such disciplines as philosophy, social and physical sciences, religion, law, and literature will be investigated.

107. The Engineering Profession. (0-2). Credit 1. II

Extensive information about the broad general profession of engineering and intensive information about the specific branches of engineering.

Department of Biochemistry and Nutrition

Professor C. M. Lyman,
Professors J. R. Couch, L. R. Richardson; Associate Professor Raymond Reiser; Assistant Professors H. O. Kunkel, J. M. Prescott, Jr.

312. Veterinary Physiological Chemistry. (3-6). Credit 5. I

A study of the chemical nature of physiological processes, including the synthesis and breakdown of body tissues and the chemical changes undergone by metabolites from ingestion to excretion. Variations among domestic animals in normal and abnormal conditions will be considered. Prerequisites: Chemistry 216, 302.

401. Human Nutrition. (3-0). Credit 3. I †

A study of the functions of food constituents in health and in physiological stress. The economics, national, and international aspects of human nutrition. Prerequisite: Chemistry 231 or 302.

410. Introductory Biochemistry. (3-3). Credit 4. II †

The chemistry of the major constituents of living organisms. Biophysical and biochemical processes in plants and animals are stressed. The laboratory work includes the application of quantitative analytical procedures to plant and animal tissues and fluids. Prerequisites: Chemistry 223 and 231 or 302.

Animal Husbandry 444. Large Animal Nutrition. (3-0). Credit 3. II †

See page 260 for a full description of this course.

Poultry Husbandry 411. Poultry Feeding. (3-2). Credit 4. I †

See page 362 for a full description of this course.

FOR GRADUATES

601. Biochemistry of Plants. (3-0). Credit 3. I

A study of the major groups of organic compounds occurring in plants with emphasis on their biological synthesis, physiological function, and changes in chemical structure due to metabolic processes. Prerequisite: Biochemistry and Nutrition 410 or 611 or Chemistry 444 or 446. (Offered in 1955-56 and in alternate years thereafter.)

611. General Biochemistry. (3-0). Credit 3. I

A consideration of the chemical constituents and reactions of living cells. Particular emphasis is given to the metabolism and nutritional significance of proteins, carbohydrates, and lipids. Prerequisite: Chemistry 302.

612. Laboratory Procedures in Biochemistry. (0-6). Credit 2. I

A laboratory course designed to familiarize the student with the application of chemical and biological methods to the solution of fundamental biochemical problems. Prerequisite: Biochemistry and Nutrition 611 or registration therein.

613. Vitamins and Minerals. (3-0). Credit 3. II

The role of vitamins and minerals in animal nutrition and their occurrence in plant and animal tissues. Prerequisite: Chemistry 302.

614. The Determination of Vitamins and Minerals. (0-3). Credit 1. II

A laboratory course designed to familiarize the student with methods for the determination of vitamins and minerals in biological materials. Prerequisite: Biochemistry and Nutrition 613 or registration therein.

615. Experimental Animal Procedures. (0-3). Credit 1. II

A laboratory course involving the management, preparation of purified rations, and the production and cure of nutritional diseases. Prerequisites: Biochemistry and Nutrition 613, 614 or registration therein.

618. Chemistry and Metabolism of Lipids. (2-3). Credit 3. II

An advanced course in lipid chemistry and metabolism. The laboratory exercises will cover standard procedures used in the fats and oil industry and special methods used in studies of lipid metabolism. Prerequisite: Biochemistry and Nutrition 611 or Chemistry 443. (Offered in 1955-56 and in alternate years thereafter.)

619. Proteins and Enzymes. (2-0). Credit 2. II

Advanced studies on the chemical, physical, and biological properties of proteins and enzymes. The intermediary metabolism of amino acids, the chemistry of enzyme action. Prerequisite: Biochemistry and Nutrition 611 or Chemistry 443. (Offered in 1954-55 and in alternate years thereafter.)

620. Advanced Biochemical Techniques. (0-6). Credit 2. S

A laboratory course involving practice in the use of special techniques and instruments employed in biochemical research and the isolation, identification, and analysis of biological compounds. Preparation of representative enzymes and laboratory work on factors affecting their action. Prerequisites: Biochemistry and Nutrition 612, 619 or registration therein; Chemistry 324 or 342. (Offered in 1954-55 and in alternate years thereafter.)

681. Seminar. (1-0). Credit 1 each semester. I, II

The study and discussion of original articles in biochemistry and nutrition and related fields designed to broaden the understanding of problems in the field and to stimulate research.

685. Problems. Credit 1 or more each semester. I, II

An advanced course in biochemical laboratory procedures including preparations and instrumentation. Problems assigned according to the experience, interests, and needs of the individual student.

691. Research. Credit 1 or more each semester. I, II

Research for thesis or dissertation. Laboratory facilities are available for original investigations in various phases of biochemistry and nutrition. Prerequisite: Approval of major advisor.

Department of Biology

Professor C. C. Doak,
Professors S. O. Brown, L. L. Gee, S. H. Hopkins, Charles LaMotte, G. E. Potter, J. J. Sperry; Associate Professors W. J. Dobson, E. H. Gibbons, H. L. Gravett; Assistant Professors L. S. Dillon, T. M. Ferguson*, A. B. Medlen, John Merkle, H. D. Thiers, W. L. Tidwell; Instuctors R. J. Baldauf, J. F. Mangrum, R. W. Menzel

Courses in the biological sciences administered by the Department of Biology include sequential programs in bacteriology, botany, and zoology. All courses, irrespective of subject matter area, bear the departmental designation (Biology) and a course number from a single numerical sequence. The nature of the offerings is more clearly indicated, however, by the subject matter grouping shown on following page.

GENERAL BIOLOGY

115. Survey of Biology. (3-3). Credit 4. I, II

A summarization of biological forms and principles and their impact upon man and his affairs.

419. Seminar in Biology. (1-0). Credit 1. I †

Recent advances. For graduates and advanced undergraduate majors in either bacteriology, botany, or zoology. May be repeated once for credit not to exceed two hours.

420. Seminar in Biology. (1-0). Credit 1. II †

Integration of the branches of biological science. May be repeated once for credit not to exceed two hours.

437. Biological Problems. Credit 1 or 2. I, II

Problems in the various phases of plant, animal, and bacteriological science. Prerequisites: Junior classification; approval of ranking professor in field chosen.

*On leave of absence.

FOR GRADUATES

681. Seminar. (1-0). Credit 1. I, II

Detailed reports on specific topics in the field chosen. Prerequisite: Graduate classification in the appropriate field.

685. Problems. Credit 1 to 4 each semester. I, II

Limited investigations in fields other than those chosen for thesis or dissertation.

691. Research. Credit 1 or more each semester. I, II

Research for thesis or dissertation. Prerequisite: Approval of ranking professor in the field chosen.

BACTERIOLOGY

206. Introductory Bacteriology. (2-4). Credit 3. I, II

Nature of bacterial relation to agriculture, industry, sanitation, and health of man, animals, and plants. Prerequisites: Chemistry 102; 8 hours of biology.

224. General Microbiology. (3-3). Credit 4. II

The cultural and physiological characteristics of the important groups of microorganisms. With emphasis placed on technics and procedures. Prerequisite: Biology 206. (Offered in 1955-56 and in alternate years thereafter.)

225. Personal and Public Health. (2-0). Credit 2. I

A general introduction to personal and community health. Designed primarily to enable the individual to utilize available knowledge and facilities to raise the health standard of his home and community.

323. Systematic Bacteriology. (1-6). Credit 3. I †

Relation of bacteria to other microorganisms and to each other. Methods of isolation, identification, and differentiation. Prerequisite: Biology 206. (Offered in 1954-55 and in alternate years thereafter)

451. Survey of Biological Warfare. (1-0). Credit 1. I, II

A general introduction to the possible agents of biological warfare, logical methods of use, and defensive methods available to minimize effects. Prerequisite: Senior classification.

455. Pathogenic Microbiology. (3-3). Credit 4. I †

The study of the theories of infection and resistance and of the important pathogenic microorganisms for man. Practice consists of a study of the morphological, physiological, and immunologic characteristics of these pathogens. Prerequisite: Biology 206 or the equivalent. (Offered in 1955-56 and in alternate years thereafter.)

Dairy Husbandry 320. Bacteriology of Dairy Products. (3-3). Credit 4. I †

See page 289 for a full description of this course.

Dairy Husbandry 326. Food Preservation and Decomposition. (3-3). Credit 4. II †

See page 289 for a full description of this course.

FOR GRADUATES

635. Physiology of Bacteria. (2-6). Credit 4. I

A detailed study of the physiological and biochemical activities of bacteria. Prerequisite: Six credit hours in bacteriology and organic chemistry. (Offered in 1954-55 and in alternate years thereafter.)

647. Industrial Microbiology. (2-6). Credit 4. I

Microorganisms as the basis of industrial processes. Prerequisite: Six credit hours in bacteriology. (Offered in 1955-56 and in alternate years thereafter.)

BOTANY

101. General Botany of Seed Plants. (2-3). Credit 3. I, II

The seed plant as a living unit; external and internal structures in relation to life processes; reproduction and life history.

102. Taxonomy of Flowering Plants. (2-3). Credit 3. II

Designed to give training in the use of keys and in the identification of flowering plants, family characteristics and relationships, and other applied phases of plant science. Prerequisite: Biology 101.

327. Fundamental Plant Morphology. (2-3). Credit 3. I

Structural, reproductive, and taxonomic features of representatives of the major plant groups, with particular attention to groups not covered in Biology 101. Prerequisite: Biology 101.

346. Systematic Botany. (2-6). Credit 4. II †

Principles of identification and classification of seed plants; stress on nomenclature, family characteristics, and systems of classification. Designed for botanists and others who plan to continue in plant science. Prerequisite: Biology 101. (Offered in 1954-55 and in alternate years thereafter.)

349. Field Taxonomy. (2-3). Credit 3. S

Study and identification of the flora of selected areas, technique of collection and preparation of plant specimens. Studies in plant distribution and relationships. Prerequisite: Biology 102 or 346.

353. Mycology. (2-3). Credit 3. I †

An introduction to the study of fungi, including structure, reproduction, ecological relationships, and taxonomic aspects. Emphasis on forms of special significance to commercial processes, plant diseases, antibiosis, and fermentation. Prerequisite: Biology 101, 206, or approval of instructor. (Offered in 1955-56 and in alternate years thereafter.)

453. Plant Anatomy. (2-3). Credit 3. I

Fundamental anatomy of the vegetative and reproductive organs of the plant with emphasis on development of tissue types. Technique of staining and mounting of plant tissues. Prerequisite: Six hours of plant sciences including Biology 101 or the equivalent. (Offered in 1954-55 and in alternate years thereafter.)

FOR GRADUATES

615. Cytology. (2-6). Credit 4. I

An intensive study of the organization and activities of the cell, with emphasis on topics related to cytogenetics and cytotaxonomy. Prerequisites: Genetics 301; approval of the instructor.

619. Advanced Systematic Botany. (2-6). Credit 4. II

Principles of taxonomy. Phylogenetic considerations and criteria used in schemes of classification. History of classification. Nomenclature and identification. Field and herbarium techniques. Prerequisite: Biology 102 or 327 or 346.

620. Advanced Systematic Botany. (2-6). Credit 4. I

Survey of Angiosperms with emphasis on relationships. Biosystematics and modern taxonomy. Procedures in monograph preparation. Monographers. Field and herbarium techniques with problems designed for individual needs and interests. Prerequisite: Biology 619.

623. Plant Morphology. (2-6). Credit 4. II

A study of the anatomical, reproductive, and organogenetic features of representative vascular plants; emphasis on economic forms. Prerequisite: Biology 327 or the equivalent.

624. Plant Morphology. (2-6). Credit 4. II

A study of the form, structure, reproductive cycles, evolutionary aspects, and biological interrelations of the non-vascular plants, with emphasis on the algae and fungi. Prerequisites: Biology 327, approval of the instructor. (Offered in 1954-55 and in alternate years thereafter.)

634. Foundations of Plant Geography. (3-0). Credit 3. I

Origin, development, distribution, and history of the vegetation areas of the world. Emphasis on North America. Prerequisite: Geology 210, Range and Forestry 301, or approval of instructor. (Offered in 1954-55 and in alternate years thereafter)

651. Mycology. (2-6). Credit 4. II

Detailed studies of the fungi, with emphasis on life cycles of representative forms; genetics and cytology; principles of taxonomy; ecology and geographical distribution. Actinomycetes and lichens are also considered. Prerequisite: Biology 353, or approval of the instructor. (Offered in 1955-56 and in alternate years thereafter.)

ZOOLOGY

107. Vertebrate Zoology. (2-3). Credit 3. I, II

Structure, physiology, and development of animals; emphasis on the biology of vertebrates.

108. Invertebrate Zoology. (2-3). Credit 3. I, II

Classification, comparison, anatomy, and physiology of invertebrate animals. Specimens from the more important invertebrate phyla are studied in the laboratory. Prerequisite: Biology 107 or approval of instructor.

217. Comparative Anatomy of Vertebrates. (2-4). Credit 3. I, II

Comparative anatomy of the Prochordates and the lower vertebrates through Reptilia. Laboratory animals, Molgula, Dolichoglossus, Amphioxus, Squalus, Necturus, and Phrynosoma. Prerequisites: Biology 107, 108.

218. Comparative Anatomy of Vertebrates. (2-4). Credit 3. II

Comparative anatomy of birds and the mammals. Laboratory animals, the chicken and the cat. Prerequisite: Biology 217.

219. Anatomy and Physiology. (2-3). Credit 3. I

Principles of normal anatomy and physiology as applied to man and other vertebrates. Prerequisites: Biology 101, 107.

220. Physiology and Hygiene. (2-3). Credit 3. II

A continuation of Biology 219. Abnormal physiology, disease, causal organisms, prevention and hygiene.

325. Physical Anthropology. (3-0). Credit 3. II

The physiological and biological background which contributed to the development of man. Man's relation to and position in the animal kingdom. The physical characteristics of mankind. Some emphasis will be placed on the fossil relatives and the prehistoric artifacts left by primitive peoples. Prerequisite: Three hours of biological science.

335. Gross and Microscopic Vertebrate Anatomy. (2-3). Credit 3. I

Study of selected features of the anatomy and histology of a mammal with numerous comparisons with homologous structures found in birds. Dissection of specimens and microscopic study of prepared slides will be done in the laboratory. Prerequisites: Biology 107 and 108, or the equivalent.

343. Histology. (1-6). Credit 3. I †

Normal tissues of vertebrates including histogenesis of some. Histogenesis and organography of mammalian tissues reviewed. Prerequisite: Biology 217.

344. Embryology. (2-3). Credit 3. II †

Introduction to general and comparative vertebrate embryology; emphasis on early development of frog, chick, and pig. Prerequisite: Biology 217 or 335.

345. Aquatic Biology. (2-3). Credit 3. II †

Principles of aquatic biology; habitat studies, field collection, preservation, and identification of aquatic organisms. Prerequisites: Biology 101, 107; Entomology 201.

422. Microtechnique. (1-6). Credit 3. II †

Standard methods in the preparation of permanent microscopic slides of plant and animal tissues. Prerequisite: Twelve hours of biological science.

433. General Physiology. (3-3). Credit 4. I

Fundamental physiology of protoplasm; basic process, and function of organs and systems. Emphasis is placed on digestion, respiration, metabolism, excretion, muscular contraction, and reproduction. Prerequisites: Biology 107 and either graduate classification, Biology 218, or the equivalent.

434. General Mammalian Physiology. (2-3). Credit 3. II

General comparative functions of the circulatory and nervous systems, organs of special sense and internal secretion. In the laboratory emphasis will be placed on work with the rat. Prerequisites: Biology 107 and either graduate classification, Biology 218, or the equivalent.

435. Advanced Invertebrate Zoology. (3-3). Credit 4. I †

Morphology, taxonomy, biology, and phylogeny of invertebrate animals, Prerequisite: Biology 107 or 108.

436. Animal Parasitology. (3-3). Credit 4. II †

Study of parasitic worms and protozoa; laboratory methods in parasitology. Prerequisite: Biology 435 or equivalent.

FOR GRADUATES

603. Advanced Vertebrate Zoology. (1-5). Credit 3. II

Phylogeny of vertebrates based on comparative anatomy, histology, embryology, and distribution. Prerequisites: Biology 343, 344, or the equivalent.

604. Advanced Embryology. (1-5). Credit 3. I

Comparative and experimental studies of the mechanics of embryonic development. Prerequisites: Biology 218, 343, 344, or the equivalent.

616. Cytology. (2-6). Credit 4. II

A detailed study of the physicochemical, physiological, and morphological aspects of the animal cell; emphasis on histochemical methods. Prerequisite: Biology 615. (Offered in 1955-56 and in alternate years thereafter.)

627. Helminthology. (3-3). Credit 4. I

A study of the parasitic worms, especially Trematoda, Cestoda, Nematoda, and Acanthocephala. Prerequisite: Biology 436. (Offered in 1954-55 and in alternate years thereafter.)

630. Protozoology. (3-3). Credit 4. II

Morphology, taxonomy, physiology, reproduction, phylogeny, ecology, and life history of both free living and parasitic protozoa. May be taken concurrently with parasitology. Prerequisite: Biology 108. (Offered in 1955-56 and in alternate years thereafter.)

632. Methods in General Physiology. (1-6). Credit 3. II

Methods for the quantitative study of metabolism, respiration, circulation, excretion, movement, and other basic physiological phenomena. Recent advances in physiological methods to be presented on a seminar basis. Prerequisite: Biology 433 or the equivalent.

649. Biology of the Endocrine Glands. (3-3). Credit 4. I

A study of the structure, development, comparative anatomy, and physiology of the endocrine glands of the different animal groups. Prerequisites: Three hours of either anatomy or anatomy and physiology.

Department of Business Administration

Professor T. W. Leland,*

Professors L. E. Davids, N. D. Durst, W. F. Farrar, P. B. Goode, T. R. Hamilton, R. M. Stevenson; Associate Professors R. L. Elkins, D. R. Fitch, S. C. Hoyle, Jr., S. T. Keim, T. D. Letbetter, W. S. Manning, T. R. Yantis; Assistant Professors V. F. Ridgway, N. A. Stewart, Jr., H. G. Thompson, Jr., R. P. Wood; Instructors W. C. Davis, W. B. Flowers, D. J. Lenehan, J. B. Longley, J. D. O'Neill, L. W. Sherman, Jr.

105. Introduction to Business. (3-0). Credit 3. I, II

Provides an over-all picture of business operations, develops a business vocabulary, and directs the thinking of each student to the field of business best suited to his interest and talent. Subject matter includes an analysis of the specialized fields within the business organization and of the role of business in modern society.

205. Marketing. (3-0). Credit 3. I, II, S

A study of institutions, processes, and problems involved in transferring goods from producers to consumers, with emphasis on economic and social aspects.

206. Purchasing and Control of Materials. (2-0). Credit 2. I, II, S

Operation of a purchasing department in a manufacturing business; organization of the department; specifications, standards, contract provisions; sources of supply; methods of perpetual inventory.

208. Advertising. (3-0). Credit 3. I, II

Place of advertising in business; advertising media, such as the newspaper, tradepaper, magazine, direct mail, poster, and the radio; description of the various methods of advertising; development of copy and layout of advertisements; consumer habits and psychology; methods of investigations for advertising campaigns; cost of advertising; legal and ethical problems involved in advertising; consideration of advertising from the standpoint of consumers. Prerequisites: Business Administration 205; Economics 203 or 403.

209. Principles of Accounting. (2-3). Credit 3. I

An introductory course designed primarily for students who do not plan to major in one of the several fields of business administration but who desire a background in accounting which will be of value in their respective fields. The course is not as comprehensive as Business Administration 227 but covers a survey of the same topics.

210. Principles of Accounting. (2-3). Credit 3. II

A continuation of Business Administration 209. The course is not as comprehensive as Business Administration 228 but covers a survey of the same topics. Prerequisite: Business Administration 209.

216. Building Products. (0-2). Credit 1. II

A study of building products, their physical properties, and their markets. Prerequisite: Business Administration 205.

227. Principles of Accounting. (3-3). Credit 4. I, II, S

An introductory course designed to serve as a foundation for study of advanced accounting and to furnish a knowledge of accounting which will be of value to students in other fields. The subject matter includes: analysis and recording of business transactions; use of journal and ledger; trial balance and work sheet; adjusting and closing entries; accounting statements; special journals and ledgers; business papers and business procedures related to accounting.

228. Principles of Accounting. (3-3). Credit 4. I, II, S

A continuation of Business Administration 227. Voucher system; payroll records and payroll taxes; internal check; introduction to partnership and corporation accounting; accounting for manufacturing concerns; analysis and interpretation of statements. Prerequisite: Business Administration 227.

303. Statistical Method. (3-3). Credit 4. I, II, S †

Collection, tabulation, presentation, and analysis of data. A study of sampling, graphics, averages, ratios and coefficients, dispersion, skewness, probability and error, index numbers, seasonal and long-time trend, barometers, correlation. Prerequisite: Mathematics 101.

304. Business Cycles and Business Measurements. (3-0). Credit 3. I, II, S †

An empirical and statistical study of economic fluctuations; theory, causes, and control of business cycles; business barometers and forecasting. Study of economic and statistical services. Prerequisite: Business Administration 303.

305. Business Law. (3-0). Credit 3. I, II, S †

Nature and scope of law; court system; homestead and exemption laws of Texas; law of contracts; principal and agent; business organizations, including partnerships and corporations; the Texas community property laws. Prerequisite: Sophomore classification.

306. Business Law. (3-0). Credit 3. I, II, S †

Additional studies in the law of business, dealing with bailments, carriers, mortgages, suretyships, negotiable instruments, banks and banking, wills and estates, sales, bankruptcy. Prerequisite: Business Administration 305.

308. Law of Private Corporations. (3-0). Credit 3. I, II †

Powers and limitations of the corporate form of business organization as distinguished from other forms of business enterprise. Legal problems encountered in formation, management, financing, and dissolution of corporations. Rights of corporate stockholders and creditors. Legislative control under state and federal statutes. Prerequisite: Business Administration 306.

309. Food and Drug Law. (3-0). Credit 3. II

The law regulating the manufacture, sale, and use of articles of food and drink and substitutes therefor; property rights and traffic in unwholesome or adulterated articles and civil law liabilities of food handlers and processors for illness and injury to consumers. Prerequisite: Junior classification. (Offered in 1954-55 and in alternate years thereafter.)

310. Credits and Collections. (2-0). Credit 2. II

The elements of mercantile and consumer credit; organization of a credit department; sources of credit information; collection tools and procedures.

312. Statistical Charts and Graphs. (1-3). Credit 2. II

Graphic presentation of statistical data, construction of charts, calculating charts and nomographs, statistical maps, rate of change analysis, visual aids in presenting business reports. Prerequisite: Business Administration 303. (Offered in 1954-55 and in alternate years thereafter.)

315. Insurance. (3-0). Credit 3. I, II, S

A general analysis of life, fire, automobile, casualty, suretyship, and liability insurance including a critical examination of selected policy forms. Both the buyer's and the seller's interests will be presented.

316. Office Management. (2-0). Credit 2. I, II, S

The problem of office management; the function of the office manager; office systems, handling of correspondence, filing, mailing; office furniture and equipment; office forms and supplies and their control; the office building and the office layout; selection, training, and compensation of office personnel; office manuals and reports; budgetary control in the office.

317. Punch Card Methods. (1-2). Credit 2. I, II, S

Instruction and practice in the operation of punch card machines for the handling of accounting and statistical data. Prerequisites: Business Administration 228, 303.

318. Wholesale Merchandising. (3-0). Credit 3. I, II

A presentation of the basic principles and economic functions of the wholesaler. Also a study of the modern wholesaling systems and the operation and management of a wholesale business. Prerequisites: Business Administration 205; junior classification.

320. Life Insurance. (3-0). Credit 3. II †

Fundamentals of life insurance and annuities; types of life insurance policies and their utilization in private life and business. Rate determinants, reserves, dividends, policy terms, and selection of risks. Distinguishing characteristics of group and industrial insurance. Basic principles and common uses of annuities. The course is designed to provide a knowledge of the fundamentals of life insurance and annuities as a useful background for laymen, businessmen, and life insurance salesmen. Prerequisite: Business Administration 315.

322. Property Insurance. (3-0). Credit 3. I †

The nature of property insurance and the principles of its employment. Fire insurance, marine insurance, and miscellaneous types of insurance. Emphasis is placed on underwriters, contracts, coverage, special endorsements, and rate determinants for each of the broad fields indicated above. The course is designed for students who are considering employment in the insurance field and for potential property managers. Prerequisite: Business Administration 315.

324. Casualty Insurance and Suretyship. (3-0). Credit 3 II. †

Principles and practices of casualty insurance and suretyship. Course covers the following forms of insurance: (1) automobile insurance; (2) aviation insurance; (3) workmen's compensation insurance; (4) general liability lines; (5) power plant and machinery breakdown insurance; (6) theft insurance; (7) accident insurance; (8) fidelity bonds; (9) corporate suretyship. Prerequisite: Business Administration 315.

325. Retailing. (3-0). Credit 3. I, II, S

Fundamental operations of retailing concerns and the need for effective coordination of retailing activities. Prerequisites: Business Administration 205; Economics 203 and 204, or 403.

327. Intermediate Accounting. (3-3). Credit 4. I, S

Working papers and preparation of statements; correction of books and statements; statement analysis; special phases of corporation accounting. Prerequisite: Business Administration 228.

328. Intermediate Accounting. (3-3). Credit 4. II, S

Cash and receivables; inventories; tangible and intangible fixed assets; investments; liabilities, reserves; statement of application of funds. Prerequisite: Business Administration 327.

329. Cost Accounting. (3-0). Credit 3. I, S

Development of cost accounting principles relating to material, labor, and manufacturing expense; inventory controls, payroll and wage systems; job order cost systems; process costs; joint and by-product costs. Prerequisite: Business Administration 228.

330. Advanced Accounting. (3-0). Credit 3. II, S †

Special phases of partnership accounting; joint ventures; consignments; installment sales, accounting for insurance costs; statement of affairs and accounting for insolvent concerns; compound interest; home office and branch accounting. Prerequisite: Business Administration 328 or registration therein.

333. Business Machines. (0-2). Credit 1. I, II

A study of major types of machines used for assembling and recording accounting and statistical information. Prerequisite: Business Administration 228.

344. Marketing Problems. (3-0). Credit 3. II †

A study of the problems involved in the marketing of industrial and consumer goods; the problems connected with customer relations, channels of distribution, brands, sales promotion, pricing, and legislation. Prerequisites: Business Administration 205, 208, 325.

352. Personal Finance. (2-0). Credit 2. I, II

Personal and family accounts; budgets, budgetary control; bank accounts; charge accounts; borrowing; investing; insurance; standards of living; renting; home ownership; wills, trust plans. Prerequisite: Economics 203 or the equivalent.

361. Survey of Intermediate Accounting. (3-0). Credit 3. I, S

Intermediate accounting for students who are not accounting majors but desire additional accounting training beyond the elementary level. Subject matter includes statement analysis; special phases of corporation accounting; cash and receivables; inventories; tangible and intangible fixed assets; liabilities; reserves. The course is not as comprehensive as Business Administration 327, 328 and is not open to students majoring in accounting. Prerequisite: Business Administration 228.

402. Accounting Systems. (3-0). Credit 3. II †

Survey of accounting systems in current use by different types of businesses. System design and installation. Manual and machine procedures. Prerequisite: Business Administration 328.

403. Income Tax. (3-0). Credit 3. I, II †

Income tax legislation; the present income tax law and regulations; treasury decisions, court decisions, and departmental rulings; income tax problems and returns. Prerequisite: Business Administration 327.

404. Managerial Accounting. (3-0). Credit 3. II

A study of the uses of accounting information by management. Emphasis is placed on accounting procedures and reports essential to management. Cost analysis, cost control, budgeting and controllership. Prerequisite: Business Administration 329.

407. Auditing. (3-0). Credit 3. I †

Auditing procedures used by internal auditors and independent public accountants; preparation of working papers. Prerequisites: Business Administration 328, 329.

408. Auditing. (3-0). Credit 3. II †

A continuation of Business Administration 407. Work on an audit practice case with preparation of working papers and audit report, case studies involving auditing problems in special situations. (Required of students who plan to enter public accounting.) Prerequisite: Business Administration 407.

409. Survey of Accounting Principles. (3-0). Credit 3. I, II, S †

Principles of accounting for students majoring in engineering, architecture, agriculture, and veterinary medicine. Emphasis is placed on the viewpoint of the special groups, and in so far as enrollment permits, separate sections will be used to meet their respective needs. The course is not as comprehensive as Business Administration 227, 228, is not open to students in business administration, agricultural administration, or liberal arts. Prerequisite: Junior classification.

418. Corporation Finance. (3-0). Credit 3. I, II, S †

Common forms of business organization with special attention to the corporation; advantages and disadvantages of incorporation; capital stock and bonds; working capital; surplus and dividend policy; corporate expansion and industrial combination; failure and reorganization. Prerequisite: Economics 403 or the equivalent.

420. Principles of Investment. (3-0). Credit 3. I, II, S

The development of investment policy; the character of investment risk; a comparison of investment media; a description of security markets and their operations. Prerequisites: Business Administration 418; Economics 403 or the equivalent.

422. Personnel Problems of Industry. (3-0). Credit 3. I, II, S †

The relation of the worker to his employer, the methods of job finding, interviewing aids, occupational trends, scientific management, the functions and structure of personnel departments, employee welfare activities, and other problems of contemporary industrial development. Prerequisite: Junior classification.

423. Personnel Policies and Techniques. (3-0). Credit 3. I, S †

Programs and agencies which workers and employers have developed to improve their economic and social status; job analysis, description, and classification; wage and salary problems and procedures; personnel records. Prerequisite: Business Administration 422.

427. Insurance Law. (3-0). Credit 3. II †

Law cases on insurance to develop an understanding of the methods of administrative control by the state; typical clauses of insurance policies and their interpretation by the courts; technical legal pitfalls; case examples from all forms of insurance coverage; Texas insurance law. Prerequisite: Business Administration 305.

428. Real Estate Titles and Conveyances. (3-0). Credit 3. I, II, S †

The ownership and transfer of titles to real property, including deeds, easements, urban and rural property with special attention to zoning, building codes, private restrictions and conditions. The law of fixtures, timber and crops, mortgages and liens, building contracts, plans and specifications, performance bonds, mines and minerals, contracts of sale, escrow and earnest money agreements, real estate brokers, sufficiency of property description and other matters related to real property. Prerequisite: Business Administration 305.

429. Advanced Statistical Method. (2-3). Credit 3. I

Continuation of Business Administration 303 with more detailed study of multiple correlation, sampling, analysis of variance, chi-square test and curve fitting. Prerequisite: Business Administration 303. (Offered in 1954-55 and in alternate years thereafter.)

430. Cost Accounting Survey. (3-0). Credit 3. I, II, S †

An introductory cost accounting course following Business Administration 409, for architects, engineers, and agricultural students. Purposes and uses of cost accounting; elements of cost; unit costs for use in bidding on contracts; comparison of cost procedures; job order and process costs, budgets, and standard costs; cost reports. Prerequisite: Business Administration 409.

432. Security Analysis. (3-0). Credit 3. II

Methods of analyzing individual security issues, establishment of principles of selection and protection of security holdings, setting up sound and workable tests of safe investments including financial statement analysis, understanding rights and interests of investors in senior securities and owners of common stock. Prerequisite: Business Administration 420.

433. Business Management. (3-0). Credit 3. I, II, S

Policies and methods used in managing industrial and business enterprises. Emphasizes the problems of developing and operating an individual business, and of applying effective management principles to firms of varying size and nature. Prerequisite: Junior classification.

434. Problems in Finance. (3-0). Credit 3. II †

The course presents a series of comprehensive financial problems confronting the management of large and small businesses. The analysis and solution of the problems utilize the techniques and methods acquired in previous courses. The case system is used to give the student practice in linking up the related legal, accounting, and financial aspects of each situation. Prerequisite: Business Administration 418.

435. Salesmanship. (3-0). Credit 3. I, II, S

A consideration of the general principles of successful personal selling. Particular attention is given to personal requisites, qualifications, and training programs to enable the student to become a successful salesman. Prerequisites: Economics 203 and 204, or 403.

436. Sales Management. (3-0). Credit 3. II, S †

A consideration of the problems confronting the modern sales executive; organization of sales departments, product research, selection and recruiting, compensation plans, routing, supervision, and costs connected with sales administration. Prerequisite: Business Administration 435.

437. Applied Life Insurance. (3-0). Credit 3. I †

This course applies the principles of life insurance to the business field with particular emphasis on sole proprietorships, partnerships, key-man problems and close corporation stock purchase. It shows how life insurance can be used in preventing estate shrinkage. Business insurance, tax problems, and wills pertaining to life insurance are covered. Stocks, bonds, and real estate are measured against life insurance as good property.

438. Commercial Bank Management. (3-0). Credit 3. S

Managerial problems and policy decisions that confront officers of financial institutions, organization, capital structure, liquidity, solvency, primary reserves, secondary reserves, investment portfolio, loan policy, service charges, duties of the board. Course is oriented not only for the banker but also for the business man in his relationship to his bank and savings and loan associations. Prerequisite: Economics 311.

440. Real Estate Fundamentals. (3-0). Credit 3. I

Basic factors and agencies which comprise the structure of our modern real estate development. A study of the historic, economic, legal, and financial aspects of realty and the effect of their interplay on the institution of real property, both urban and rural. Designed for the home and business property owner as well as for the professional real estate man.

442. Real Estate Practice. (3-0). Credit 3. II

A study of the practical techniques and procedures employed in real estate transactions, with emphasis on real estate appraisal, sales, finance, and industrial property management. Prerequisite: Business Administration 440 or approval of the instructor.

446. Marketing Industrial Products. (2-0). Credit 2. II

Management aspects and economic factors affecting marketing policies are considered. Special emphasis is given to marketing research, marketing policies, channels of distribution, brand policy, pricing and control of marketing operations as they affect industrial products. A term project involving a report on the marketing of a specific industrial product is required of each student. Prerequisites: Business Administration 205, 303.

447. Advertising Procedures. (3-0). Credit 3. I

Study of advertising procedures for newspapers, magazines, radio, and television. Specific topics include retail, mail order, national and industrial advertising; advertising agencies; advertising research; and advertising campaigns. Prerequisite: Business Administration 208.

452. Veterinary Jurisprudence. (3-0). Credit 3. II

A study of Texas statutes and court decisions regulating and affecting the practice of veterinary medicine. One of the primary functions of this course is to prepare the student for the State Board examination in veterinary law. Prerequisite: Senior classification in the School of Veterinary Medicine.

456. Applied Salesmanship. (0-2). Credit 1. II

A practical course in personal salesmanship. Analysis of specific products; planning and execution of the interview; psychological aspects of selling. Particular stress is made on sales demonstration and the strategy involved in closing the sale. Prerequisites: Business Administration 435; English 403.

461. Retailing Building Products. (2-0). Credit 2. I

A study of the special problems of the dealers in building products. Prerequisite: Business Administration 325.

463. Employee Supervision. (2-0). Credit 2. II

A study of the relationships of the first level of management to supervisors and to the staff. The objectives, organization, and tools of the supervisory level; how to handle problems of grievances, absenteeism, discipline, morale, induction, safety, and training of workers. Prerequisite: Senior classification.

FOR GRADUATES

601. Statement Analysis. (3-0). Credit 3. II, S

An analytical study of the different kinds of statements for the guidance of executives, investors, and creditors; balance sheet and profit and loss ratios. Prerequisite: Business Administration 328.

602. Consolidated Statements. (2-0). Credit 2. II

Consolidated balance sheets, consolidated income and surplus statements, holding companies, mergers. Prerequisite: Business Administration 330. (Offered in 1954-55 and in alternate years thereafter.)

603. Price Analysis. (3-2). Credit 4. I, S

Economic concepts relating to prices, statistical methods of analyzing prices, supply and demand curves, elasticity of demand, price forecasting, study and criticism of works on price analysis. Term paper required on factors affecting the price of a commodity. Prerequisites: Business Administration 303; Economics 203, 204.

604. Statistics. (3-2). Credit 4. II, S

Curve fitting and empirical formulas. Multiple correlation, mathematical and graphic. Sampling and measures of unreliability. Chi-square test. Analysis of variance and covariance. Prerequisites: Business Administration 303; Mathematics 101. Mathematics 110 is recommended.

605. Accounting Problems. (3-0). Credit 3. I

A study of advanced accounting theory and problems dealing primarily with corporation accounting, assets and liabilities, analysis of statements, and cost accounting. The problems considered will be of the type currently stressed in accounting examinations. Prerequisite: Approval of instructor.

606. Accounting Problems. (3-0). Credit 3. II

A continuation of Business Administration 605. The topics will deal primarily with partnerships, fiduciaries, home office and branch, insurance, and auditing. Prerequisite: Approval of instructor.

607. Market Analysis. (3-0). Credit 3. I

A study of the methods of conducting consumer investigations; the forms used; planning the sample, gathering data, testing the sample; tabulating, analysis, and interpretation of the result. Prerequisites: Business Administration 205, 303.

608. Distribution Cost Analysis. (3-0). Credit 3. I

A study of the marketing costs of manufacturers, wholesalers, and retailers with emphasis on the possible elimination of wastes in the distribution of both industrial and consumer goods. Prerequisites: Business Administration 303, 329. (Offered in 1954-55 and in alternate years thereafter.)

612. Advanced Taxes. (2-0). Credit 2. II

A study of special income tax problems of taxpayers; Federal estate and gift taxes; Texas inheritance tax; Texas franchise tax on corporations; claims for refund of taxes; preparation of protests to deficiency assessments; planning for tax savings. Prerequisite: Business Administration 403. (Offered in 1955-56 and in alternate years thereafter.)

616. Governmental and Institutional Accounting. (3-0). Credit 3. I, S

A study of the accounting principles and procedures peculiar to governmental units and institutions. Prerequisite: Business Administration 328. Economics 412 is recommended.

619. Legal Principles Relating to Accounting. (3-0). Credit 3. I, S

An intensive study of legal principles emphasizing those which arise in the practice of accounting.

620. Law and Business. (3-0). Credit 3. I

Students write a paper on a topic of law in which they are interested, approved by instructor. Also, the following topics are covered: law and business, their relation to each other; present sources of law in Texas today; community property laws of Texas; collection of judgments in Texas; ad valorem taxes; automobile accidents and other topics relating to business.

621. Law of Municipal Corporations. (3-0). Credit 3. II

A presentation of the general principles of the law of municipal corporations (city governments) in their relation to private business and the public at large, dealing with aspects of police powers, taxation, indebtedness, administration, public welfare, and legislative control. Prerequisite: Business Administration 305. (Offered in 1955-56 and in alternate years thereafter.)

622. Trade Regulations. (3-0). Credit 3. II, S

Delineation of governmental control intended to promote free competition and curb its abuses. A study of the federal anti-trust acts and their application by the courts; the Federal Trade Commission and its method of dealing with unauthorized business practices such as unfair competition, misleading advertising, price discrimination, and retail price maintenance. Prerequisite: Business Administration 305.

630. Problems of Corporation Finance. (3-0). Credit 3. I

The financial problems of the profit seeking corporation are discussed from the viewpoint of the corporate financial officer. Consideration is given to such matters as current financing, financial aspects of promotion, refunding operations, dividend policies, and corporate reorganization. The course is designed to exercise the principles of corporation finance. Prerequisite: Business Administration 418. (Offered in 1954-55 and in alternate years thereafter.)

631. Business Investigation and Analysis. (3-0). Credit 3. II

The problems arising in the quantitative and qualitative analysis of railroad, public utility, and industrial securities are presented so as to train the advanced student of investments in the use of the tools of security analysis. The text material is supplemented by the consistent use of representative sources of investment information. Prerequisite: Business Administration 418. (Offered in 1955-56 and in alternate years thereafter.)

634. Statistical Method Applied to Business Problems. (3-0). Credit 3. II

The use of statistical methods applied to sales control, cost studies, personnel management, forecasting sales and production of an individual concern, and forecasting general business activity. Readings, reports, and problems. Prerequisite: Business Administration 303, 604. (Offered in 1954-55 and in alternate years thereafter.)

681. Seminar. (1-0). Credit 1 each semester. I, II
A critical examination of the subject matter presented in current periodicals, recent monographs and bulletins. Separate seminars will be conducted as required in fields such as accounting, finance, marketing, personnel administration, and statistics.

691. Research. Credit 2 to 4 each semester. I, II, S
Research for thesis.

Department of Chemical Engineering

Professor J. D. Lindsay,
Professors F. F. Bishop*, W. D. Harris; Associate Professor R. V. Andrews; Assistant Professor C. D. Holland

204. Elementary Chemical Engineering. (3-0). Credit 3. I, II
An introduction to the fundamentals of chemical engineering which involves the solution of elementary problems on the application of mass balances, energy balances, equilibrium balances, rate of approach to equilibrium, and economic balances. Prerequisites: Chemistry 205; Mathematics 210 or registration therein.

304. Unit Operations. (3-0). Credit 3. I, II †
A study of fluid and heat flow, evaporation and drying. Prerequisite: Chemical Engineering 204.

314. Unit Operations Laboratory. (0-3). Credit 1. II †
Laboratory work based on Chemical Engineering 304. Prerequisite: Chemical Engineering 304.

409. Oil and Gas Technology. (3-0). Credit 3. I †
Application and principles of chemistry and chemical engineering in evaluation methods. Study of physical and chemical treatment of petroleum and its products. Emphasis on thermodynamic relations. Prerequisite: Chemical Engineering 423.

423. Unit Operations. (3-0). Credit 3. II, S †
A continuation of Chemical Engineering 304 covering distillation, gas absorption, filtration, size reduction, separation, and mixing. Prerequisite: Chemical Engineering 304.

426. Plant Design. (2-6). Credit 4. II †
The solution of problems involved in the design and development of chemical engineering plants. These problems cover such factors as the capacity, selection, and location of equipment, reaction rates, economic balances, specifications, drawings, cost estimates, and plant location. Prerequisite: Chemical Engineering 441.

428. Industrial Chemical Processes. (3-0). Credit 3. II
A study of representative chemical manufacturing processes and their relationships. Prerequisite: Chemical Engineering 441.

429. Oil and Gas Technology Laboratory. (0-3). Credit 1. I †
Laboratory work to accompany Chemical Engineering 409.

433. Unit Operations Laboratory. (0-3). Credit 1. I †
Laboratory work based on Chemical Engineering 423. Prerequisite: Chemical Engineering 314.

438. Seminar. (1-0). Credit 1. I
Oral discussion of selected topics from recent technical publications. Prerequisite: Senior classification.

441. Chemical Engineering Unit Processes. (3-0). Credit 3. I
A study of such unit processes as sulfonation, nitration, hydrogenation, and alkylation, and the equipment required for them. Prerequisite: Chemical Engineering 423.

*Deceased March 6, 1954.

445. Advanced Problems in Chemical Engineering. Credit 1 to 5. I, II

Special problems in chemical engineering are assigned to individual students or groups. The work may cover the numerous particular problems in chemical engineering processes or operations. It may be laboratory work or conference and discussion. Prerequisites: Chemical Engineering 423; approval of the Head of the Department.

447. Nuclear Engineering. (3-0). Credit 3. I †

A study of the applications of engineering fundamentals to nuclear processes. The course will discuss nuclear reactions and how they may be applied to obtain power. Engineering problems involved in the construction and operation of nuclear reactors will be covered. Atomic fuels and their radioactive residues, as well as attendant health hazards, will be included. Prerequisites: Mathematics 210; Physics 204; senior classification.

454. Chemical Engineering Thermodynamics. (3-0). Credit 3. I †

A study of the applications of thermodynamics to chemical engineering processes and operations. Prerequisites: Chemical Engineering 423; Chemistry 324.

461. Process Control and Instrumentation. (2-0). Credit 2. I †

A study of the fundamental principles and methods used in the measurement and control of the process variables such as pressure, temperature, and flow rate. Prerequisite: Chemical Engineering 423.

464. Chemical Engineering Kinetics. (3-0). Credit 3. II

An introduction to the kinetics of reactions and the application of fundamental principles to the design and operation of commercial reactors. Prerequisites: Chemical Engineering 441, 454.

FOR GRADUATES

605. Chemical Engineering Economics. (3-0). Credit 3. I

Advanced calculations involving process design and process control as limited by least cost or maximum profit. Problems are based on the various unit operations and unit processes. Prerequisite: Chemical Engineering 423.

606. Unit Operations in Petroleum Refining. (4-0). Credit 4. II

Applications of chemical engineering fundamentals in the refining of petroleum. Prerequisite: Chemical Engineering 423.

607. Thermal Cracking. (3-0). Credit 3. I

Application of fundamentals of chemical engineering to process calculation on thermal cracking. This includes process control and process design. Prerequisites: Chemical Engineering 423, 606.

608. Heat Transmission. (3-0). Credit 3. I

Process and process design calculations on equipment involving the transfer of heat by conduction, convection, and radiation. Prerequisite: Chemical Engineering 423.

611. Furnace Design. (3-0). Credit 3. II

Process designs of furnaces. Involves radiant and convection heat transmission. Prerequisite: Chemical Engineering 608.

612. Distillation. (3-0). Credit 3. I

Process and process design calculations involving distillation of multicomponent and complex systems. Extractive and azeotropic distillation are covered. Prerequisite: Chemical Engineering 423.

616. Estimation of Investment Cost. (2-0). Credit 2. II

Simplified methods of estimating cost of process equipment in the preparation of preliminary appraisals. Prerequisite: Chemical Engineering 423.

617. Unit Processes in Petroleum Refining. (4-0). Credit 4. I

Calculations involving the effect of process variables on product yield and quality, rate of reaction, operating cost, and investment cost. Processes such as alkylation, isomerization, catalytic cracking, polymerization, thermal cracking, etc. will be covered. Prerequisites: Chemical Engineering 454, 616.

618. Appraisal and Presentation of Chemical Engineering Data. (3-0). Credit 3. II

Emphasis will be placed on analysis of experimental data. Practice is obtained by writing reports based on specific problems. Prerequisite: Chemical Engineering 423.

619. Corrosion and Materials of Construction. (3-0). Credit 3. I

The uses of materials of construction to preclude high corrosion rates in process equipment. Prerequisite: Chemical Engineering 423.

623. Applications of Thermodynamics to Chemical Engineering. (3-0). Credit 3. II

A study of the applications of thermodynamics to chemical engineering operations and processes.

624. Chemical Engineering Kinetics I. (3-0). Credit 3. I

A study of rates and mechanisms of chemical reactions. Thermal and catalytic reactions both homogeneous and heterogeneous are considered. Prerequisite: Chemical Engineering 423.

625. Chemical Engineering Kinetics II. (3-0). Credit 3. II

A study of the physical factors affecting chemical reaction rates and of methods for design of reaction equipment. Prerequisite: Chemical Engineering 624.

626. Oil and Fat Technology. (3-0). Credit 3. I

A study of the composition and properties of oils and fats, methods of extraction and purification, and their industrial utilization. Prerequisites: Chemical Engineering 423; Chemistry 802.

627. Oil Mill Operation. (2-6). Credit 4. I

A study of the theoretical and practical operating characteristics of the various units used in vegetable oil production. The economic factors of each unit and their over-all effect on plant operation will be covered. Prerequisites: Chemical Engineering 423, 626 or registration therein.

681. Seminar. (1-0). No credit. I, II

Graduate students will be required to attend one hour per week to discuss problems of current importance in connection with their research.

685. Problems. Credit 1 to 6. I, II, S

Special work to suit individual or small group requirements. The work may cover the numerous particular problems in chemical engineering processes and operations. It may be laboratory work or conference and discussion. Prerequisite: Approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II, S

Problems of unit operations and unit processes. For maximum credit comprehensive thesis must be prepared which is of sufficiently high calibre to permit a publication in the scientific and technical journals. Prerequisite: Approval of Head of Department.

Department of Chemistry

Professor F. W. Jensen,

Professors C. K. Hancock, C. C. Hedges, E. B. Middleton, W. M. Potts, G. M. Watson*; Associate Professors E. L. Harter, S. R. McInnis, J. O. Page, R. E. Snuggs; Assistant Professors T. S. Burkhalter, A. F. Isbell, D. R. Lee, Henry Rakoff, A. F. Schram, R. D. Thompson, H. K. Zimmerman, Jr.; Instructors R. B. Alexander, J. B. Beckham, C. H. Dickson, Dan Peacock

100. Fundamentals of Chemistry. (3-0). Credit 3. S

This is a general non-laboratory treatment of the fundamentals of chemistry. It is designed to meet the needs of students who have not had chemistry in high school but who wish to register in it before enrolling in required chemistry courses. No credit toward a degree will be granted for the satisfactory completion of this course.

*On leave of absence.

101. General Chemistry. (3-3). Credit 4. I, II, S

Fundamental laws and theories of chemical activity. Practical application of the more important chemical processes involving non-metals are briefly described.

General laboratory work deals with non-metals and simple tests of technical importance supplementing lecture demonstrations.

102. General Chemistry. (3-3). Credit 4. I, II, S

Fundamental theories of structure and activity. Practical application of the more important chemical processes involving metals described. Organic chemistry is briefly outlined.

Laboratory work consists of elementary qualitative separation and identification of metallic and non-metallic ions. Prerequisite: Chemistry 101.

106. General Chemistry. (3-3). Credit 4. II

A survey course in chemistry for students needing it as a cultural subject and not as a basis for advanced work.

109. General Chemistry. (3-3). Credit 4. I

Fundamental principles and processes; metals and non-metals. For properly qualified students only. Prerequisites: Examinations administered by Basic Division; previous scholastic record.

205. Qualitative Analysis. (2-6). Credit 4. I, II

The theory and practice of fundamental analytical operations assigned to enable the student to make rapid and accurate analysis of substances of average complexity, and to understand the steps by which his results are obtained.

The laboratory work consists of a study of the properties and reactions of the more common basic and acidic radicals, their separation and identification from mixtures, the method of getting solids into solution for analysis of unknown substances. Prerequisite: Chemistry 102 or 109.

207. Elementary Quantitative Analysis. (2-3). Credit 3. I, II, S

A considerable portion of the classroom time is devoted to chemical calculation involved in the practice.

The laboratory work consists of a number of carefully selected experiments in quantitative analysis designed to typify operations of general application. Prerequisite: Chemistry 102 or 109.

216. Quantitative Analysis. (2-6). Credit 4. I, II, S

An introduction to the methods of exact analysis as preliminary training for the more advanced courses. In the classroom the practice and theory of the laboratory exercises are dealt with by lectures and recitations. Special attention is given to stoichiometry.

The laboratory work consists of a number of carefully selected experiments in quantitative analysis designed to typify operation of general application. The work is first volumetric, then gravimetric. In the early periods samples of known composition and purity are analyzed. Prerequisite: Chemistry 102 or 109.

223. Elementary Quantitative Analysis. (2-3). Credit 3. I, II, S

Stress is placed on the basic principles and theories of quantitative analysis, both gravimetric and volumetric. The treatment is not highly mathematical. The laboratory work is designed to illustrate basic techniques. Not open to engineering students. Prerequisite: Chemistry 102 or 109.

225. Elementary Organic Chemistry. (3-0). Credit 3. I, II

A study of the aliphatic series with their substituents. Special emphasis on the hydrocarbons and their relation to the field of petroleum. Prerequisite: Chemistry 102 or 109.

231. Elementary Organic Chemistry. (3-0). Credit 3. I, II, S

A study of the aliphatic series of organic compounds including an introduction to the benzene series and to vitamins, proteins, and related substances. Applications are taken from the field of agriculture. Not open to engineering students. Prerequisite: Chemistry 102 or 109.

301. Organic Chemistry. (3-3). Credit 4. I, II, S †

An introduction to the chemistry of the compounds of carbon. A study of general principles and their application to various industrial processes.

The laboratory work serves as a basis of the course; the student here familiarizes himself with the reactions, properties, and relations of typical organic compounds. Prerequisite: Chemistry 102 or 109. Chemistry 216 is strongly recommended.

302. Organic Chemistry. (3-3). Credit 4. I, II, S †
A continuation of Chemistry 301. Prerequisite: Chemistry 301.

323. Physical Chemistry. (3-3). Credit 4. I †
Explanation and mathematical development of the theories and principles of chemistry. Topics discussed are atomic structure, gas laws, thermodynamics, thermochemistry, liquids, solutions, osmotic pressure, and colloids. Experiments in the laboratory substantiate the theories and principles developed in the classroom. Prerequisites: Chemistry 216; Mathematics 210.

324. Physical Chemistry. (3-3). Credit 4. II †
Intensive study of homogeneous and heterogeneous equilibria, the phase rule, chemical kinetics, catalysis, hydrogen-ion concentration, electrolytic and galvanic cells and electrochemistry, photochemistry, and radioactivity. Prerequisite: Chemistry 323.

342. Physical Chemistry. (3-3). Credit 4. II †
Explanation of basic chemical theories and principles with reference to their relationship to transformations in living matter. Special emphasis on such topics as atomic structure, diffusion and osmotic pressure, colloids, chemical equilibrium, catalysis, reaction velocity, hydrogen-ion concentration and its importance in biological processes. Prerequisites: Chemistry 207 or 216, and 301.

344. Physical Chemistry. (3-0). Credit 3. I, II, S
Structure of atoms, molecules, and crystals. Valence. Theories of polarity and ionization. Properties of gases, liquids, solids, and fugacities. Solubilities and properties of solutions. Study of colloids and surface energy. Equilibria. Electromotive force and oxidation potentials. Prerequisites: Chemistry 207, and 225 or 301; Mathematics 209; Physics 204.

400. Industrial Analysis. (1-6). Credit 3. I †
Lectures, recitations, and conferences dealing with technical methods of analysis both rapid and exact. Before beginning an analysis the student is required to consult current literature and standard books of reference and present a written outline for criticism and suggestion.
The laboratory work comprises the analysis of limestone, fuels, lubricating oils, gas, boiler water, iron and steel, alloys, ores, paint, soap, sugar, asphalt, and other materials of engineering and industrial importance. Prerequisite: Chemistry 216.

443. Animal Biochemistry. (3-3). Credit 4. I †
The chemistry of cell constituents, digestion, and absorption. Prerequisite: Chemistry 302. (Offered in 1955-56 and in alternate years thereafter.)

444. Animal Biochemistry. (3-3). Credit 4. II †
The chemistry of blood, respiration, and intermediary metabolism. Prerequisite: Chemistry 443. (Offered in 1955-56 and in alternate years thereafter.)

445. Plant Biochemistry. (3-3). Credit 4. I †
The chemistry of plant constituents. Prerequisite: Chemistry 302. (Offered in 1954-55 and in alternate years thereafter.)

446. Plant Biochemistry. (3-3). Credit 4. II †
The chemistry of respiration and metabolism of plants. Prerequisite: Chemistry 445. (Offered in 1954-55 and in alternate years thereafter.)

447. Qualitative Organic Analysis. (1-6). Credit 3. II †
The identification of the principal classes of organic compounds. Prerequisite: Chemistry 302.

448. Electrochemistry. (2-3). Credit 3. II †
A study of the theory of galvanic and electrolytic cells and their applications. Prerequisite: Chemistry 324.

449. Energetics.(4-0). Credit 4. I †
Study and mathematical treatment of energy relationships involved in chemical and physical transformations. Special attention given to free energy, fugacity, and activity. Prerequisites: Chemistry 302, 324.

450. Colloidal Chemistry. (3-3). Credit 4. I †
A study of the theories and preparation of disperse systems. Prerequisites: Chemistry 302, 324.

452. Inorganic Chemistry. (3-3). Credit 4. II †

The periodic relationship of the elements, their application and compounds. Laboratory work consists of advanced inorganic preparations. Prerequisite: Chemistry 324.

454. Seminar. (1-0). Credit 1. I

Oral discussion of selected topics from technical publications.

455. Paints and Coatings. (4-0). Credit 4. I

Study of types, composition, drying properties, and behavior of natural and synthetic oils and resins. Prerequisites: Chemistry 302, 324.

FOR GRADUATES

607. Organic Preparations. (2-6). Credit 4. I

Preparation of organic compounds. Prerequisite: Chemistry 302.

608. Qualitative and Quantitative Organic Analysis. (2-6). Credit 4. II

Analysis of organic compounds. Prerequisite: Chemistry 302.

609. Theory of Organic Chemistry. (4-0). Credit 4. S

The development and applications of chemical theories to organic compounds. Prerequisite: Chemistry 302.

611, 612. Principles of Physical Chemistry. (4-0). Credit 4 each semester. II, S

Study of gas laws, atomic structure, spectra, equilibria, and catalysis. Prerequisite: Chemistry 324.

619. Special Analytical Chemistry. (3-3). Credit 4. II

Study of colorimetric, spectrographic, and other methods of analysis as applied to inorganic substances. Prerequisite: Chemistry 400. (Offered in 1955-56 and in alternate years thereafter.)

621. Chemical Kinetics. (4-0). Credit 4. I

Study of some of the present theories about chemical reaction rates and mechanisms. Prerequisite: Chemistry 324. (Offered in 1954-55 and in alternate years thereafter.)

623. Fluid PVT Relations. (2-0). Credit 2. I

Survey of the more recent methods of investigation in the field, and the different methods of application of the data to the specific problems. Prerequisites: Chemistry 323, 324, 449. (Offered in 1955-56 and in alternate years thereafter.)

624. Physico-Organic Chemistry. (3-0). Credit 3. II

Mathematical and quantitative investigation of organic chemical phenomena. Prerequisites: Chemistry 302, 324. (Offered in 1954-55 and in alternate years thereafter.)

625. Petroleum Chemistry. (3-0). Credit 3. II

Practical and theoretical consideration of chemical reactions of petroleum hydrocarbons. Prerequisites: Chemistry 302, 324. (Offered in 1955-56 and in alternate years thereafter.)

628. The Non-Metallic Elements. (4-0). Credit 4. I

Study of the non-metals and their compounds. Recent developments. Knowledge of German or French desirable. Prerequisites: Chemistry 324; 449 and 452 desirable. (Offered in 1955-56 and in alternate years thereafter.)

630. The Metallic Elements. (4-0). Credit 4. I

Study of the metals and their compounds. Recent developments. Knowledge of German or French desirable. Prerequisites: Chemistry 324; 449 and 452 desirable. (Offered in 1954-55 and in alternate years thereafter.)

633. Alicyclic Compounds. (4-0). Credit 4. I

Occurrence, preparation, and properties of alicyclic compounds with special attention to those having biological activity. Prerequisite: Chemistry 302. (Offered in 1955-56 and in alternate years thereafter.)

635. Heterocyclic Compounds. (4-0). Credit 4. I

Structure, preparation, and properties of heterocyclic compounds with special emphasis on those with biological activity. Prerequisite: Chemistry 302. (Offered in 1954-55 and in alternate years thereafter.)

637. Infrared Spectrometry. (3-3). Credit 4. I

The origin and nature of absorption in the rotational-vibrational region are developed. Analytical applications are made in the laboratory. Prerequisites: Chemistry 302, 324; Mathematics 210. (Offered in 1954-55 and in alternate years thereafter.)

639. Photochemical Analysis. (3-3). Credit 4. II

Study and application of colorimetric methods. Nephelometry, turbidimetry, and fluorometry. Prerequisite: Chemistry 400. (Offered in 1954-55 and in alternate years thereafter.)

641. Structural Inorganic Chemistry. (3-0). Credit 3. II

Study of nuclear and extranuclear structure, isotopes, valency of the elements, and sterochemistry of inorganic compounds. Prerequisites: Chemistry 324, 452. (Offered in 1954-55 and in alternate years thereafter.)

643. Inorganic Complex Compounds. (3-0). Credit 3. II

History, theories, and methods of investigations of inorganic complex compounds. Prerequisites: Chemistry 324, 452. (Offered in 1955-56 and in alternate years thereafter.)

645. Solubility. (4-0). Credit 4. II

Study of experimental methods of solubility measurements. Solubilization and detergency. Introduction to solubility theory. Prerequisites: Chemistry 324, 449; Mathematics 210. (Offered in 1954-55 and in alternate years thereafter.)

647. Polarography. (3-3). Credit 4. II

The treatment of the theory, instrumentation, and practical applications of polarography. Prerequisites: Chemistry 302, 324, 449. (Offered in 1955-56 and in alternate years thereafter.)

685. Problems. Credit 1 to 6. I, II, S

This is a course in special topics to suit small group requirements. The work will deal with the more recent problems and results in the various branches of chemistry. It may be laboratory work or conference and discussion. Prerequisite: Graduate classification.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis or dissertation.

Department of Civil Engineering

Professor S. R. Wright,
Professors J. B. Baty, F. J. Benson, S. J. Buchanan, R. M. Holcomb, H. J. Miles, J. A. Orr, R. L. Peurifoy, C. E. Sandstedt, J. H. Sorrels, H. K. Stephenson; Associate Professors E. L. Harrington, W. H. Nedderman; Assistant Professors C. F. DeVilbiss, L. A. Dubose, B. M. Gallaway, R. E. Schiller, Jr., F. M. Smith; Instructor J. C. Lerret

201. Plane Surveying. (3-3). Credit 4. I, II

Chaining, the adjustments, use and care of compass, transit, level, plane table, and hand instruments; measurements of angles; land surveys and computations; stadia, topographic, city, and general surveying; observations for true meridian and latitude; plotting results. Prerequisite: Mathematics 103.

202. Advanced Surveying. (2-3). Credit 3. I, II

Outlining reconnaissance, preliminary, and location of route surveys; computing and staking out simple and compound curves; cross-sectioning, earth work computations, mass curves; drainage areas, size of drainage structures; topographic mapping; profiles, plans, and calculations of quantities for engineering projects. Prerequisite: Civil Engineering 201.

206. Plane Surveying. (0-3). Credit 1. I, II

Fundamental principles of surveying; use of transit and level; boundary surveys, area computations, profile surveys. Prerequisite: Mathematics 103.

208. Topographic Surveying. (1-3). Credit 2. I, II

Fundamental principles of surveying; use of transit and level; special emphasis placed on use of plane table in topographic mapping. Prerequisite: Mathematics 103.

300s. Summer Surveying Practice. Credit 5. S

Six weeks of surveying practice. Horizontal and vertical control; base line measurements; transit-stadia surveys; plane table surveys; boundary surveys; area and co-ordinate computation; polaris observations; route surveys. Prerequisite: Civil Engineering 202.

305. Mechanics of Materials. (3-0). Credit 3. I, II, S

Stresses, deformation, mechanics of pipes, beams, shafts, columns, riveted joints, welded joints, elastic curve and deflections, moment areas, combined stresses, resilience. Prerequisites: Mathematics 210; Mechanical Engineering 212 or the equivalent.

311. Hydraulics. (3-0). Credit 3. I, II

The laws governing the action of water at rest and in motion, as related to engineering problems; the flow of water in pressure mains, sewers, aqueducts, open channels, and in rivers; measurement of the flow of water by nozzle, orifices, weirs and meters; flow of viscous fluids. Prerequisite: Mechanical Engineering 212 or equivalent.

315. Strength of Materials Laboratory. (0-2). Credit 1. I, II, S

Determination of the strength, ductility, modulus of elasticity, and other properties of engineering materials. Tests of timber, steel, cast iron, concrete, and reports showing results. Prerequisite: Civil Engineering 305 or registration therein.

336. Hydraulics Laboratory. (0-2). Credit 1. I, II

Calibration of nozzles, orifices, water meters, weirs, pressure gauges; measurement of pipe friction; measurement of pipe flow with pitot instrument and Venturi meter; efficiency tests on impulse motor, hydraulic ram, and centrifugal pump; solution of assigned problems. Prerequisite: Civil Engineering 311 or registration therein.

338. Elementary Hydrology. (2-0). Credit 2. I, II

An elementary study of rainfall and runoff and the hydraulics of culverts and drainage structures; flow in open channels; pumps. Prerequisite: Civil Engineering 311.

344. Plain and Reinforced Concrete. (2-3). Credit 3. I, II, S

Properties of concrete; plain concrete structures; theory of stress distribution in reinforced concrete in bending, shear, bond, and anchorage; design of typical beams, slabs, and walls; stress distribution in spiral and tied columns with axial and eccentric loading; design of typical columns; interpretation of typical current specifications and use of available tables and charts; economic factors. Prerequisites: Civil Engineering 305, 345.

345. Analysis of Simple Structures. (3-3). Credit 4. I, II, S

An introduction to structural engineering; loads, reactions, and structural force systems; algebraic and graphical computations of reactions and stresses in beams, three-hinged arches, and trussed structures used as roofs, floor systems, and bridges; influence lines and criteria for moving loads; analysis of indeterminate structures by the general deflection procedure and by moment distribution; reactions and stresses in bents. Prerequisite: Civil Engineering 305 or registration therein.

346. Design of Members and Connections. (2-3). Credit 3. I, II, S

The design of tension members, compression members, beams, riveted joints, and welded joints. Theory and practice as indicated in typical current specifications. Prerequisites: Civil Engineering 305, 345.

401. Water and Sewage Treatment. (2-2). Credit 3. I, II †

Principles and methods of water purification and sewage treatment and disposal; laboratory demonstrations of control tests and correlation of results with treatment plant operation; interpretation of reports; inspections of local plants. Prerequisites: Chemistry 102; Civil Engineering 311.

402. Water Supply and Sewerage Practice. (2-2). Credit 3. I, II †

Development of sources of water supply; determination of the quantity of storm water and domestic sewage; short problems relating to water supply distribution systems, sewer systems, and the general features of water purification and sewage treatment plants; appurtenances and treatment plant equipment; local inspections of water supply and sewerage systems. Prerequisites: Civil Engineering 338, 401.

403. Sanitary Design. (2-3). Credit 3. II †

Practical problems in the design of sewer systems and appurtenances; sewage treatment plants; water collection and distribution systems; water purification plants. Prerequisite: Civil Engineering 402.

406. Sanitation and Public Health. (3-0). Credit 3. I †

Relation of sanitation to public health; residential water supply and excreta disposal methods; municipal sanitary work, including refuse disposal; plumbing; control of food supplies; mesquito, fly, and rodent control; sanitation of swimming pools; industrial hygiene; organization of health departments. Prerequisite: Junior classification.

407. Roads and Pavements. (3-0). Credit 3. I, II †

A brief study of country roads and city pavements. Highway location, design, construction, and maintenance; road laws, finances, organization and supervision briefly considered. The text is supplemented by lectures, the use of bulletins, models, and samples of materials. Prerequisites: Civil Engineering 202, 338 or registration therein, 465.

408. Municipal Administration. (3-0). Credit 3. I, S †

City government, including the city manager plan; relation of city to state; administration of city departments; public utilities; city planning. Prerequisite: Junior classification.

409. Sanitary Laboratory. (2-3). Credit 3. I †

Theory and practice in fundamental tests used in water and sewage treatment processes. Prerequisite: Civil Engineering 401.

417. Bituminous Materials. (2-3). Credit 3. II †

Origin, production, specifications, and tests of bituminous materials and mixtures used in the construction and maintenance of roads and pavements. Prerequisites: Senior classification in engineering and Civil Engineering 407 or registration therein.

443. Materials of Construction. (1-3). Credit 2. I, II †

Laboratory tests, supplemented with theory, of aggregates, cement, concrete mixtures, and masonry materials. Prerequisite: Senior classification.

448. Engineering Economy. (2-0). Credit 2. II, S †

Analysis of operating costs of engineering projects including interest, depreciation, fixed costs, overhead. Comparison of first cost economy versus ultimate economy. Prerequisite: Junior classification in engineering.

457. Traffic and Its Control. (3-0). Credit 3. I †

A study of vehicle operating characteristics, traffic flow, geometric design of roads, streets, and intersections, and methods of traffic control. Prerequisites: Civil Engineering 202, 407 or registration therein; Physics 204.

458. Hydraulic Engineering. (3-0). Credit 3. II †

Flow in pipes and complex pipe systems; non-uniform flow in open channels; pumping machinery; elementary hydraulic model theory. Prerequisite: Civil Engineering 338.

463. Hydrology. (2-3). Credit 3. I †

A study of the occurrences and measurements of precipitation and stream flow; relations between precipitation and run-off; estimating seepage; evaporation, run-off; surface, and flood discharges for drainage basins. Prerequisite: Civil Engineering 338.

465. Soil Mechanics and Foundations. (2-2). Credit 3. I, II, S †

An elementary introduction to soil mechanics and its application to the usual problems encountered in civil and architectural engineering. The origin, formation processes, and types of soils are reviewed. Methods of exploration and soil testing required for the design of various types of foundations, retaining walls, bridge abutments, coffer dams, earth dams, and other engineering structures. Prerequisites: Civil Engineering 305; Geology 320 or 422.

468. Statically Indeterminate Structures. (2-3). Credit 3. I †

Definitions, functions, and identification of statically indeterminate structures; their uses, advantages, and disadvantages; general method of design; general method of analysis based on deflections; deflection computation for beams by elastic-curved-beam theory, moment areas, and conjugate beam; deflections of trusses by virtual work and Williot diagrams; preliminary designs; formulation and solution of simultaneous equations; superposition, final stresses; moment distribution; applications in the design of arches, rigid frames, and continuous beams. Prerequisite: Civil Engineering 345.

473. Cost Estimating. (3-0). Credit 3. I, II, S †

Approximate and detailed estimates of the cost of construction projects including earthwork, foundations, concrete, masonry, steel, and miscellaneous items. Costs are developed to include materials, equipment, labor, overhead, and profit. Prerequisite: Senior classification.

474. Contracts and Specifications. (2-0). Credit 2. I, II †

Study of types of contracts frequently encountered in engineering practice, including agency, tort, real estate, sales, transportation. Preparation of representative specifications and contractural documents for engineering projects. Prerequisite: Senior classification in engineering or architecture.

476. Seminar. (1-0). Credit 1. I, II †

A study of the methods of job procurement subsequent to graduation including letters of application and job interviews; responsibilities and obligations of the young civil engineer; professional ethics; membership in professional societies; professional registration; lectures by staff and practicing engineers. Prerequisite: Senior classification.

478. Construction Plant and Methods. (3-0). Credit 3. II †

Plant and equipment selection for earthwork, foundations, concrete and structural steel, based on performance and economy. Construction schedules, progress reports, and performance records. Prerequisite: Senior classification in engineering or architecture.

482. Aerial Photogrammetry. (2-3). Credit 3. I †

A study of photogrammetric optics, characteristics of aerial photographs, aerial cameras, map projections, ground control, radial plots, mosaics, interpretation of aerial photographs, stereoscopic plotting instruments, and mapping form from oblique photographs. Prerequisite: Civil Engineering 201.

483. Analysis and Design of Structures. (2-3). Credit 3. I, II †

The over-all procedure of analysis and design, including functions, loads, layouts of force systems, analysis, design drafting, specifications, cost comparisons, and maintenance as applied to typical simple bridge and building structures, design of plate girders, trusses, and reinforced concrete buildings. Prerequisites: Civil Engineering 344, 346, 465.

484. Design of Bridges and Buildings. (2-3). Credit 3. II †

Continued practice in the over-all process of design as applied to more complex structures, continuous beam bridges, rigid frames, multi-story buildings. Prerequisite: Civil Engineering 483.

FOR GRADUATES

601, 602. City Management. (4-0). Credit 4 each semester. I, II

Development of European and American cities; forms of city government; functions of the city manager; administration of municipal affairs; organization of city departments; city finances; public utilities; fire prevention and protection; police administration; parks and playgrounds; public health and welfare; housing; city planning.

603. Stream Sanitation and Sewage Treatment. (4-0). Credit 4. I

Detailed studies of various methods of sewage treatment and effects on stream sanitation. Prerequisite: Civil Engineering 402.

604. Water Supply Engineering. (4-0). Credit 4. II

Source of supply, special problems of distribution, corrosion control, special water treatment problems. Prerequisite: Civil Engineering 402.

607, 608. Environmental Sanitation. (4-0). Credit 4 each semester. I, II

Detailed study of environment and its relation to disease, covering malaria and its control; rodent control; sanitation of milk, shellfish, and other foods; collection and disposal of municipal refuse; sanitary aspects of air conditioning; housing sanitation, including plumbing and ratproofing; rural water supply and excreta disposal; sanitary inspection procedure.

609. Industrial Hygiene. (2-2). Credit 3. I

Occupational hazards and diseases; industrial poisons and dusts; methods of air examination; factory sanitation.

610. Industrial Wastes. (4-0). Credit 4. II

Amount and characteristics of the common industrial wastes; their effects upon sewage treatment; methods of treatment. Prerequisite: Civil Engineering 401 or the equivalent.

613. Advanced Sanitary Laboratory. (2-4). Credit 3. II

Preparation of media and solutions; additional tests on water, sewage, milk and other food products that are not usual routine tests; study and evaluation of new test procedures and techniques. Prerequisite: Civil Engineering 409.

621. Advanced Reinforced Concrete Design. (3-3). Credit 4. II

Plastic flow, pre-stressed concrete, torsion, deep beams; domes, ribbed arch roofs, flat-slab and girderless floors; rectangular tanks. Prerequisite: Civil Engineering 483.

623, 624. Design of Complex Structures. Credit 2 to 6 each semester. I, II

Design of long-span and continuous bridges, multi-story buildings, storage structures, towers and other complex structures. Choice of subjects each semester to depend on interests of students. Prerequisite: Civil Engineering 632 or approval of Head of Department.

625, 626. Highway Construction and Materials. (3-3). Credit 4 each semester. I, II

The fundamentals of traffic flow and traffic control. Alignment design for safe vehicle operation, highway capacity and cross-section design, design of drainage structures. Design and construction of subgrades and rigid and flexible pavements. Design of intersections. Laboratory consists of field and office problems supplementing the theory. Prerequisite: Civil Engineering 407, 465.

627, 628. Hydraulic Engineering. (3-3). Credit 4 each semester. I, II

Advanced hydrology, water power development, flood control, irrigation. Prerequisite: Civil Engineering 338.

629. Hydraulics of Open Channels. (3-3). Credit 4. I

Advanced problems in uniform and non-uniform flow in open channels; the hydraulic jump; control section; backwater profiles. Prerequisite: Civil Engineering 338.

630. Ground Water Hydrology. (1-3). Credit 2. II

A quantitative study of the application of the principles of hydrology to the development and use of ground water supplies. Prerequisites: Geology 620 or the equivalent, registration in 625.

631. Advanced Structural Analysis. (3-3). Credit 4. I

Review and correlation of general procedures for analyzing indeterminate structures, deflections by structural geometry and by energy considerations; simultaneous equations by deflections and by energy considerations; neutral point and column analogy methods for fixed arches and frames; application of moment distribution to complex structures. Prerequisite: Civil Engineering 483.

632. Advanced Structural Design. (2-6). Credit 4. II

Design of complex and indeterminate structures; built up columns; members with variable section; grillage foundations; design and detailing of continuous frames, arches, towers, and building frames. Prerequisites: Civil Engineering 468, 483.

633. Advanced Mechanics of Materials. (4-0). Credit 4. I

Principal stresses and theories of failure of elastic action; stress concentration; unsymmetrical bending; mechanical methods for study of internal stresses; special problems such as bending in flat plates, buckling of webs, bending in curved beams and hooks.

634. Airfield Planning and Design. (2-0). Credit 2. II

Study of regional planning air traffic routing, landing requirements, methods for development of master plans for site selection, airfield design requirements involving layouts, pavement selection, and design. Review and application of criteria of design of drainage for all types of fields.

635, 636. City Street Pavements. (2-0). Credit 2 each semester. I, II, S

Financing municipal street improvements, methods of assessment, Texas paving laws. Pavement types, costs, designs, and traffic characteristics. Street grades, widths, intersections, and appurtenances. Special problems. Prerequisite: Civil Engineering 407.

644. Structural Model Analysis. (1-3). Credit 2. II

The mechanical analysis of stresses in statically indeterminate structures by means of models. The use of the Beggs apparatus in analyzing complicated structures will be given particular attention. Practice period will be devoted to the making and testing of structural models. Prerequisite: Civil Engineering 468.

649. Soil Mechanics. (3-4). Credit 4. I

A study of foundation materials as they exist and of the various types of soils, their physical properties, testing procedure, and principles of classification. For advanced undergraduates and for graduate electives. Prerequisites: Civil Engineering 465; Geology 320.

650. Soil Mechanics. (3-4). Credit 4. II

A study of theory and practice in foundation explorations, laboratory investigations of undisturbed foundation samples, stress distribution through soils; problems in foundation design, correlation of settlement data from actual observations on the behavior of existing structures, stability of embankments, backfill pressures. Prerequisite: Civil Engineering 649.

651. Advanced Theory and Application of Soil Mechanics. (3-3). Credit 4. I

Special lectures, discussions and applications of theory to solution of major problems encountered in practice of soil engineering, embracing the fields of seepage, earth work design, foundation design, port structures, and special problems. Prerequisite: Civil Engineering 650.

685. Problems. Credit 1 to 6 each semester. I, II, S

A course offered to enable majors in civil engineering to undertake and complete with credit in their particular fields of specialization limited investigations which do not fall within their thesis research and which are not covered by other courses in the established curriculum. Credit for this course normally will be limited to four credits per semester, but in exceptional circumstances, the Head of the Department may approve a maximum of six credits in one semester or summer term.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis or dissertation.

Courses in Conservation

There is no separate Department of Conservation. The following courses, which cover various phases of the field, may be elected by interested students:

Agricultural Economics 422. Land Economics. (3-0). Credit 3. I, II

Agricultural Engineering 305. Terracing and Drainage. (3-3). Credit 4. I, II

Agricultural Engineering 333. Surveying and Water Utilization. (2-3). Credit 3. I, II

Agronomy 301. Introductory Soils. (3-2). Credit 4. I, II, S

Agronomy 410. Soil Morphology. (1-4). Credit 2. II

Agronomy 413. Soil and Crop Management. (3-0). Credit 3. II

Agronomy 417. Pasture Management. (2-2). Credit 3. I, II

Agronomy 418. Soil Conservation. (3-3). Credit 4. I, II, S

Agronomy 422. Soil Fertility. (3-4). Credit 4. I, S

Agronomy 443. Soil Microbiology. (2-3). Credit 3. II

Agronomy 445. Soil Physics. (2-3). Credit 3. II

Geography 312. Conservation of Natural Resources. (3-0). Credit 3. II

Range and Forestry 308. Farm Forestry. (2-3). Credit 3. II

Range and Forestry 401. Range Improvement and Maintenance. (2-3). Credit 3. I, II

Rural Sociology 417. Rural Social Problems. (3-0). Credit 3. I, II

Wildlife Management 201. Wildlife Conservation and Management. (3-0). Credit 3. I, II

Wildlife Management 304. Conservation and Management of Fishes. (3-0). Credit 3. II

Department of Dairy Husbandry

Professor I. W. Rupel,
Professors A. L. Darnell, A. V. Moore; Associate Professors R. E. Leighton, I. I. Peters; Assistant Professor W. C. Van der Zant

202. Dairying. (2-2). Credit 3. I, II, S

A survey of the dairy industry; dairy breeds, standards for selection and culling, herd replacements, feeding, management, and health maintenance. Food value of milk, tests for composition and quality, utilization and processing of market milk and dairy products. Prerequisite: Chemistry 101.

301. Market Milk. (3-2). Credit 4. I †

Nutritional value of milk; milk and public health; organization of city milk supplies; processing and distribution and inspection of market milk. Prerequisites: Biology 206; Dairy Husbandry 202.

303. Dairy Cattle Judging. (0-3). Credit 1. I

A study of comparative judging of dairy cattle. Prerequisite: Dairy Husbandry 202.

307. Judging Dairy Products. (0-3). Credit 1. II

Practice in judging and scoring dairy products according to established market grades. Prerequisite: Dairy Husbandry 202.

310. Advanced Dairy Cattle Judging. (0-2). Credit 1. II

Advanced study of dairy cattle judging with particular attention to show ring type and classification. Prerequisite: Dairy Husbandry 303.

311. Technical Control of Dairy Products. (2-6). Credit 4. II †

Methods of analysis of milk and milk products, and their use in controlling the composition and purity of dairy products. Prerequisites: Chemistry 223, 231; Dairy Husbandry 301.

313. Dairy Products Plant Operation. (2-2). Credit 3. I

The influence of production and processing methods on the physical, chemical, and sanitary properties of dairy products. May not be taken for credit toward graduation by dairy husbandry majors. Prerequisite: Enrollment in veterinary medicine.

316. Butter and Cheese Manufacture. (3-4). Credit 4. II †

Processing procedures in the commercial manufacture of domestic and foreign cheeses; creamery butter, manufacture. Prerequisites: Dairy Husbandry 301, 320. (Offered in 1954-55 and in alternate years thereafter.)

320. Bacteriology of Dairy Products. (3-3). Credit 4. I †

Relation of micro-organisms to quality in milk and milk products; starter and fermented milk culture management; sanitary control on farms and in commercial dairies; standard analytical procedures according to the American Public Health Association. Prerequisite: Biology 206.

324. Commercial Dairy Products. (3-0). Credit 3. II

A modification of Dairy Husbandry 316, 407, 415. Prerequisite: Dairy Husbandry 202. (Offered in 1955-56 and in alternate years thereafter.)

326. Food Preservation and Decomposition. (3-3). Credit 4. II †

The microbiology of human foods and accessory substances. A study of raw and processed foods, emphasizing the physical, chemical, and biological phases of spoilage. Standard industry techniques of inspection and control. Prerequisite: Biology 206.

407. Ice Cream Making. (2-3). Credit 3. I †

Mixing and freezing of ice cream, sherbets, and ices, and the physical and chemical principles involved; ice cream plant equipment; flavoring materials; merchandising. Prerequisites: Agricultural Engineering 213; Dairy Husbandry 202.

410. Dairy Plant Management. (1-2). Credit 2. II †

Dairy plant operating efficiency. Special economy problems incident to plants handling fluid milk, butter, cheese, and concentrated dairy products. Prerequisite: Senior classification in dairy husbandry. (Offered in 1955-56 and in alternate years thereafter.)

415. Condensed Milk. (1-2). Credit 2. I †

The food value, manufacture, and distribution of condensed and evaporated milk, milk powder, milk sugar, casein, and other milk products; a study of milk substitutes. Prerequisites: Chemistry 231 or equivalent; Dairy Husbandry 301; one semester of physics.

417. History and Development of Dairy Cattle. (2-2). Credit 3. I †

Dairy farming and its place in a permanent system of agriculture. Origin and history of dairy cattle and dairy cattle breeds. Selection of herd sires and females based on records of production and type classification. Herd analysis and herd improvement through breeding and selection. Prerequisites: Dairy Husbandry 202; Genetics 301.

418. Feeding and Management of Dairy Cattle. (3-2). Credit 4. II †

The care, feeding, and management of the dairy herd; calf raising, developing the dairy heifer; dairy farming. Prerequisites: Animal Husbandry 303 or Biochemistry and Nutrition 401; Dairy Husbandry 202.

420. Dairy Management. (2-2). Credit 3. I

A combination of Dairy Husbandry 417, 418 for agricultural education students. Prerequisites: Animal Husbandry 303; Dairy Husbandry 202; Genetics 301.

421. Seminar. (1-0). Credit 1. I, II †

A review of current dairy literature and presentation of papers on selected dairy topics. May be elected a second time for one additional credit. Prerequisite: Senior classification.

423. Problems in Dairy Production. Credit 3. S †

A study of problems in dairy cattle feeding, breeding, and management, and in commercial milk production. A three-weeks course offered in summer sessions only. Prerequisite: Dairy Husbandry 418 or 420 or the equivalent.

451. Special Problems. Credit 1 to 4. I, II †

Special problems in dairy production and dairy manufactures. May be repeated for additional credit when less than four credits have been earned. Prerequisites: Senior classification; approval of Head of Department.

FOR GRADUATES

601, 602. Dairy Production. (2-6). Credit 4 each semester. I, II

An advanced study of dairy production, feeding, breeding, and management. Prerequisite: Dairy Husbandry 418.

603, 604. Dairy Manufactures. (2-6). Credit 4 each semester. I, II

An advanced study of dairy manufactures. Prerequisites: Dairy Husbandry 316, 407, 415.

685. Problems. Credit 1 to 4 each semester. I, II, S

A study of research methods and a review of scientific literature dealing with individually selected problems in production or manufactures and not pertaining to thesis or dissertation. Prerequisites: Dairy Husbandry 418 for production majors; Dairy Husbandry 316 and 407 or 415 for manufactures majors.

691. Research. Credit 1 or more each semester. I, II, S

Research leading to thesis or dissertation in the respective fields of dairy production and dairy manufactures. Prerequisites: Dairy Husbandry 418 for production majors; Dairy Husbandry 316 and 407 or 415 for manufactures majors.

Department of Economics

Professor W. H. Delaplane,
Professors I. G. Adams, A. F. Chalk; Associate Professors Aurelius Morgner, H. R. Putnam; Assistant Professors M. H. Butler, R. G. Layer, J. M. Waller; Instructors M. G. Daniels, W. G. Modrow

203. Principles of Economics. (3-0). Credit 3. I, II, S

The nature of the economic problem, national income measurement, the role of prices in production and distribution. The first half of a year course.

204. Principles of Economics. (3-0). Credit 3. I, II, S

Management and control of economic resources, government finance and the banking system, international trade, comparative economic systems. The second half of a year course.

205. Principles of Economics. (3-0). Credit 3. I, II

A survey course designed for sophomores specializing in technical fields. The economic problem; the measurement and determination of natural income; money, credit, and banking; the theory of price, production, and distribution. Cannot be substituted for Economics 203, 204.

311. Money and Banking. (3-0). Credit 3. I, II, S

The fundamental principles of money, credit, and banking and their exemplification in modern currency and banking history, particularly that of the United States. Special attention is given to present-day conditions and problems. Prerequisites: Economics 203 and 204, or 205, or 403.

318. Economics of Labor. (3-0). Credit 3. I, II, S

Special attention is given to the labor force, unemployment, labor markets, wages, work periods, the aged worker, industrial accidents, and phases of social security. Prerequisites: Economics 203 and 204, or 205, or 403.

319. Economic Development of the United States. (3-0). Credit 3. I, II, S

A survey of the economic development of the United States from colonial times to the present. The course will describe the origin and development of our economic and social institutions and provide a basis for an understanding of our present economic problems. Prerequisites: Economics 203 and 204, or 205, or 403.

320. Economic Development of Europe. (3-0). Credit 3. II

A survey of the steps by which economic activities have evolved from the Medieval period into the complex capitalistic economy of today. Special emphasis on the development of the wage system, the Industrial Revolution, the expansion of markets, the ebb and flow of industrial activities, the financial structure, and the relation of industrial development to political policy. Prerequisites: Economics 203 and 204, or 205, or 403.

321. International Trade and Finance. (3-0). Credit 3. I

A study of international economics, including the theory of international trade, foreign exchange, and the balance of payments; tariffs, exchange controls, and other barriers to trade; international investment; and contemporary problems of international disequilibrium. Prerequisites: Economics 203 and 204, or 205, or 403.

323. Economic Analysis. (3-0). Credit 3. I †

The importance of prices in directing production and distributing income under both competitive and monopolistic market situations is considered, along with a survey of the effects of governmental policies on the pricing system. Prerequisites: Economics 203 and 204, or 205, or 403.

324. Comparative Economic Systems. (3-0). Credit 3. II

A study and comparison of the present economic systems of the leading nations. Prerequisites: Economics 203 and 204, or 205, or 403.

403. Principles of Economics. (3-0). Credit 3. I, II, S

A one-semester survey course for upperclassmen. Measurement of national income and its determination by saving and investment; use of monetary and fiscal policy for the promotion of economic stability; the role of business organization and demand and supply. May not be taken for credit if student has completed Economics 203 and 204, or 205. Prerequisite: Junior classification.

412. Public Finance. (3-0). Credit 3. II †

A survey of all aspects of government finance. The main topics studied are public expenditures, taxation, public debt, and financial administration at federal, state, and local levels. Attention will be given to spending and borrowing policies of the government, also to budgeting, and the public role of taxation as an instrument of fiscal policy. Prerequisites: Economics 203 and 204, or 205, or 403.

421. Government and Business. (3-0). Credit 3. I

The problems created by the existence of monopoly power in those industries in which entrance of new firms and the prices charged are not controlled by governmental commissions. An attempt is made to examine the extent and intensity of this monopoly power and our past and present public policies toward it. Prerequisites: Economics 203 and 204, or 205, or 403.

422. Monetary Problems and Policies. (3-0). Credit 3. II †

The relationship of money to prices and income, to domestic economic stability, and to international monetary equilibrium. Prerequisite: Economics 311.

424. Economics of Transportation. (3-0). Credit 3. II

A description of the structure and functioning of our highway, rail, water, and air transportation systems; the economic significance of transportation in our society; and an analysis of the theory and practice of regulation of the transportation industries by the Interstate Commerce Commission and other governmental agencies. Prerequisites: Economics 203 and 204, or 205, or 403.

433. Seminar. (1-0). Credit 1. II †

Primarily for students majoring or minoring in economics. A study of methodology, scope, and philosophy of economic science, followed by individual investigation of some current economic problems. Prerequisite: Approval of the Head of the Department.

434. Economic Analysis of the South. (3-0). Credit 3. II

A study of the economic resources and problems of the South in the light of their geographic and historical background and of current movements for improvements. Prerequisites: Economics 203 and 204, or 205, or 403.

435. Collective Bargaining and Labor Disputes. (3-0). Credit 3. I †

A study of the economic significance of collective bargaining including techniques, union contracts, and contract formation. Prerequisite: Economics 318 or approval of the Head of the Department.

437. Government and Labor Relations. (2-0). Credit 2. II †

A study of court decisions and laws regulating and protecting labor in the interest of national welfare with attention given to the social and economic environment in which such regulations were developed. Special attention is given to the major legislative acts of Congress and some of the state laws pertaining to labor relations, with some attempt to evaluate these in the light of a changing conception of labor relations. Prerequisite: Economics 318 or approval of the Head of the Department.

440. Latin-American Trade. (3-0). Credit 3. II †

A study of Latin-American trade and commercial policies, together with an analysis of the economic problems of this region. Prerequisite: Economics 321 or approval of the Head of the Department.

441. Russian Economy. (3-0). Credit 3. I †

A study of the development of Russian trade, agriculture, industry, government, finance, and standards of living in successive periods in relation to the historical, geographic, economic, and ideological background. Prerequisites: Economics 203 and 204, or 205, or 403.

443. Contemporary Economic Problems. (3-0). Credit 3. I

A study of current economic problems which lie within the following major areas of economic policy: economic stability, control of monopoly power, distribution of income, and international economic relations. Prerequisites: Economics 203 and 204, or 205, or 403.

FOR GRADUATES

601. History of Economic Thought. (4-0). Credit 4. I

Primary emphasis is given to the Classical Period of 1776-1848, although a brief survey of pre-classical economic thought is made at the beginning of the course. Students are expected to read extensively in original sources, and special attention is devoted to the works of Smith, Malthus, West, Ricardo, and Mill. Prerequisite: Approval of the Head of the Department.

602. History of Economic Thought. (4-0). Credit 4. II

Following a general survey of the wage-fund controversy, an intensive study is made of marginal utility theory as developed by Menger, Jevons, Boehm Bawerk, etc., followed by the Neo-Classical period. The final portion of the course is devoted to the synthesis of classical and marginal utility theory found in Marshall's system. Prerequisite: Approval of the Head of the Department.

606. The Labor Movement. (4-0). Credit 4. II

A historical survey of the evolution of labor movements and programs. Discussion of economic principles involved in the leading problems of labor. Prerequisite: Economics 318.

607. Contemporary Economic Theory. (4-0). Credit 4. II

This is a survey of the more important contributions to economic thought which have been made during the last generation. The current writings of important contemporary economists are read and discussed. Prerequisite: Economics 323.

611. Government Fiscal Policy. (3-0). Credit 3. I

This course concerns the development of modern national income analysis and the role of fiscal policy in promoting economic stability. The conceptual problems of measuring national income are considered, analytical systems explaining the determination of national income are surveyed, and contemporary policy recommendations for the maintenance of full employment without inflation are discussed. Prerequisite: Economics 311 or 412.

613. International Economic Policies. (3-0). Credit 3. II

A critical examination of governmental policies toward international trade both at home and abroad; includes study of the role of the individual and the state in foreign trade; examines export and import controls, exchange control and exchange stabilization funds; considers tariff and rehabilitation policies of the government and their relation to foreign trade. Prerequisite: Economics 321.

685. Problems. Credit 1 to 3 each semester. I, II, S

Individual problems not related to a thesis or dissertation. Prerequisites: Graduate classification with major or minor in economics; approval of the Head of the Department.

691. Research. Credit 1 or more each semester. I, II, S

Thesis research.

Department of Education and Psychology

Professor G. B. Wilcox,
Professors T. D. Brooks, G. P. Parker, W. A. Varvel; Associate Professors M. S. Kavanaugh, A. J. Kingston, Jr.; Assistant Professor S. A. Kerley

EDUCATION

The courses in education have been designated, with the approval of the Texas Education Agency, according to their particular field of specialization. All courses are classified as professional education, and additional designations are shown in parentheses following certain course descriptions.

The following classifications may be applied to the courses listed when so designated by the College, according to the type of problems undertaken by the class. (See next page.)

Elementary Education.....425, 439, 619, 685, 691
Secondary Education.....425, 439, 685, 691
Curriculum and Methods.....611, 619, 625, 626, 627, 628, 685, 691
Administration.....625, 626, 627, 628, 685, 691
Supervision.....625, 626, 627, 628, 685, 691
Counseling.....610, 625, 626, 627, 628, 685, 691

121. An Introduction to Education. (3-0). Credit 3. I, S

The development of the American system of education; factors and emphasis contributing to its universality; comparative study of systems of other countries, noting distinguishing characteristics of the American system as to its extent, organization, administration, supervision, and support. Designed not as an indoctrination for teacher candidates but as a cultural background course.

319. Elementary School Methods. (3-0). Credit 3. S

This course is designed to meet the needs of the students in the basic principles and practices underlying the curriculum of the modern elementary school. Major emphasis will be given methods of learning, methods of teaching, teaching devices, technique of teaching, and modern principles and practices in the elementary school. Prerequisite: Psychology 307. (Curriculum and Methods, Elementary Education)

320. Elementary School Administration. (3-0). Credit 3. S

The functional study of the participation in, and the organization and administration of the elementary school. Designed to meet the needs of elementary school principals, supervisors, teachers, and school superintendents. Prerequisite: Twelve hours of education. (Administration, Elementary Education)

321. Secondary School Methods. (3-0). Credit 3. I, S

Methods of teaching high school subjects; for students who expect to teach in secondary schools. (Curriculum and Methods, Secondary Education)

322. Secondary School Administration. (3-0). Credit 3. II, S

The responsibilities of the teachers for the administration of the secondary school. (Administration, Secondary Education)

421. History and Philosophy of Education. (3-0). Credit 3. I, S †

This course is designed to supply teachers and other educators with a more complete background for their advanced educational programs. A critical study and evaluation of the educational achievements of the periods of development of nations and peoples of the world and the part played by education in the formation of their attitudes toward political, social, religious, and cultural accomplishments that are recognized as lasting contributions to human welfare. Prerequisite: Twelve hours of advanced education.

422. History of American Education. (3-0). Credit 3. II, S †

The origin and development of a system of free public education in America. The impelling motives that prompted the leaders and the people to strive for a system of free public education. The philosophy of education in the United States will be studied in relation to economic, social, and political development. Prerequisite: Senior classification or approval of the instructor.

425. Supervised Student Teaching. (2-12). Credit 6. II

Observation and participation in classroom activities. Techniques of teaching the student's special subject. Two hours per week devoted to student's problems. Preparation of units of work preparatory to teaching. Supervised teaching. Prerequisites: Senior classification; approval of the Head of the Department.

426. Tests and Measurements. (3-0). Credit 3. I, S †

The development of scientific measurement. The fundamental principles of sound measurement and an intensive study of the methods of appraising achievements of instructional objectives. Primary emphasis upon methods of constructing teacher-made objectives tests and techniques for improving other types of written examination. Prerequisite: Education 320 or 321. (Administration—Elementary or Secondary)

427. Principles of Guidance. (3-0). Credit 3. II, S †

Introduction to the field of guidance and student personnel work. Treatment of principles underlying the aims, methods, and instruments employed in counseling and guidance. Attention to relationship of instruction and guidance. Prerequisite: Psychology 207 or 301. (Administration)

431. An Introductory Course in Techniques of Curriculum Construction. (3-0). Credit 3. I, S †

An introduction to the problems faced in the work of curriculum production and the current practices employed in solving them. Emphasis is placed upon preliminary survey, planning the curriculum, organizing materials, and course of study construction. Prerequisite: Education 321. (Curriculum and Methods)

433. Improvement of Reading, Spelling, and Speech. Credit 3. S †

Application of phonetics in the teaching of reading, spelling, and speech in the primary and elementary grades. A study of International Phonetic Alphabet with reference to speech organs and correct pronunciation. (To be given on a full day schedule in a three-weeks period. Ten hours per week to be given over to demonstration teaching.) Prerequisite: Senior or graduate classification. (Curriculum and Methods, Elementary Education)

434. Improvement of Reading, Spelling, and Speech. Credit 3. S †

An advanced course in the application of phonics in teaching reading, spelling, and speech to pupils in the upper level of the primary grades. Prerequisite: Approval of the instructor. (Curriculum and Methods, Elementary Education)

435. Audio-Visual Education. (3-0). Credit 3. II, S †

Basic philosophy of visual education; a study of areas of instruction in relation to visual aids; scope of materials, equipment and materials available; technical information and practice in the operation and use of types of equipment; production and development of other materials for use by the teacher. This course is designed primarily for teachers and advanced students in education. Prerequisite: Education 321.

439. Educational Statistics. (3-0). Credit 3. II, S †

Statistical techniques for classroom teachers, principals, students of psychology and education and educational research. Problems originating in classrooms, offices of principals, laboratories of educational investigators will be used for illustrative materials and exercises. Not open to students who have received credit for any other courses in statistics. Prerequisite: Six hours of advanced education.

441. Practicum in Remedial Reading. (2-3). Credit 3. S †

A course designed to familiarize the student with diagnostic and remedial reading techniques. Each participant will be given an opportunity to work, under supervision, with students enrolled in the College reading improvement course. Prerequisites: Senior or graduate classification and approval of the instructor. (In general the student must be pursuing a course of training leading to teaching, counseling, or personnel work, and must have successfully completed at least 9 hours in education.) (Curriculum and Methods)

English 461. Teaching of Language and Composition. (3-0). Credit 3. S †

See page 306 for a full description of this course.

FOR GRADUATES

604. Development of Education in Texas. (2-0). Credit 2. II

The origin and development of public school education in Texas.

607. Programs and Procedures in Supervision. (3-0). Credit 3. II, S

Designed for teachers, supervisors, and administrators. Deals with the philosophy, organization, and administration of supervision of both the elementary school and the seeondary school. Prerequisites: Education 321, 426, 431, or their equivalents. (Supervision—Elementary or Secondary)

608. Administration of Local School Finance. (3-0). Credit 3. I, S

A study of school funds on the local school level; sources, budgeting, systems of accounting and reporting. Supply management as related to school efficiency. (Administration)

609. Public School Laws. (2-0). Credit 2. II, S

A review of the constitutional provisions, statute laws, court decisions, and regulations governing the public schools, with special reference to Texas. (Administration)

610. Pupil Accounting. (2-0). Credit 2. I, S

A study of devices to record and improve census taking and attendance; classification and promotional schemes; school record system; school reports and pupil appraisal studies; marking systems. (Administration)

611. Newer Techniques of Teaching. (4-0). Credit 4. I, S

A study of teaching methods and techniques. Application of the newer methods and techniques of teaching to materials on the elementary and secondary school levels. Prerequisite: Education 321 or its equivalent. (Methods—Elementary or Secondary)

612. Interpreting the Schools to the Public. (2-0). Credit 2. II, S

A study of types of programs designed to give to the public comprehensive information of the local school; devices and media used in presenting information. (Administration)

613. The School Plant. (3-0). Credit 3. II, S

A study of plans for determining the extent and character of present and future building and equipment needs of a school unit; efficiency of present plant; operation and maintenance; planning the building program. (Administration)

614. State School Finance. (2-0). Credit 2. I, S

A study of taxation for school support; apportionment of state school funds; endowments and subsidies; equalizing educational opportunities and tax burden. (Administration)

615. State School Administration. (2-0). Credit 2. II, S

A study of state school administrative organizations; origin and development of local units; proper relationships of the State to local units; state boards of education and their functioning; training and certification of teachers. (Administration)

616. Administration of Teacher Personnel. (2-0). Credit 2. II, S

A study of selection, salary schedules, tenure, and promotion of teachers, including in-service training; efficiency records and ratings. (Administration)

619. Resources Use Education. (4-0). Credit 4. S

Major emphasis will be given to wise use and protection of our natural and human resources. Consultants will give the technical information concerning each area, and the students will translate this information into teaching units of work for use in public school curriculum. The areas to be considered are soils, water, forests, wildlife, minerals and industry, human resources, health, and physical and safety education. Prerequisite: Education 321 or 431 or the equivalent.

622. The Junior College. (3-0). Credit 3. II, S

A somewhat systematic canvass of the history, present-day philosophy, and problems of the junior college, supplemented by individual projects. Special emphasis will be placed on the organization and administration of junior colleges under Texas laws.

623. Standardized Tests and Measurements. (3-0). Credit 3. II, S

Use of standardized tests in instruction and guidance. Study of various tests of achievement, aptitude, interest, and personality. Methods of construction, experimental trial, and standardization of published tests. Interpretation of test results. Prerequisite: Education 426.

625. Practicum in Secondary Education. (2-3). Credit 3. I

A course designed for secondary school teachers in which a study is made of current problems of the secondary school. The student, with the advice of the instructor, will select an individual problem from the following areas: planning, including the school survey; curriculum development; life adjustment education; education for out-of-school youths and adults; evaluative criteria; supervision; citizens' committee for the public schools. Prerequisites: Individual approval; teaching experience. (Secondary Education)

626. Practicum in Secondary Education. (2-3). Credit 3. II

This is a continuation of Education 625. The student selects an individual secondary school problem different from the one used for Education 625. (Secondary Education)

627. Practicum in Elementary Education. (2-3). Credit 3. I

A course designed for elementary school teachers in which a study is made of current problems of the elementary school. The student, with the advice of the instructor, will select an individual problem from the following areas: evaluation, a detailed study of testing programs; curriculum development in specific areas; health and safety education; child growth and development; improving teaching techniques; supervision, school and community programs. Prerequisites: Individual approval; teaching experience. (Elementary Education)

628. Practicum in Elementary Education. (2-3). Credit 3. II

This is a continuation of Education 627. The student selects an individual elementary school problem different from the one used for Education 627. (Elementary Education)

630. Secondary School Supervision. (3-0). Credit 3. II

A program for the improvement of instruction in the secondary schools. Special, general, and cooperative programs of supervision will be considered. Each student will be required to develop a supervisory program for a subject or a school. Prerequisite: Education 607 or the equivalent. (Secondary, Supervision.)

685. Problems. Credit 1 to 4 each semester. I, II, S

A directed individual study of a selected problem in the field of education. Prerequisite: Graduate classification in education.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis.

PSYCHOLOGY

207. General Psychology. (3-0). Credit 3. I, II, S

An introductory course dealing with the elementary principles of human behavior. Designed for those students preparing for medicine, law, journalism, or for a major in the social or biological sciences.

301. Educational Psychology. (3-0). Credit 3. I, II, S

The application of psychology to the problems of teaching. The nature and operation of the laws of learning; transfer of training; nature, measurement, and significance of individual difference; conditions that influence efficiency of learning. (Professional Education)

303. Psychology for Technical Students. (3-0). Credit 3. I, II, S

An introductory course emphasizing the applications of general psychology. Designed for students of agriculture, business administration, and engineering. Credit cannot be obtained for both Psychology 207 and 303.

305. Personality Adjustments. (3-0). Credit 3. II, S

Chief mechanisms of personal adjustment, the criteria of normality, abnormal patterns of behavior, the methods of psychotherapy. Prerequisite: One course in psychology, preferably Psychology 207.

307. Child Growth and Development. (3-0). Credit 3. I, S

Growth and development of the normal child from infancy to adolescence with emphasis upon the elementary school years. Prerequisite: Psychology 207 or 303. (Elementary Education)

323. Psychology of Adolescence. (3-0). Credit 3. I, II, S

The psychological problems of the normal teen-age individual, including the consideration of the ways and means of aiding youth to meet these problems constructively. Prerequisite: Psychology 301.

401. Industrial Psychology. (3-0). Credit 3. I, S

Significance of individual differences in industry; instruments and techniques of selecting and placing personnel; motivating, training, and supervising the worker; nature and control of fatigue; psychological aspects of labor relations; morale and attitude measurement; industrial counseling. Prerequisites: Industrial Engineering 401 and 411 or registration therein; or Psychology 207 and a course in statistics; or Psychology 303.

402. Advanced Educational Psychology. (3-0). Credit 3. II, S †

A comprehensive study of the nature of the learner and some of the environmental factors which influence learning and educational adjustment. Principles will be evaluated in relation to school practice and results of psychological research. Prerequisites: Psychology 301; senior classification.

Department of Electrical Engineering

Professor M. C. Hughes,
Professors F. C. Bolton, H. C. Dillingham, L. M. Haupt, Jr., E. W. Markle, N. F. Rode, R. P. Ward; Associate Professors G. D. Hallmark, C. S. Walker*; Assistant Professors E. H. Andrew, Jr., R. D. Chenoweth*, J. S. Denison, A. J. Druce, W. T. Matzen, Jr.; Instructor Charles Ingram, Jr.*

201. Electricity and Magnetism. (3-4). Credit 4. I, II

Lectures, recitations, and problems in electricity and magnetism.

A laboratory investigation of the phenomena studied in the textbook. Prerequisites: Mathematics 104, registration in 209.

208. Direct Current Machinery. (3-3). Credit 4. II, S

A study of the application of the fundamental laws of the electric and the magnetic circuits to the design and operation of direct current motors and generators.

The laboratory work includes practice in the wiring up and the operation of DC generators and motors; the determination of characteristics and the measurement and calculation of losses, efficiencies, and regulation. Prerequisite: Electrical Engineering 201.

305. Electrical Machinery. (3-3). Credit 4. I, II, S

A study of the fundamental principles of dynamos, motors, and transformers of the types commonly used in general engineering practice. The practice is designed to familiarize the general engineering student with the operation and the more important characteristics of both direct and alternating current machines. Prerequisites: Mathematics 210; Physics 204.

307. Electrical Circuits. (3-3). Credit 4. I, II, S

A study of the fundamental principles of direct and alternating current circuits.

The practice includes measurements of the circuit phenomena and practical application of equipment. Prerequisites: Mathematics 210; Physics 204.

308. Electrical Machinery. (3-3). Credit 4. I, II, S

A study of the principal types of electrical machinery, including their operating characteristics, and application.

The practice includes actual operation and testing of the electrical machinery and equipment most commonly used in industry. Prerequisite: Electrical Engineering 307.

315. Alternating Currents. (3-3). Credit 4. I, II

Principles of alternating currents. The steady-state relations of voltage and current in simple circuits containing resistance, self inductance, and capacitance. Power and power factor, polyphase circuits. The practice consists of laboratory studies of the topics mentioned above. Prerequisites: Electrical Engineering 201; Mathematics 210.

316. Electrical Circuit Theory. (3-0). Credit 3. II, S

Transients in direct and alternating current circuits. Non-sinusoidal voltages and currents in single phase and polyphase circuits. Study of circuits that have conductive, electric, and magnetic coupling. Prerequisites: Electrical Engineering 315; Mathematics 307.

318. Field Theory and Electrical Measurements. (2-3). Credit 3. II, S

An introduction into the concepts of electric and magnetic fields. Study of the precision and accuracy of measurements. Studies of the various instruments and methods available for the measurements of resistance, inductance, and capacitance; voltage and current in AC and DC circuits; power, power factor, and phase angle; frequency and wave shape; magnetic flux and iron losses. Prerequisite: Electrical Engineering 315.

320. Electronics. (3-3). Credit 4. II, S

An introduction to the theory of electron tubes and circuits. Thermionic, gaseous, light sensitive, and cathode ray tubes, rectifier and amplifier circuits through class B push pull will be covered. Laboratory includes experiments illustrating the principles covered in the theory section. Prerequisite: Electrical Engineering 315.

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*On leave of absence.

401. Alternating Current Machinery. (3-0). Credit 3. I †

A graphical and mathematical study of alternating current machines, including transformers and synchronous generators and motors. Prerequisites: Electrical Engineering 316, registration in 403; Mathematics 308.

402. Alternating Current Machinery. (3-0). Credit 3. II †

A continuation of the study of synchronous machines; asynchronous machines, polyphase and single phase motors; rectifiers and converters and control equipment. Prerequisites: Electrical Engineering 401, 403; registration in 404.

403. Alternating Current Laboratory. (1-3). Credit 2. I

A laboratory study of the alternating current machines covered in Electrical Engineering 401. Prerequisites: Electrical Engineering 316, 318, registration in 401.

404. Alternating Current Laboratory. (1-3). Credit 2. II †

A continuation of the laboratory study of alternating current machines. Prerequisites: Electrical Engineering 401, 403, registration in 402.

406. Electric Power Distribution and Transmission. (2-2). Credit 3. II †

Lectures and recitations on the transmission and distribution of power by electrical methods including symmetrical components. Detailed calculations of line constants, lightning phenomena, switching surges, and cost estimates of transmission and distribution systems. Prerequisite: Electrical Engineering 415.

415. Transmission Networks. (3-0). Credit 3. I †

An analytical study of the theory of transmission lines and impedance matching devices. Hyperbolic functions and differential equations are applied. The treatment is generalized to apply to either power or communication circuits. Prerequisites: Electrical Engineering 316; Mathematics 308.

419. Radio Communication. (3-3). Credit 4. I †

A study of the basic circuits used in radio transmitting and receiving devices. An analytical study of modulators, demodulators, oscillators, and amplifiers. The laboratory work covers experimental studies of the component parts, complete receivers and transmitters. Prerequisites: Electrical Engineering 316, 320; Mathematics 308.

420. Servomechanisms. (3-0). Credit 3. I

A general study of closed-loop control devices, including electrical, hydraulic, and mechanical systems. Prerequisites: Electrical Engineering 307 or 316; Mathematics 308.

428. Communication Circuits. (2-3). Credit 3. I †

A study of the engineering principles used in wire line communications, including telephone and telegraph systems, transmission theory, inductive interference, networks, filters, loading, repeater and carrier systems. Laboratory investigations include transmission measurements on artificial lines involving the use of vacuum tube measuring devices and impedance bridges. Prerequisite: Electrical Engineering 415 or registration therein.

432. Public Utility Problems. (3-0). Credit 3. II

Problems in the mathematics of finance, depreciation, engineering economy, accounting, distribution factors, and rates with particular reference to the electric power industry. Prerequisite: Electrical Engineering 401.

436. Electrical Equipment for Buildings. (3-0). Credit 3. I, II

The application of electrical equipment in building construction including a study of electrical material and method of installation; principles of electrical circuit design and wiring system commonly employed; electrical machinery; elevators; illumination both for interior lighting and floodlighting; and electrical acoustical aids.

441. Symmetrical Components of Polyphase Circuits. (3-0). Credit 3. II †

The solution of current, voltages, and power flow during fault conditions on a power transmission system by the application of a method of symmetrical components. Prerequisite: Electrical Engineering 308 or 401.

446. Television. (2-3). Credit 3. II †

An introduction to the principles and practice of television engineering; image analysis, television camera action, synchronizing circuits, video amplifiers, receivers, laboratory study of transmitters and receivers. Prerequisite: Electrical Engineering 419.

449. Seminar. (0-2). Credit 1. I

Written reports and oral presentation of them on selected topics from current literature in the various fields of electrical engineering. Prerequisite: Senior classification.

450. Seminar. (0-2). Credit 1. II

Oral presentation of selected topics from current literature of the field. Technical films showing practical application of theories of electrical engineering. Prerequisite: Second semester senior classification.

501. Theory and Application of Electron Tubes. (3-3). Credit 4. I, S †

This course is designed to familiarize the students of all engineering fields with basic electron tube phenomena and their applications to electrical instrumentation, particularly strain gauges, amplifiers, cathode ray oscilloscopes, electronic recorders, nuclear counters, pulse forming devices, oscillators, and associated equipment in the electrical field of measurements.

502. Ultra High Frequency Techniques. (2-3). Credit 3. II †

An introduction to the theory and practice of ultra high frequency radio wave generation, transmission and radiation.Development of Maxwell's equations and their application to transmission of electrical energy in wave guides. Prerequisites: Electrical Engineering 415, 419.

503. Radiation and Propagation. (3-0). Credit 3. I †

Electromagnetic waves, current and voltage distribution in antennas, electromagnetic radiation, field distribution, directional antennas, propagation of electric waves; ionosphere, ground wave, sky wave, direct wave, fading characteristics. Prerequisites: Electrical Engineering 415 or registration therein; Mathematics 308.

FOR GRADUATES

601.* Advanced Alternating Currents. (3-4). Credit 4. I

Wave analysis; mechanical and electrical wave analyzers; non-linear circuits; multiple winding transformer theory; transient solution of general network. The study of transients with oscillographs.

602.* Advanced Alternating Currents. (3-4). Credit 4. II

Steady-state and transient solution of recurrent networks, operational calculus methods of solution of circuits with lumped and distributed constants, non-linear circuits.

603.* Electrical Machine Design. (1-3). Credit 2. I

The design of electrical machines and the predetermination of their characteristics.

604. Electrical Plant Design. (1-3). Credit 2. II

The design of power plants with special emphasis on the electrical machinery.

605. Servomechanisms. (4-0). Credit 4. I

A study of the theory of feed back control systems with special emphasis on the synthesis of such systems. Includes the transient and steady-state behavior of electrical, mechanical, and hydraulic systems. Prerequisites: Mathematics 308; graduate classification.

606. Servomechanisms. (3-3). Credit 4. II

A study of feed back control system components and their power requirements; and sample data, on-off, and other discontinous control systems. Prerequisite: Electrical Engineering 605.

607.* Alternating Current Circuits and Machines. (3-4). Credit 4. I

The study of transient conditions in electrical machines.

608.* Advanced Alternating Current Macinery. (3-4). Credit 4. II

A study of complicated alternating current machines.

609.* Advanced Communication Engineering—Audio Systems. (3-3) Credit 4. I

A study of the design and operation of audio systems, including mixers, amplifiers, equalizers, filters, networks, and transmission measuring devices; laboratory investigations include frequency characteristics of lines, transmission measurements on typical networks, and audio amplifiers.

*In the summer session these courses may be divided into two parts, a and b, each with two hours of credit.

610.* Advanced Communication Engineering—Broadcast Systems. (3-3). Credit 4. II

A detailed study of the design and operation of radio frequency receiving and transmitting systems for broadcasting. Field strength measurements and determination of the characteristics of broadcast equipment are the major laboratory investigations.

611.* Symmetrical Components Applied to Electrical Engineering. (3-4). Credit 4. II

The solution of unbalanced electrical circuits by means of symmetrical components; the study and measurement of machine constants by means of the oscillograph.

612. Application of Electrical Machinery to Industrial Operations. (4-0). Credit 4. I

A study of characteristics of electrical motors with special emphasis on their application to different types of loading, electrical control, and the development of electrically operated drives.

613. Public Utility Administration. (4-0). Credit 4. I

A study of the development of public service regulation by commissions; status of public service corporations in the courts; the fixing of rate bases and analyses of methods used in determining cost of service, and other problems pertaining to public utility administration.

614. Public Utility Administration. (4-0). Credit 4. II

A continuation of the study of problems pertaining to public utility administration.

616.* Acoustic Devices in Sound Reproducing Systems. (3-3). Credit 4. II

A detailed study of microphones, recorders, and loud speakers with an introduction to the basic theory of vibrating systems; and a brief study of architectural and physiological acoustics incident to the proper application of sound reproducing systems. Laboratory work includes measurements of speakers, recorders, and microphones, noise surveys, and performance of sound systems in small auditoria.

620.* Advanced Illuminating Engineering. (3-3). Credit 4. I

A study of fundamentals of illuminating engineering concepts; advanced design of various types of lighting installations; problems of a research character.

621. High Voltage Phenomena. (2-0). Credit 2. I

A study of dielectrics as applied to insulation of high voltage systems; lightning and lightning protection.

622. High Voltage Laboratory. (0-6). Credit 2. II

Sixty cycle and impulse testing; measurement of impulse voltage and currents with a high voltage cathode ray oscillograph.

626.* Introduction to Electron Tube Design. (4-0). Credit 4. I

The motion of ions in electric and magnetic fields, electron emission, and conduction through gases are studied. The applications in mass spectrometry, electron optics, and electron tube design are considered.

627.* Electron Tube Design. (2-6). Credit 4. II

The theory of design and laboratory techniques applied in the experimental development of electronic tubes.

628. Theory and Design of Feedback Networks. (4-0). Credit 4. I

A study of regeneration and feedback theory with emphasis on circuit analysis methods suitable for treatment of these topics. Prerequisites: Electrical Engineering 601; Mathematics 602 or the equivalent.

631.* Design of Special Electronic Circuits. (3-3). Credit 4. II

A study of the design of special electronic circuits, trigger circuits, multivibrators, counters, sweep circuits, and special control and synchronizing circuits as found in television, radar, and other applications. Prerequisite: Electrical Engineering 419 or registration therein.

685. Problems. Credit 1 to 4 each semester. I, II

Research problems of limited scope designed primarily to develop research technique.

691. Research. Credit 1 or more each semester. I, II

Research for thesis or dissertation.

*In the summer session these courses may be divided into two parts, a and b, each with two hours of credit.

Department of Engineering Drawing

Professor W. E. Street,
Professor J. G. McGuire; Associate Professors W. F. Adams, E. H. Brock, S. M. Cleland, B. F. K. Mullins, J. P. Oliver, C. H. Ransdell, L. E. Stark; Assistant Professors B. A. Hardaway, P. M. Mason; Instructors N. B. Bardell, T. T. Isbell, L. T. McBeth, F. D. Meyers*

105. Engineering Drawing. (0-6). Credit 2. I, II, S

Care and use of drawing instruments and equipment, vertical freehand lettering, engineering, geometry, view drawings, revolutions, auxiliaries, sections, engineering sketching, pictorials. dimensioning, working drawings.

106. Descriptive Geometry. (0-6). Credit 2. I, II, S

Point, line, and plane relationships. Bearings and slopes of lines. Contours, cuts, and fills. Strike and dip. Successive auxiliary view problems. Revolution about an axis and true length diagrams. Developments and intersections. Prerequisite: Engineering Drawing 105.

127. Industrial Freehand Sketching. (1-3). Credit 2. I, II

Basic techniques of freehand drawing in line and tone; delineation of form, textures, materials, sketching, and industrial applications of freehand drawing.

128. Methods of Industrial Reproductions. (0-2). Credit 1. II

Basic techniques of reproduction processes for industrial use.

207. Lay-Off and Mold Loft Drafting. (0-3). Credit 1. I

Practical application of descriptive geometry in lay-off problems from the mold loft. Faired lines from offsets. Intersections of faired lines by planes, and intersections of shell and fittings. Prerequisite: Engineering Drawing 106. May be taken concurrently with 208.

208. Lay-Off and Mold Loft Drafting. (0-3). Credit 1. II

Practical application of descriptive geometry in lay-off problems from the mold loft. Faired lines from offsets. Intersections of faired lines by planes, and intersections of shell and fittings. Prerequisite: Engineering Drawing 106. May be taken concurrently with 207.

221. Building Construction Drawing. (1-3). Credit 2. I

Architectural details in frame and masonry construction; general drawings and techniques of presentation. (For students in industrial education) Prerequisite: Engineering Drawing 105 or the equivalent.

222. Building Construction Drawing. (1-3). Credit 2. II

Architectural details in various types of construction; working drawings and techniques of presentation. (For students in industrial education) Prerequisite: Engineering Drawing 221.

302. Nomography. (1-3). Credit 2. II

Introduction; uniform and functional scales; types of equations; the alignment chart; Z-charts; combinations. Prerequisite: Mathematics 210.

FOR GRADUATES

601. Advanced Industrial Drawing. (2-3). Credit 3. I, S

Problems pertinent to all industrial fields. Solutions involve projections, primary auxiliary views, successive auxiliary views, revolutions, flat pattern layouts, perspective, and shades and shadows. Use of drafting machines and other special drafting equipment. Appropriate for high school and college teachers. Prerequisite: Engineering Drawing 106 or equivalent.

*On leave of absence.

603. Advanced Machine Drawing. (1-6). Credit 3. II, S

Conventional practices, dimensioning, fastenings, machine and pictorial sketching. Empirical design including problems of stuffing boxes, piping, shafting, gears, cams, ship and aircraft parts. Use of special drafting equipment such as drafting machine, section liner, proportional dividers, erasing machines, light table, and mechanical lettering guides. Methods of reproduction. Appropriate for high school and college teachers. Prerequisite: Engineering Drawing 106 or equivalent.

605. Spherical Projections.* (2-0). Credit 2. I, S

Advanced graphics including recent developments in drawing, review of graphical research, and related fields. Prerequisite: Engineering Drawing 106 or the equivalent.

606. Stereographic and Clinographic Projections.* (2-0). Credit 2. II, S

Advanced graphics including recent developments in drawing, review of graphical research, and related fields. Prerequisite: Engineering Drawing 106 or the equivalent.

607. Descriptive Geometry for Teachers.* (4-0). Credit 4. II, S

Fundamental concepts of descriptive geometry. The design and organization of problems and teaching devices for college teachers. Prerequisite: Engineering Drawing 106 or the equivalent.

611. Technical Illustration.* (3-3). Credit 4. I, S

Axonometric projection including shading. Design and construction of display layouts. Commercial and technical illustrating. Prerequisite: Engineering Drawing 106 or the equivalent.

Department of English

Professor S. S. Morgan,
Professors D. B. Cofer, F. E. Ekfelt, P. G. Gunter, J. Q. Hays, E. D. Hedgcock, T. F. Mayo; Associate Professors K. E. Elmquist, C. A. Greer, P. C. Key, H. L. Kidd, C. D. Laverty; Assistant Professors S. S. Cox, H. S. Creswell, C. K. Esten, L. F. Hauer, H. E. Hierth**, M. A. Huggett, L. B. Keel, L. J. Martin, J. F. Pierce, F. W. Powell, N. W. Quick, J. N. Shepperd, S. B. Southwell, E. E. Stokes; Instructors J. Q. Anderson, D. C. Baker, J. D. Ebbs, H. G. Eldridge**, R. W. Feragen, W. A. Ferrel, J. S. Jernigan, G. G. Lake, J. J. Lawler, W. B. Martin, T. J. Mattern, M. A. Rodgers, R. J. Salisbury, V. Weining, D. E. Wretlind, E. C. York**

100. Fundamentals of Writing. (3-0). Credit 3. I, II, S

Emphasis on spelling, punctuation, grammatical correctness, clearness, and naturalness. For students at all levels who are deficient in English. **No credit toward a degree will be granted for the satisfactory completion of this course.**

103. Composition and Rhetoric. (3-0). Credit 3. I, II, S

Composition oral and written. Readings in modern prose (not fiction). Emphasis on grammar and the structure of the sentence and the paragraph.

104. Composition and Rhetoric. (3-0). Credit 3. I, II, S

Composition oral and written. A continuation of the study in English 103. Emphasis on the short composition and the writing of investigative papers.

203. Composition and Literature. (2-0). Credit 2. I, II, S

Advanced composition, based upon the reading and discussion of modern plays, stories, and novels, and the critical analysis of one or two current moving pictures. Prerequisites: English 103, 104.

207. Report Writing and Correspondence. (2-0). Credit 2. I, II

A course in the preparation of technical reports and of the more common types of business letters. Prerequisites: English 103, 104.

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*Primarily for graduate students interested in education. Not available for major or minor work toward an engineering degree except by permission of the Dean of the Graduate School.

**On leave of absence.

210. Writing and Discussion. (2-0). Credit 2. I, II, S

A study of the principles of reasoning as these apply to all types of composition intended to influence thought and conduct; reading practice in evaluating evidence, inference, and strategy of presentation; writing and speaking practice in the analysis and support of a proposition. Prerequisites: English 103, 104.

212. Shakespeare. (3-0). Credit 3. I, II, S

A study of the major plays of Shakespeare, with lectures on his life, his language, and his cultural environment. Prerequisites: English 103, 104.

231. Survey of English Literature. (3-0). Credit 3. I, II, S

A survey of the literature of England from Anglo-Saxon times to Dr. Johnson. Emphasis on reading in such major writers as Chaucer, Spenser, Shakespeare, Donne, Jonson, Milton, Dryden, Pope, Addison and Steele, Swift, Goldsmith, and Johnson. Special attention to the Shakespeare of the sonnets. Includes both poetry and prose, and both drama and fiction. Prerequisites: English 103, 104.

232. Survey of English Literature. (3-0). Credit 3. II, S

A survey of the literature of England as reflected in the poems of Thomson through the last Victorians, in the essays of Lamb through Huxley, and in the novels of Scott through Hardy, with special attention to reports and discussions on the main current of English thought on revolution, reform, democracy, religion, science, and industrialism. Prerequisites: English 103, 104.

301. Writing for Professional Men. (3-0). Credit 3. I, II, S

Advanced writing in scientific and technical fields including technical reports and papers designed for technical and scientific journals; business correspondence. Prerequisite: The completion of the freshman-sophomore program of English.

309. The English Language. (3-0). Credit 3. I

Survey of the grammatical structure, vocabulary, and history of the English language, with brief discussion of related languages. Examples of the study of literature and writing from the standpoint of language. Prerequisites: Two courses in sophomore English. (Offered in 1955-56 and in alternate years thereafter.)

310. Phonetics and Pronunciation. (3-0). Credit 3. II

Brief introductory discussion of the nature of language and of language study. Detailed study of the formation of English sounds, of usage in pronunciation, and of phonetic and phonemic principles. Prerequisites: Two courses in sophomore English. (Offered in 1954-55 and in alternate years thereafter.)

319. Report Writing. (1-0). Credit 1. I

A course in the preparation of technical reports in the form observed by the Petroleum Division of the A. I. M. E., the American Petroleum Institute, and the American Association of Geologists, with instruction in the preparation of bibliographies and the use of library material. Prerequisite: English 104.

320. Selected Reading. (1-0). Credit 1. I, II

The careful, reflective reading, with lectures and class discussions, of four selected books which are both enjoyable and thought-provoking. The objects of the course are both to acquaint students intimately with these books and to teach them to read good literature with understanding and pleasure. Prerequisite: One course in sophomore English.

321. Nineteenth Century Literature (Romantic). (3-0). Credit 3. I

A study of the intellectual tendencies of the nineteenth century as reflected in the poetry of Wordsworth, Coleridge, Byron, Shelley, Keats, and others. Prerequisite: Two courses in sophomore English.

322. Nineteenth Century Literature (Victorian). (3-0). Credit 3. II

A continuation of the study in nineteenth century thought as reflected in the writings of Tennyson, Browning, Arnold, and other Victorians. Prerequisites: Two courses in sophomore English.

325. Creative Writing. (2-0). Credit 2. I

The writing of stories, one-act plays, essays, editorials, and feature articles, especially intended to aid the students in their extracurricular writing. Limited to students who have made an average of C in the prerequisite courses. Prerequisites: Two courses in sophomore English. (Offered in 1954-55 and in alternate years thereafter.)

327. American Literature to 1870. (2-0). Credit 2. I †

A study of American literature from the Colonial Period through the Civil War, with attention to the intellectual and social movements reflected in that literature. Special emphasis is placed upon the evolution of the democratic ideal as it is pictured in American literature. Prerequisites: Two courses in sophomore English.

328. American Literature from 1870 to 1920. (2-0). Credit 2. II †

A study of American writing from Whitman and Twain to Frost and Dreiser; chief emphasis on major writers; incidental attention to social and literary movements. Limited to students who have made an average of C or better in the prerequisite courses. Prerequisites: Two courses in sophomore English.

334. Science in Literature. (3-0). Credit 3. II

Science in literature will trace the main developments in the history of science as they are presented in the literature of the Western World. The course will show the way in which science has influenced the literature productions of important writers, especially in English and American literature. Prerequisites: Two courses in sophomore English. (Offered in 1954-55 and in alternate years thereafter.)

336. Life and Literature of the Southwest. (3-0). Credit 3. II

A study of the culture of the Southwest as expressed in literature, with emphasis on its different strains and their interweaving. Prerequisites: Freshman English and one course in sophomore English. (Offered in 1955-56 and in alternate years thereafter.)

340. Modern Drama. (3-0). Credit 3. II, S †

A study of representative plays (in translation) by such dramatists as Ibsen, Hauptmann, Rostand, and Pirandello on the Continent, and Pinero, Shaw, Synge, O'Neill, and Maxwell Anderson in England and America. Prerequisites: Two courses in sophomore English.

350. Modern Literature. (3-0). Credit 3. I †

A study of the most interesting British and American novelists, poets, and dramatists from about 1920 to the present, with lectures on the social and intellectual background. Among the authors studied are Galsworthy, Aldous Huxley, Lewis, Wolfe, Hemingway, Steinbeck, O'Neill, Eliot, Millay, and Jeffers. Prerequisites: Two courses in sophomore English. (Offered in 1955-56 and in alternate years thereafter.)

371. Great Books. (3-0). Credit 3. I, II, S

Greek plays, Roman lives (from Plutarch), Dante's Inferno, Shakespeare's King Lear, a Russian novel, twenty English poems, a modern novel. Prerequisite: Completion of the freshman-sophomore program in English; for students majoring in architecture, English 210.

375. Great American Writers. (2-0). Credit 2. II

The most important works of five or six distinguished American writers of the nineteenth and twentieth centuries. (The list will vary but will be chosen from such writers as Emerson, Melville, Whitman, Twain, James, Glasgow, and Frost.) Prerequisite: One course in sophomore English.

381. Play Production. (2-3). Credit 3. I

An effort to obtain an understanding of play production by a study of important aspects of social drama, Shakespeare, and special problems in college and community theaters. Students will study selected plays from the Greek drama through the Restoration period and adapt portions of them for presentation on a weekly radio program. Students will also participate in the presentation of two plays each semester. Prerequisite: Completion of freshman-sophomore program in English. (Offered in 1954-55 and in alternate years thereafter.)

382. Stagecraft. (2-0). Credit 2. II

A study of the methods of staging plays, including scene design, scene construction, stage lighting, etc. Students will design sets to interpret mood and idea of plays; draft floor plans drawn to scale, make sketch and water color of set, and construct model set. Students will participate in the staging of two plays each semester. Readings will cover the history of the theater from the time of the Greeks until today. Prerequisite: Completion of freshman-sophomore program in English. (Offered in 1955-56 and in alternate years thereafter.)

401. Public Speaking. (0-2). Credit 1. I, II, S

Practice in the use of the voice, in the planning and delivery of speeches, in parliamentary procedure, and in group discussion. Prerequisite: Completion of the freshman-sophomore program in English.

403. Speaking for Professional Men. (1-2). Credit 2. I, II, S

Speech training for technical students in their professional fields. Topics include: how the professions serve society; how the professions have helped shape the course of society; technical reports; group discussions. Prerequisite: Completion of freshman-sophomore program in English.

405. Radio Speaking and Studio Practice. (2-0). Credit 2. I

Training in the preparation and delivery of radio talks, interviews, discussions, and announcements. Elementary principles of script and writing, practice in WTAW studio. Prerequisites: Two courses in sophomore English; approval of the instructor. (Offered in 1955-56 and in alternate years thereafter.)

407. Speaking and Oral Interpretation. (1-2). Credit 2. II

Speech training with special attention to the student's professional field. The course will also include instruction and practice in the oral interpretation of literature, both prose and poetry. Required of English majors and education majors with a teaching major in English. Students may not receive credit for both English 403 and 407. Prerequisite: Completion of freshman-sophomore program in English. (Offered in 1954-55 and in alternate years thereafter.)

428. The Novel in English. (3-0). Credit 3. I

A study of the novel in English in the eighteenth, nineteenth, and early twentieth centuries. Lectures; readings in the works of representative novelists such as Fielding, Austen, Scott, Dickens, Thackeray, Eliot, Hardy, Conrad, Galsworthy, Woolf, Forster, Melville, James, Dreiser. Prerequisites: Two courses in sophomore English. (Offered in 1954-55 and in alternate years thereafter.)

461. Teaching of Language and Composition. (3-0). Credit 3. S †

A study of administrative and teaching problems involved in high school and college courses in composition. The organization and presentation of courses designed to improve student writing; various points of view toward language study held by teachers and students of linguistics; papers written by students and graded and criticized by instructor; supervised practice in grading and criticizing of student writing; the organizing of the curriculum in English from the grades to college. The course is intended for students expecting to teach English, for teachers of other subjects, and for principals and superintendents confronted with problems of organizing and administering the English program. Prerequisite: Senior classification or approval of instructor.

485. Problems. Credit 1 to 3. I, II, S

Individual supervision; no class meetings. Readings designed for the student with a major or a minor in English and selected to round out his over-all knowledge of literature and the criticism of literature. The selection of books will be determined for each student separately, and the student will read each book under the supervision of a professor in the Department of English who is a specialist in the field embracing the book. There will be written reports on the readings and a semester examination. Prerequisites: Eighteen hours of English.

Department of Entomology

Professor J. C. Gaines,
Professors V. A. Little, H. J. Reinhard, F. L. Thomas; Associate Professor D. F. Martin; Assistant Professors R. L. Hanna, D. R. King, M. A. Price

201. General Entomology. (2-2). Credit 3. I, II, S

A study of the principal orders of insects; the relation of anatomy and physiology of insects to control methods; the principal insecticides and their uses; the development, habits, and economic importance of the more common insects with control methods for the injurious species.

208. Veterinary Entomology. (3-2). Credit 4. II

A study of insects and other arthropods that are parasitic upon domestic animals or concerned in the transmission of diseases. Methods of eradication and control are emphasized. Prerequisite: First year classification in veterinary medicine.

301. Systematic Entomology. (2-3). Credit 3. I †

A systematic study of the orders and families of insects, their distinguishing characteristics, and the habitat and feeding habits of representative species. The preparation of insect collection and the use of keys for identification are emphasized in practice. Prerequisite: Entomology 201 or equivalent.

302. Systematic Entomology. (2-3). Credit 3. II †

A continuation of Entomology 301, including orders and families of insects not included in Entomology 301. Prerequisite: Entomology 301.

305. Insect Morphology. (2-3). Credit 3. I †

General morphology of typical insects with special emphasis on those structures of particular importance in systematic and applied entomology. Prerequisite: Entomology 201 or equivalent.

306. Insect Physiology. (2-3). Credit 3. II †

Internal anatomy and principles of physiology as applied to insects. Prerequisite: Entomology 305.

307. Principles of Beekeeping. (2-2). Credit 3. I

The life history of the honey bee, swarm control, division of colonies, feeding, wintering, and general apiary management.

308. Bees and Pollination. (2-2). Credit 3. II

The course is designed to familiarize the students in agronomy, horticulture, agricultural education, and others with honey production, queen and package bee production, and the pollination of various crops for maximum seed production.

309. Livestock Pests. (2-3). Credit 3. I

Field identification, biology, and control of insects, ticks, and mites found on domestic animals. Control measures will be emphasized. Relations of arthropods to diseases considered briefly. Prerequisite: Entomology 201 or the equivalent.

312. Medical Entomology. (3-2). Credit 4. II

A study of insects and other arthropods that are the causative agents of human diseases, or that are vectors, or intermediate hosts of disease-producing organisms. Prerequisite: Biology 105 or Entomology 201.

313. Biology of Insects. (2-3). Credit 3. I

General biology and taxonomy of the classes of Arthropoda. Emphasis is placed on the orders and more important families of Hexapoda, their marks of identification, general biology, and their relations to other animals. The use of keys for the identification of insects and other arthropods is stressed in the laboratory. Prerequisite: Six hours of biological sciences.

401. Principles of Insect Control. (2-3). Credit 3. I †

A study of both applied and natural controls emphasizing the uses, practical application, the physical and chemical properties of the more important insecticides. Prerequisite: Entomology 201.

402. Agricultural Pests. (2-3). Credit 3. II †

The biological development, habits, and control of insect pests attacking farm crops, including livestock. Prerequisite: Entomology 201.

405. Fruit and Vegetable Insects. (2-2). Credit 3. II

The biological development, habits, and control of insect pests attacking fruit and truck crops, with special emphasis on the value of parasites and orchard management for control. Prerequisite: Entomology 201 or equivalent.

418. Problems. Credit 1 to 4. I, II, S

Individual problems for beginners in research. Prerequisite: Entomology 302.

421. Seminar. (1-0). Credit 1. I, II

Report of original investigations, current literature, and special features. Required for entomology seniors and graduate students each semester.

423. Comparative Anatomy of Arthropods. (2-3). Credit 3. I

A detailed comparison of the digestion, respiration, circulation, excretion, and nervous system of arthropods and related animals. Taxonomic characters are also stressed. Prerequisite: Entomology 305 or equivalent.

424. Insect Ecology. (2-3). Credit 3. II

The effect of environmental factors upon the distribution, abundance, competition, and ecological succession of insects. Prerequisite: Entomology 302 or equivalent.

FOR GRADUATES

601, 602. Systematic Entomology. (3-3). Credit 4 each semester. I, II

A taxonomic study of the orders, families, and sub-groups of the class Hexapoda; a study of the International Rules of Nomenclature. A special study of some particular group of insects is required in practice. Prerequisite: Entomology 302.

605, 606. Apiculture. (3-3). Credit 4 each semester. I, II

Apiary management; grading and marketing honey; diseases affecting bees; American foulbrood regulations, and methods of eradicating bee diseases. Prerequisite: Entomology 308.

607. Economic Entomology. (3-3). Credit 4. I, S

This course is designed chiefly for workers in vocational agriculture and the Extension Service. It includes studies of agricultural pests, their biologies, damage as determined by making infestation records and the use of control measures. Insecticides and methods of application are also considered. Prerequisite: Approval of Head of Department.

608. Economic Entomology. (3-3). Credit 4. II

A detailed study of insect pests, including identification, distribution, principles and methods of natural, cultural, and chemical controls; literature and research methods. Prerequisite: Entomology 401 or 402.

613, 614. Morphology. (3-3). Credit 4 each semester. I, II

A detailed study of anatomical structures of insects. Prerequisite: Entomology 305.

615. Insect Physiology. (3-3). Credit 4. I

A study of the mechanical and chemical senses of insects; the physiology of respiration, circulation, digestion, and excretion. Prerequisite: Entomology 306.

617, 618. Medical Entomology. (3-3). Credit 4 each semester. I, II

The taxonomy and biology of parasitic insects, ticks, mites and their role in the causation and transmission of diseases affecting man and domestic animals. Prerequisites: Entomology 208, 312 or equivalent.

619. Insect Toxicology. (3-3). Credit 4. II

Chemical compounds which possess toxic properties; actions of poisons on insects; evaluation of insecticides in the laboratory and field; and mathematical analysis of data. Prerequisite: Entomology 615.

623. Aquatic Arthropods. (3-3). Credit 4. I

A detailed study of the taxonomy, life history, and ecology of crustacea and aquatic insects, and their relation to fish production. Literature and research methods are included. Prerequisite: Entomology 313 or the equivalent.

685. Problems. Credit 1 to 4 each semester. I, II, S

Individual problems or research not pertaining to a thesis or dissertation. Prerequisites: Graduate classification with major or minor in entomology; approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II, S

Research problems on taxonomy, life histories, biological control, ecology, physiology, or toxicology of insecticides. Prerequisite: Graduate classification.

Department of Floriculture and Landscape Architecture

Professor A. F. DeWerth;
Associate Professor R. F. White; Assistant Professor L. J. Tolle, Jr.;
Instructor J. W. MacQueen

FLORICULTURE

120. Ornamental Plant Production. (2-2). Credit 3. I

Status of industry, classification and distribution of ornamental crops, importance of good varieties, crop improvement, principles and practices of ornamental plant production. Prerequisite: Biology 101.

220. Propagation of Ornamental Plants. (2-2). Credit 3. II

A study of the principles and practices of the propagation of ornamental plants. The course is designed to acquaint the student with the commercial methods followed in the propagation of florists' crops and woody ornamentals. The reproduction of these plants by seeds, cuttings, grafting, layers, runners, separation and division is considered.

222. Greenhouse Construction and Management. (2-2). Credit 3. I

The course is designed to familiarize the student with the fundamentals and practices involved in the construction and management of greenhouses and other forcing structures normally employed in the production of commercial florists' crops and ornamental nursery stock.

320. Garden Management. (2-2). Credit 3. II

A course designed to study the identification, culture, and uses of outdoor herbaceous ornamental crops and garden roses.

321. Commercial Florists' Crops. (2-2). Credit 3. I

The production, harvesting, grading, and marketing of florists' crops. Field trips to commercial establishments. Prerequisite: Floriculture 120.

323. Nursery Management. (2-2). Credit 3. II

Management of the modern nursery specializing in ornamental plants. The status of the industry, its development in general, production, merchandising, and handling of nursery products in all phases. Field trips to commercial nurseries. Prerequisite: Floriculture 220. (Offered in 1954-55 and in alternate years thereafter.)

421. Marketing of Ornamental Plants. (3-3). Credit 4. I †

The application of market techniques to the sale of cut flowers, pot plants, and nursery stock will be considered. Attention will be given to the preparation of crops for market, to grading, packing and shipping, and selling direct and through commission houses. Emphasis will be placed on the study of markets and the elimination of periodic gluts. Several inspection trips will be made. (Offered in 1955-56 and in alternate years thereafter.)

422. Outdoor Production Methods. (3-3). Credit 4. II †

A study of the methods used in growing bulb crops, cut flowers, and ornamental nursery stock and landscape plants in the open field under Texas conditions. Cultural aspects of the nursery and florist industries in Texas will be stressed. Several field trips will be required. (Offered in 1955-56 and in alternate years thereafter.)

426. Flower Store Management. (2-3). Credit 3. II

Management of the retail flower shop together with the principles and practices of flower designing are the essential parts of the course. Prerequisite: Economics 205. (Offered in 1954-55 and in alternate years thereafter.)

427. Seminar. (1-0). Credit 1 each semester. II

Review of current experimental work in the field of ornamental plants and landscape development. Presented by staff members, graduate and senior students. Required of all graduate and senior students in the Department and restricted to these students.

FOR GRADUATES

605. Techniques of Floriculture. (2-0). Credit 2. I

A critical survey of the literature and problems of floriculture and ornamental horticulture. Prerequisites: Plant Physiology and Pathology 301, 313; approval of Head of Department. (Offered in 1955-56 and in alternate years thereafter.)

607. Propagation of Ornamental Plants. (1-6). Credit 3. I

This course is devoted to an intensive and detailed physiological, anatomical, and practical study of the principles and practices of plant propagation. Prerequisites: Floriculture 220, 321, and Landscape Architecture 403, or their equivalent in Horticulture; approval of Head of Department. (Offered in 1955-56 and in alternate years thereafter.)

609, 610. Experimental Floriculture. (1-6). Credit 3 each semester. I, II

Studies on the effect of environmental factors upon the growth of flowering plants. Emphasis is placed on the examination of the plants themselves. Particular attention given to the relation between the environment and practical problems in the greenhouse. Among subjects considered are: Soilless culture, nitrogen, phosphorus, potassium, calcium, and magnesium deficiencies, and water relations in greenhouse plants. The effect of various treatments on flowering greenhouse crops. (Offered in 1954-55 and in alternate years thereafter.)

685. Problems. Credit 1 to 4 each semester. I, II, S

This course is for students who desire to work out special problems. Students will elect work in their desired subjects after a conference with instructor in charge. Prerequisites: Genetics 301; Plant Physiology and Pathology 301, 313; approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II, S.

Research for thesis or dissertation.

LANDSCAPE ARCHITECTURE

206. Ornamental Plant Materials. (2-2). Credit 3. II

This course is devoted to a detailed study of trees, shrubs, and vines; their identification, adaptation to environment, uses, and management in landscape plantings. Prerequisite: Biology 101.

300. Summer Practice. Ten weeks, required. No credit. S

Approved summer practice with a recognized landscape architect or nursery.

301. Intermediate Landscape Design. (1-15). Credit 6. I

A first course in landscape design. Arranged to give a general knowledge of the various problems met in the practice of landscape design, including private, semi-public, and public areas. Prerequisites: Architecture 202; Landscape Architecture 206. (Offered in 1954-55 and in alternate years thereafter.)

308. Park and Recreational Development. (2-0). Credit 2. II

A study of the history, location, administration, and maintenance of public parks, and present trends in the field of recreation as it pertains to these areas.

310. History of Landscape Architecture. (3-0). Credit 3. I

A study of the development of the art of landscape design from the earliest efforts to the present day. Illustrated lectures, collateral readings, and reports. (Offered in 1954-55 and in alternate years thereafter.)

411. Landscape Design for the Architect and Engineer. (2-2).

A second course in landscape design. Arranged to give a general knowledge of the various problems met in the practice of landscape design including private, semi-public, and public areas. Prerequisite: Landscape Architecture 301. (Offered in 1954-55 and in alternate years thereafter.)

312. Landscape Construction. (2-3). Credit 3. II

Treatment of various phases of work included in a landscape development. Finish grading, drainage, and preparation of detailed drawings. Field practice in construction phases. Prerequisite: Landscape Architecture 206. (Offered in 1954-55 and in alternate years thereafter.)

401. Advanced Landscape Design. (1-15). Credit 6. I

Major landscape design problems and their respective land use application. Private estates, parks, subdivisions, and other private and public areas. Prerequisite: Landscape Architecture 206. (Offered in 1955-56 and in alternate years thereafter.)

402. Advanced Landscape Design. (1-15). Credit 6. II

A continuation of Landscape Architecture 401 and fundamentals of city and regional planning. Prerequisite: Landscape Architecture 401. (Offered in 1955-56 and in alternate years thereafter.)

403. Advanced Ornamental Plants and Planting. (2-2). Credit 3. I

A study of ornamental plants and planting operations. Contracts and landscape specifications. Landscape estimating and maintenance. Prerequisite: Landscape Architecture 206.

406. Planting Design. (2-3). Credit 3. I

A study of mass, form, and texture of plant material in relation to one another as well as to structures and site development. Prerequisite: Landscape Architecture 206. (Offered in 1955-56 and in alternate years thereafter.)

411. Landscape Design for the Architect and Engineer. (2-2). Credit 3. I, II

Designed to present the principles of, and technical requirements involved in, the landscape development of residential, industrial, and other outdoor areas. Special emphasis is placed on the relationship of the architectural and engineering professions to such developments. Not open to students majoring in landscape architecture.

Department of Genetics

Professor C. B. Godbey,
Professor R. G. Reeves; Associate Professors H. H. Hadley, R. R. Shrode; Assistant Professor M. J. Garber

301. Genetics. (3-2). Credit 4. I, II, S †

Fundamental principles of genetics: heredity, variation, the physical basis of inheritance, the chromosome theory of inheritance, the expression and interaction of genes, linkage, sex and its inheritance. Introduction to biometrical methods. Laboratory work with Drosophila. Prerequisite: Biology 101 or 107.

304. Plant Breeding. (3-2). Credit 4. II †

The improvement of crops by hybridization and selection. Special breeding methods and techniques applicable to naturally self-pollinated, cross-pollinated, and asexually reproduced plants. Prerequisite: Genetics 301.

306. Animal Breeding. (2-2). Credit 3. I, II †

Genetics as applied to the problems of the animal breeder. Genetic and phenotypic effects of selection. Comparison of various selection methods such as mass selection, family selection, progeny and sib testing. Selection indexes. Systems of mating such as grading, cross-breeding, inbreeding, linebreeding, outbreeding, and random mating. Genetic analysis of pedigrees. Prerequisite: Genetics 301.

406. Biometry—Experimental Technique. (2-3). Credit 3. I, II, S †

The purpose of this course is to acquaint the student with the common methods of analyzing biological data. The planning, analyzing, and interpreting of experiments in plant and animal sciences. A study of measures of type, variability, linear relationship, significance of means, reliability, goodness of fit, analysis of variance.

Poultry Husbandry 414. Poultry Breeding. (2-2). Credit 3. I †

See page 362 for a full description of this course.

FOR GRADUATES

603. Genetics. (3-0). Credit 3. I

General laws involved in heredity and variations with emphasis on the effects produced by deviations from these laws. Theories on the function, manner of action, time of action, and nature of the gene. Students not majoring in genetics may receive credit for Genetics 603 without taking Genetics 604; students majoring in genetics are required to take Genetics 604 simultaneously with Genetics 603. Prerequisites: Genetics 301; approval of the instructor.

604. Genetics Laboratory. (0-3). Credit 1. I

Inheritance studies principally with Drosophila including analysis of data, laboratory techniques and methods.

605, 606. Biometry. (3-3). Credit 4 each semester. I, II

A study of the elementary statistics; Chi square; design of simple experiments; analysis of variance, covariance; design and analysis of complex experiments. This course is designed to meet the needs of students majoring in either plant or animal science.

612. Plant Genetics. (3-3). Credit 4. II

Specialized study of plant genetics. Sources and methods of isolating heritable variation. Polygenic systems in relation to breeding. Advances in breeding techniques; types of selection. Prerequisites: Genetics 304, 603.

616. Animal Genetics. (3-3). Credit 4. II

Specialized study of animal genetics. Population genetics especially as related to breed improvement. Causes of change in gene frequency. Effectiveness of various methods of selection under various genetic circumstances. Analysis of genetic problems. Systems of mating. Standard textbooks and current scientific literature used. Prerequisites: Genetics 306, 406, 603.

620. Cytogenetics. (3-3). Credit 4. II

A study of genetics by cytological methods. Prerequisites: Biology 615; Genetics 301.

623. Special Topics in Genetics. Credit 2 to 4. I

Content of this course will depend upon the interest of the students and the specialty of the instructor. Lecturers who have attained distinction in genetics or related fields will conduct this course.

625. Speciation. (2-0). Credit 2. I

A study of the genetic and environmental forces which operate in species formation together with a critical examination and comparison of the more important current explanations of speciation. Prerequisites: Biology 346; Genetics 603; approval of the instructor.

628. Animal Breeding. (2-0). Credit 2. I

A course designed to acquaint the student with the current status of knowledge in the field of animal breeding through a critical survey of the literature. Emphasis is given papers dealing with problems of breeding for quantitative traits of economic importance in farm animals including beef cattle, dairy cattle, poultry, sheep, and swine. Considerable attention is focused on methods which have been used or are available for use in studying animal breeding problems. Prerequisites: Genetics 616.

631. Biochemical Genetics. (2-0). Credit 2. I

A study of the genetic control of cellular metabolism and a theoretical consideration of the mechanism of gene action. A consideration of nutrition and the genetic capacity for biosynthesis, gene-enzyme relationships, pleiotropism, plasmagenes, and the chemical nature of the agents of heredity. Prerequisites: Biochemistry and Nutrition 410 or Chemistry 301; Genetics 301.

685. Problems. Credit 1 to 4 each semester. I, II, S

Technical research problems subject to approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II, S

Prerequisites: Genetics 603, 620.

Poultry Husbandry 613. Breeding and Genetics of Poultry. (3-4). Credit 4. II

See page 362 for a full description of this course.

Department of Geography

Professor G. W. Schlesselman;
Assistant Professor D. I. Eidemiller; Instructor J. D. Wilson

201. Principles of Geography. (3-0). Credit 3. I, II, S

The study of human society in relation to the physical conditions and natural resources of the earth. This course should make clear such factors of the natural environment as location, climate, relief soils, surface and underground water, minerals and forests, with emphasis on the human response to these factors.

203. Physical Geography. (3-3). Credit 4. I, II

This course consists of a systematic description and interpretation of the distribution patterns and the regional associations of natural phenomena on the face of the earth.

204. Economic Geography. (3-0). Credit 3. I, II

A study of the commercial regions of the world, dealing with the production types or occupations, such as grazing, plantation farming, grain farming, fishing, lumbering, mining, and manufacturing.

301. Geography of North America. (3-0). Credit 3. I

A regional study of the continent, emphasizing adjustments made to natural environment. The human-use regions, such as the Cotton Belt, will be studied; also the natural regions, such as the Great Plains or the Appalachian Highlands. (Offered in 1955-56 and in alternate years thereafter.)

302. Geography of Europe. (3-0). Credit 3. II

A geographical survey of Europe as a whole and of the individual countries.

303. Geography of South America. (3-0). Credit 3. I

Investigations of trade opportunities in South America. The economic activities of the major geographic regions as reflecting the present day utilization of the natural resources. Possibilities of future development.

304. Geography of Asia. (3-0). Credit 3. II

A general study of the continent of Asia and a more detailed study of selected regions.

306. Meteorology. (3-0). Credit 3. I

This course aims to present concisely and systematically the science of meteorology in its present state of development. The primary purpose is to set forth the facts and principles concerning the behavior and responses of the atmosphere.

308. Geography of Texas. (3-0). Credit 3. II

A regional study of the State emphasizing the influences of the natural environmental factors (location, surface features, natural resources, atmospheric condition, and water bodies) on economic activities and distribution of population. (Offered in 1954-55 and in alternate years thereafter.)

310. Climatology. (3-0). Credit 3. II

A study of the nature and elements of climate and the factors that give rise to climatic differences and that determine the distribution of climatic types.

312. Conservation of Natural Resources. (3-0). Credit 3. II

A study of natural resources including ways and means of insuring wise utilization of essential or strategic resources.

401. International Political Geography. (3-0). Credit 3. I †

A study of some of the present social and political problems of world powers and also the weaker nations. An effort to find geographic factors back of these problems and possible geographic adjustments. (Offered in 1954-55 and in alternate years thereafter.)

FOR GRADUATES

601. Economic Geography. (4-0). Credit 4. I

A regional survey of the world distribution of major agricultural and industrial commodities with particular attention to the causal action of natural, social, and economic factors. (Offered in 1955-56 and in alternate years thereafter.)

Department of Geology

Professor S. A. Lynch,
Professors H. R. Blank, T. J. Parker, W. A. Price, W. L. Russell, Paul Weaver; Associate Professors C. L. Seward, Jr., F. E. Smith; Assistant Professors L. de A. Gimbrede, T. R. Goedicke, W. J. Morris

201. General Geology. (3-0). Credit 3. I, II

The agents and processes that have produced the surface features of the earth and the structure of the earth's crust. Prerequisites: Chemistry 101 or equivalent; registration in Geology 203 or 207.

203. Crystallography and Mineralogy. (2-6). Credit 4. I, II

Crystallography and descriptive mineralogy. Sight recognition of crystal forms and of common minerals. Prerequisites: Chemistry 102; Mathematics 103 or equivalent.

204. Mineralogy and Rock Study. (1-3). Credit 2. II, S

Continuation of Geology 203. Recognition and classification of common rocks by their megascopic characteristics. Prerequisite: Geology 203.

205. Elementary Geology. (3-3). Credit 4. I, II

General principles of physical geology, physiography, geologic processes, and an introduction to historical geology. Laboratory work on common minerals, rocks, and maps. Elective for arts and science students.

207. Mineralogy and Rock Study. (2-6). Credit 4. I

Practical hand specimen determination of common minerals and rocks by means of their physical properties. Study of well cuttings and cores. This course should be taken simultaneously with Geology 201. A course designed for petroleum engineers and not available to geology majors. Cannot be substituted for Geology 203. Prerequisites: Chemistry 102; Mathematics 103 or the equivalent.

209. Introduction to Field Work. (0-3). Credit 1. I, II

One-half day each week studying geologic processes. Scientific methods of field work are stressed. Should be taken concurrently with Geology 201 and cannot be taken for credit after credit is received for Geology 210.

210. Historical Geology. (3-3). Credit 4. II, S

Principles of stratigraphy and paleontology, the physical and organic record of the earth's history, hypotheses of the earth's origin. Prerequisites: Geology 201 and 203, or 201 and 207, or 205.

299. Field Geology. Credit 2. Intersession

Geological observations and mapping in an area exhibiting diversity of rock types, structures, and physiography. Prerequisites: Geology 209, 210.

300. Field Geology. Credit 6. S

Geologic mapping in selected areas in the Llano Uplift and the Marathon Basin. Written report. Prerequisites: Geology 204, 306, 312.

303. Petrography and Petrology. (2-3). Credit 3. I

Principles of optical mineralogy; identification of minerals in fragments and thin sections by use of the petrographic microscope; thin section study of igneous rocks, and their classification. Prerequisite: Geology 204.

304. Sedimentary Petrography. (2-3). Credit 3. II

Microscopic study of sedimentary and metamorphic rocks in thin sections; heavy mineral analysis; description, origin, and classification of sedimentary and metamorphic rocks. Prerequisite: Geology 303.

305. Invertebrate Paleontology. (3-3). Credit 4. I

The morphology, classification, and geologic range of the principal invertebrate groups. Prerequisite: Geology 210.

306. Stratigraphy. (3-3). Credit 4. II

Stratigraphic studies of the United States with emphasis on the Gulf Coastal Plain formations and their correlation by means of invertebrate fossils. Laboratory studies consist of stratigraphic principles and the changing faunas through geologic time. Prerequisite: Geology 305.

309. Agricultural Geology. (3-3). Credit 4. II

Erosion, transportation, and deposition by water, wind, and ice. Chemical and physical processes of development and destruction of soils. Origin, development and interpretation of surface features of the earth. Elements of earth structure and geologic history. Earthquakes, volcanoes, and mountains. Laboratory work in determination of rockmaking minerals and common rocks and intepretation of topographic and geologic maps.

311. Petroleum and Structural Geology. (3-3). Credit 4. I

A detailed study of the origin, migration, and accumulation of petroleum with special consideration of typical productive areas. Interpretation of rock structures. Laboratory devoted to subsurface work. Limited to non-geology majors. Prerequisites: Geology 201, 207, 210.

312. Structural Geology. (2-3). Credit 3. II

The interpretation of rock structures; their relation to stratigraphic, physiographic, and economic problems. Prerequisites: Geology 201, 203, 204, 210.

315. Principles of Sedimentation. (2-3). Credit 3. I

Factors of environment, production, transportation, and deposition of sediments; products resulting from the operation of sedimentary processes; structures, textures, and colors of sediments. Laboratory work in collecting and sampling, mechanical analysis, methods of analyzing and presenting data. Prerequisites: Geology 201, 203, 204, 210.

320. Geology for Civil Engineers. (2-3). Credit 3. I, II

Principles of dynamic and structural geology and study of common minerals and rocks with their relationships and applications to construction, foundation, and excavation. Prerequisite: Junior classification in civil engineering.

399. Field Geology of the Gulf Coast Tertiary. Credit 6. S

Mapping, stratigraphy, and structure in the Tertiary of the Gulf Coast area. Given as a summer field camp. May be used to substitute for Geology 433 and 4 hours of technical elective. Prerequisite: Geology 300.

404. Geology of Petroleum. (2-3). Credit 3. I

Origin, migration, and accumulation of petroleum. Typical United States oil and gas fields. Laboratory work in subsurface geology. Prerequisites: Geology 300, 306, 312.

406. Economic Geology. (3-0). Credit 3. II

The application of principles of geology, chemistry, and physics to the formation of useful minerals and rocks and a general survey of such deposits. Prerequisites: Geology 300, 306, 312; senior classification.

409. Geology of Non-Metallics Other than Petroleum. (3-0). Credit 3. I

The mineralogy, stratigraphic, and structural relations, origin, geographic distribution, uses, and economics of non-metallic mineral deposits other than petroleum. Prerequisites: Geology 300, 306, 312; senior classification.

422. Natural Structural Materials. (2-3). Credit 3. II

Building stones and stone products, with special emphasis on clays and clay products, their qualities, occurrences, uses, and processes of fabrication and manufacture. For students registered in architecture or engineering. Prerequisite: Junior classification.

423. Micropaleontology. (1-6). Credit 3. II

A systematic survey of the important groups of micro-fauna with particular emphasis on their classification and use. Prerequisite: Geology 305.

425. Subsurface Geology. (2-3). Credit 3. II †

Study of well cuttings and cores; electrical, radioactive, drilling time, and caliper logs. Preparation of subsurface contour maps and cross sections. Prerequisites: Geology 300 and 404; or 311 and senior classification in petroleum engineering.

431. Geomorphology. (2-3). Credit 3. I

Principles and fundamentals of geomorphology. Laboratory work in advanced map interpretation. Prerequisites: Geology 300, 306, 312.

433. Field Geology. (0-6). Credit 2. II †

Two full afternoons per week devoted to the acquirement of techniques of field geology in areas adjacent to the campus. Prerequisites: Geology 300, 306.

435. Geophysical Prospecting for Petroleum. (3-3). Credit 4. I †

A study of the methods and instruments used in geophysical prospecting for petroleum deposits. Prerequisite: Senior classification in geology or petroleum engineering or approval of Head of the Department.

436. Interpretation of Geophysical Data. (1-6). Credit 3. II †

Interpretation of geophysical data secured from geophysical instruments in terms of underground structures favorable to the accumulation of oil and gas deposits. The use of geophysical data in connection with the field development program. Prerequisite: Geology 435.

437. Cenozoic Micropaleontology. (1-6). Credit 3. I †

Cenozoic micro-fauna of the Gulf Coast Province with emphasis on subsurface correlation. Prerequisite: Geology 423.

439. Mesozoic Micropa'eontology. (1-6). Credit 3. II †

Mesozoic micro-fauna with emphasis on subsurface correlation. Prerequisite: Geology 423.

441. Advanced Engineering Geology. (3-3). Credit 4. I †

A survey of those phases of mineralogy, petrology, historical geology, structural geology, and sedimentation that may be applied to engineering problems. Not available to geology or petroleum engineering majors. Prerequisites: Senior classification; approval of Head of Department.

443. Paleontology. (2-3). Credit 3. II

Advanced invertebrate paleontology—megafossils. Prerequisite: Geology 305.

449. Seminar. (1-0). Credit 1. I

Review of current literature and technical developments. Discussion of certain legal aspects of the petroleum industry. Each student will make both oral and written reports. Prerequisites: Geology 300, 306, 312.

450. Seminar. (1-0). Credit 1. II

Continuation of Geology 449. Each student will prepare more advanced reports. Prerequisites: Geology 300, 306, 312.

FOR GRADUATES

605, 606. Special Geology. Credit 2 to 6 each semester. I, II

Advanced work along specialized lines for properly qualified students. May include independent investigation of problems in various phases of geology. Prerequisite: Approval of Head of Department.

607, 608. Mineral Deposits. (4-0). Credit 4 each semester. I, II

Genesis, occurrence, characteristics and associations of mineral deposits other than petroleum and gas. A consideration of the uses and economics of these deposits. Prerequisite: Geology 406.

609, 610. Field Geology. Credit 2 to 6 each semester. I, II, S

Systematic geologic surveying of selected areas. Prerequisite: Geology 300.

612. Structural Geology. (3-4). Credit 4. I

A detailed study of geologic structures and a consideration of theories regarding earth movements, with selected readings. Prerequisite: Geology 312.

616, 617. Micropaleontology. (1-6). Credit 3 each semester. I, II

Study of microscopic fossils and their uses in correlation. Laboratory work in the examination of well samples. Prerequisite: Geology 423.

618. Sedimentation. (2-6). Credit 4. II

Investigation of processes of sedimentation with analytical laboratory work on sedimentary rocks. Seminar. Prerequisite: Geology 315.

619. Petroleum Geology. Credit 2 to 6 each semester. II

A theoretical study of some of the problems in petroleum geology. Prerequisite: Geology 404.

620. Geology of Ground Water. (3-0). Credit 3. I

Principles of occurrence and movement of water beneath the earth's surface, and the influence of various geologic situations upon its behavior. Factors applying to estimates of supply. Engineering aspects of ground water.

622. Stratigraphy. (3-0). Credit 3. I

Sources and depositional environment of sediments, character and relation of sedimentary strata, and the principles involved in delimiting, correlating, and naming stratigraphic units. Prerequisite: Geology 618.

625. Advanced Ground-Water Geology. (1-3). Credit 2. II

Seminar course in the application of the principles of advanced geology to the development and use of ground water supplies. To be taken concurrently with Civil Engineering 630, Ground Water Hydrology. Prerequisites: Geology 620 or the equivalent; approval of Head of Department.

627. Continental Evolution Outside of North America. (2-0). Credit 2. II

A reading and conference course on the available literature, dealing with the basic geology of areas outside of North America in which industries and governments are asking for the services of American geologists. Designed for students contemplating foreign service. Areas to be studied will be suited to individual needs.

629. Structural Framework of North America. (3-0). Credit 3. I

Description of the important geologic structures of North America and of the development of regional structural features in geological times. Prerequisite: Graduate classification.

631. Geology in Engineering Construction. (3-0). Credit 3. I

Geologic principles applied to the construction of highways, foundations, bridge abutments and piers, tunnels, dams, reservoirs, etc. Construction materials. Test borings and their interpretation. Prerequisite: Geology 441.

633. Geological Problems in Engineering. Credit 2 to 4. II

Topics to be considered will vary from year to year. Prerequisite: Geology 441.

639. Paleozoic and Mesozoic Paleontology. Credit 3 to 6. I

Study of the important faunas of these eras. Prerequisites: Graduate classification; approval of Head of Department.

640. Cenozoic Paleontology. Credit 3 to 6. II

Study of the important faunas of this era with emphasis on the megafossils of the Gulf Coast. Prerequisites: Graduate classification; approval of Head of Department.

643. Pa'eozoic Stratigraphy. Credit 3. I

Stratigraphy of the Paleozoic System with particular emphasis on the Paleozoic of West Texas and Oklahoma. Prerequisites: Graduate classification; approval of Head of Department.

644. Mesozoic Stratigraphy. Credit 3. II

Study of the stratigraphy of the Mesozoic System. Prerequisites: Graduate classification; approval of Head of Department.

645. Cenozcic Stratigraphy. Credit 3. II

Study of the Cenozoic System. Prerequisites: Graduate classification; approval of Head of Department.

646. Gulf Coast Stratigraphy. Credit 3. II

Detailed study of the Mesozoic and Cenozoic Systems of the Gulf Embayment. Prerequisites: Graduate classification; approval of Head of Department.

647. Pleistocene Geology. (2-3). Credit 3. II

Stratigraphy and historical geology of the Pleistocene deposits with emphasis on the non-glaciated areas (Coastal Plain, High Plains, and other depositional plains) and the alluvial, deltaic, and eolian deposits. Prerequisites: Graduate classification in geology or geological oceanography; approval of Head of Department.

685. Problems. Credit 1 to 4 each semester. I, II, S

A course to enable graduate students with a major or minor in geology to undertake and complete with credit limited investigations which do not fall within their thesis or dissertation research and are not covered in the established curricula. Geological problems in engineering are included. Prerequisites: Graduate classification; approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II, S

Original research on problems in various phases of geology. Research for thesis or dissertation.

Department of History

Profssor S. R. Gammon,
Professor R. W. Steen; Associate Professors J. H. Bass, J. H. Hill, J. M. Nance, A. B. Nelson; Assistant Professors J. T. Duncan, T. L. Miller, P. J. Woods; Instructors C. H. Hall, R. L. Harris

105. History of the United States. (3-0). Credit 3. I, II, S

English colonization; the Revolution; adoption of the constitution; growth of nationalism; cotton and the slavery problem; war for Southern independence; reconstruction.

106. History of the United States. (3-0). Credit 3. I, II, S

New social and industrial problems; rise of the progressive movement; United States emergence as a world power; World War I; reaction and the New Deal; World War II; one world or none.

213. History of England. (3-0). Credit 3. I

British, Saxon, and Norman origins; national development; struggles between church and state; crown and nobles; nobles and commons; development of parliament. Required in three-year pre-law program and of majors in history.

214. History of England. (3-0). Credit 3. II

Agrarian and Industrial Revolutions; relations with Ireland; evolution of democracy; struggles with France and Napoleon; social legislation in the twentieth century; growth of the Empire until World War II. Required in three-year pre-law program and of majors in history.

217. Development of Europe. (3-0). Credit 3. I

The History of Western Europe in the Middle Ages. A survey of the development of European civilization from the decline of the Roman Empire to the Renaissance. The course is designed to give the student historical perspective as well as a basic historical knowledge of the period. Major topics include the Graeco-Roman heritage, the barbarian migrations, the growth and development of the church, the rise of capitalism, medieval society, and the origin of nationalism in Europe. Required of majors in history.

218. Development of Europe. (3-0). Credit 3. II

The History of Western Europe from the Renaissance to the present. A survey of modern European civilization, dealing especially with the Renaissance and the Reformation, the Age of Reason and the French Revolution, the Napoleonic wars, the growth of nationalism and democracy in the nineteenth century, the causes and consequences of the two world wars and the rise of dictatorship. Required of majors in history.

305. Government of the United States and Texas.* (3-0). Credit 3. I, II, S

The organization, functions, and nature of the national government; the rights and privileges of citizenship, the immigration and naturalization laws, all as closely related to the constitution as possible, are treated first. A similar treatment is then applied to the government of Texas. Open only to military juniors and seniors in education, agricultural education, industrial education, and physical education.

306. American National Government.* (3-0). Credit 3. I, II, S

The organization, functions, and nature of the national government; the rights, privileges, and obligations of citizenship; immigration and naturalization laws, all as closely related to the constitution of the United States as possible. Required of all students as a condition of graduation.

307. State and Local Government.* (3-0). Credit 3. I, II, S

The nature, organization, and general principles of local government in the United States with especial attention to these forms of government in Texas. Prerequisite: History 306 or its equivalent. Required as condition to degree of all students who have not had at least three semester hours credit in military science before graduation, and also of all who seek a teacher's certificate.

*History 305 or History 306 and 307, American government, are required of all who would be eligible to teach in the public schools of Texas

308. United States Constitutional Development. (3-0). Credit 3. II

A study of leading decisions of the Supreme Court. The various trends in our constitutional growth since 1789 are treated as well as the expansion through judicial interpretation of the powers delegated to the national government. Some attention is given to legal terminology and to the composition and functioning of the national judiciary. Required of all pre-law students in three-year pre-law program. Prerequisites: History 105, 306.

313. The Latin-American Nations to 1820. (3-0). Credit 3. I

The period when the Americas south of the United States belonged to Spain and Portugal; discovery; colonial system; social and economic aspects; the wars of independence to the founding of the republics. A complete unit available for independent credit. Required of history majors.

314. The Latin-American Republics, 1820 to the Present. (3-0). Credit 3. II †

The twenty Latin-American republics since 1820; independence and the dictators; rise of the ABC states; Latin-American civilization after a century of independence; relations with Europe and with the United States in Pan-American movement; participation in world affairs. A complete unit available for independent credit. Required of history majors.

315. The United States, 1901 to the Present. (3-0). Credit 3. S †

A study of United States history during the twentieth century. Emphasis is laid primarily on the development and application of progressive principles from the "square deal" of the first Roosevelt to include the subsequent "new deal" and "fair deal" of the Roosevelt and Truman administrations; secondary emphasis is on the international relations of the United States as the nation became a world power, moved from isolation to leadership and back, followed by the development of the "good neighbor" policy toward Latin-America and our participation in World War II. The United Nations and problems.

316. The Institutional Background of Texas, 1519-1845. (3-0). Credit 3. S †

A study of the history of Texas from the Spanish period to annexation to the United States. Particular stress is placed upon the Spanish legal and administrative system. The Mexican administrative system, the establishment of Anglo-Americans in Texas, the revolution, the republic, and the fight for annexation. In each of these topics emphasis is placed upon principles and developments of this period which are reflected in the state's present-day society.

318. International Developments since 1918. (3-0). Credit 3. I †

A general survey of world politics since the close of World War I. Particular attention will be given to the problems and ideologies of the great powers of Europe and to those factors and conditions which explain present political tendencies and policies. Due consideration will also be given to colonial problems in Asia and Africa, the Sino-Japanese question, and the clash of United States-Japanese policies. World War II; the conflict of ideologies. Required of history majors.

322. Industrial History of the United States. (3-0). Credit 3. I, II

Emphasizes industrial growth of the United States, agricultural changes and development, economic expansion of the United States in industries and commerce, rise of labor and capital organizations, the tariff and banking, and conservation of natural resources.

325. Trends in American History. (3-0). Credit 3. I, II

The sources and development of leading American institutions constituting representative democracy, their influence upon our nation's development and upon the twentieth century world. Course stresses the institutional rather than the chronological and political aspects of the United States, endeavoring to present what has been well styled "The Epic of America."

422. International Rivalry in the Gulf-Caribbean Area, 1840 to the Present. (3-0). Credit 3. I

Baekground of Spanish colonial policy, with British, French, and Dutch intrusion; conflict of interests; influence of islands on mainland settlement. Early United States interest; Monroe Doctrine and its extension; vital treaties with Colombia and Great Britain. European interests in the islands, Central America, Mexico, and Venezuela. Later policies of the United States, rise of Pan-Americanism and Pan-Hispanism. First reciprocal trade treaties and rise of United States imperialism. Policy of "the good neighbor" under Wilson and Roosevelt. Recent progress of Pan-Americanism toward western hemisphere solidarity. May be substituted by history majors for History 313 or 314. (To be offered in 1955-56.)

423. American Foreign Relations. (3-0). Credit 3. I †

The history of the United States foreign relations and development of our leading foreign policies to 1868. The Revolution and alliance with France; the development of isolation and neutrality; neutral rights and the War of 1812; nationalism and the Monroe Doctrine; Manifest Destiny and its consequences; diplomacy of the Civil War; the Monroe Doctrine applied to France in Mexico; the "Alabama" claims arbitration.

Open to all seniors and to juniors who have had one college course in history or government. Required of history majors.

424. American Foreign Relations. (3-0). Credit 3. II †

The history of the United States foreign relations and development of our leading foreign policies, 1875 to the present; America becomes a world power; imperialism; World War I and the failure of neutrality; the League of Nations and its desertion; Pan-Americanism; failure of disarmament and rise of aggression; neutrality fails again; World War II; the United Nations and problems.

Open to all seniors and to juniors who have had one college course in history or government. Required of history majors.

425. United States Policy in the Far East, 1841 to the Present. (3-0). Credit 3. I

An examination of the principles and policy of the United States in its political and economic contacts with China and Japan during the century just ended. The origin and development of initial contacts; imperialism and the "Open Door"; Japanese opportunistic aggression; the treaty status of the Pacific; the attitude of the Philippines; Axis policy in the Orient; post-war policy.

Open to all seniors and to juniors who have had one college course in history or government. May be substituted by history majors for History 423 or 424. (To be offered in 1956-57.)

Department of Horticulture

Professor G. W. Adriance,
Professor F. R. Brison; Associate Professor H. T. Blackhurst; Assistant Professors A. H. Krezdorn, H. C. Mohr, L. E. Spangler

201. General Horticulture. (2-2). Credit 3. I, II

A survey of the general field of horticulture; the growth and fruiting habits of horticultural plants; a study of the principles and practices of propagation, including seedage, cuttage, graftage, and special methods; a study of the planting, care, culture, harvesting, handling, and utilization of fruit and vegetable crops. Prerequisite: Biology 101.

311. Processing Horticultural Crops. (2-3). Credit 3. I

A study of the principles and practices of canning, quick freezing, dehydration, pickling, and juice manufacture of fruits and vegetables. Fundamental concepts of the various techniques of preparation, processing, packaging, and use of additives will be given. Field trips to commercial processing plants will be made.

319. Orchard Management. (2-2). Credit 3. II

Study of orchard practices including soils and sites, planting, cultivation, pruning, spraying, harvesting, temperature relations, water relations, and selection of varieties. Prerequisite: Horticulture 201.

322. Vegetable Crops Management. (2-3). Credit 3. II

The principles of vegetable crop production will be covered. The factors of climate, soil, crop rotation, variety, plant growing, transplanting, planting, irrigation and drainage, weed control, insect and disease control, harvesting, marketing, storage, and special cultural practices will be considered. All of the major vegetable crops will be discussed with reference to these factors.

418. Nut Culture. (1-3). Credit 2. II †

Importance of nut crops, emphasis on pecan; problems of developing and maintaining pecan groves; developing native trees; study of varieties, fruit setting, soils, fertilizers, propagation methods, harvesting, handling, shelling, storage, and marketing the crop. Practice: Budding and grafting nursery stock, topworking native trees, storage and handling of budwood, examination of soils, spray application, visits to shelling plants.

422. Citrus and Subtropical Fruits. (2-2). Credit 3. I †

A study of subtropical fruits, with attention to citrus fruits, figs, olives, avocados, and dates. Practice: Study of varieties of subtropical fruits and their products; propagation and care of the various subtropical fruits. Prerequisite: Agronomy 301 or Plant Physiology and Pathology 313.

426. Commercial Propagation. (2-2). Credit 3. II †

A study of principles and practices followed in the propagation of fruit trees. The course includes a study of graft union, congeniality between stocks and scions, adaptation of stocks to environment, and commercial propagation practices for important fruits. Practice includes special treatments for seeds, budding, grafting, and transplanting for important fruits.

427. Seminar. (1-0). Credit 1 each semester. I, II †

Review of current experimental work in the field of horticulture, presented by staff members, graduate and senior students. Required of all graduate and senior students in horticulture, and restricted to these students.

432. Deciduous Fruits. (2-2). Credit 3. II †

A study of the deciduous fruits including peaches, plums, apples, and pears and also of the important bush and vine fruits including grape, strawberry, and bramble fruits. Laboratory work will include description and identification of varieties and specialized problems in management. Prerequisite: Agronomy 301 or Plant Physiology and Pathology 313.

434. Grading and Packing Vegetables. (2-2). Credit 3. I †

A consideration of the factors of good quality in market vegetables. Standard grades and packages. Shipping methods. The relation of production methods to quality. Transit losses. The methods of marketing open to the producer. Recent trends in marketing and packaging.

436. Vegetable Crops. (2-3). Credit 3. II †

A study of the principal types and varieties of vegetable crops, their response to environmental changes; their identifying characteristics, typical yield, quality and market acceptance. Emphasis will be placed upon study of crops in the field. Prerequisites: Genetics 301; Plant Physiology and Pathology 313.

441. Problems in Horticulture. Credit 1 to 4. I, II

Special problems in fruit and vegetable crop production and processing. Prerequisites: Senior classification; approval of Head of Department.

FOR GRADUATES

601. Environmental Relations of Fruit Plants. (3-3). Credit 4. I

Water, soil, and temperature relations of fruit plants, and their modification by management practices will receive primary consideration. Specific problems of management will be studied under field conditions.

602. Factors Influencing Fruit Production. (3-3). Credit 4. II

Responses of the principal fruit plants to pruning, differentiation of fruit buds, and internal and external factors influencing fruit setting will be considered in detail. Field studies of important problems will receive considerable attention.

603. Structure of Vegetable Plants. (3-3). Credit 4. I

A consideration of the morphological and anatomical features of important families of vegetable plants and the relation of these features to growing practices and progressive improvement of the various plants. Prerequisite: Biology 619 or 623.

604. Physiology of Vegetable Plants. (3-3). Credit 4. II

The topics of thermoperiodism, photoperiodism, nutrient deficiencies, water relations, temperature relations, fruit setting, growth, and seed germination will be taken up for each of the major vegetable crops. The recent developments in the use of hormones and selective herbicides in vegetable production will be discussed. Prerequisites: Horticulture 322; Plant Physiology and Pathology 314.

611. Fruit Production Principles. (2-3). Credit 3. S

A general coverage of water, temperature, and nutrient requirements of fruits and their application to orchard practice. Stress is on application rather than the physiological basis for orchard practices. Not for horticultural majors. Prerequisite: Horticulture 319.

613. Vegetable Production. (2-3). Credit 3. S

The taxonomy, morphology, physiology, and genetics of vegetable plants will be reviewed. Cultural techniques and equipment will be emphasized. Not for horticultural majors. Prerequisite: Horticulture 322.

685. Problems. Credit 1 to 4 each semester. I, II, S

A comprehensive review of fundamental principles in research and methods employed in research. Practice in the various techniques which may be used in different investigations of horticultural problems.

691. Research. Credit 1 or more each semester. I, II, S

Research in horticultural problems for thesis or dissertation.

Department of Industrial Education

Professor C. H. Groneman;
Associate Professor W. E. Wright; Assistant Professor L. B. Hardeman;
Instructors C. A. Bertrand, J. L. Boone, F. D. Nixson

105. Wood Craft. (1-5). Credit 3. I, II

A comprehensive study of woods, wood products, and wood industries; including growth and botanical structure, production and uses, design, construction, and finishing.

106. Sheet Metal. (1-5). Credit 3. II

A study of industrial practices in developing, laying-out, and fabricating sheet metal products. Problems involving parallel-line, radial-line, and triangulation will be provided.

107. Industrial Materials and Manufacturing Processes. (2-3). Credit 3. I, II

A study including the processing of woods, metals, fuels, ceramics, and plastics; the fabrication of products from these materials; concepts of accepted manufacturing processes. Laboratory work will consist of problems involving experimentation.

204. Development and Practice in Industrial Education. (2-0). Credit 2. II

The history and development of industrial education, its meaning and objectives, and present practices in schools and industry.

205. Ornamental Iron. (1-5). Credit 3. I

A study of metals and metal products; including the alloying and proper use of iron, steel, aluminum, copper, brass, and bronze. Problems involving casting, spinning, machining, forging, welding, tubular construction, and electroplating are required.

301. Methods of Teaching and Class Management. (2-0) or (3-0). Credit 2 or 3. I

An introduction to the fundamentals of teaching as applied to industrial subjects; the management of the class, equipment, and supplies. (Methods)

304. Applied Industrial Electricity. (2-3). Credit 3. I, II

A theoretical and practical study of electrical circuits, motors, generators, transformers, lighting, controls, and instruments. Laboratory experiences consist of experiments and projects in circuits and machines.

308. A Study of Modern Industries. (3-0). Credit 3. I

The political, historical, and geographical factors which have a direct influence upon the development and distribution of industries. Specific studies of individual industries are made, such as iron and steel, paper, automobiles, petroleum, cement, leather, plastics, and textiles. Essential features of these industries are considered: location, machinery, power, raw material, market, labor.

310. Course Making. (2-0). Credit 2. II

Methods of outlining courses of study to meet the needs of the different types of classes. Each student will make a complete course for some particular subject. (Methods)

323. Methods of Teaching Mechanical Drawing. (1-3). Credit 2. I

The student should have completed courses equivalent to Engineering Drawing 105, 106 before attempting this work. Analysis of problems and the selection of instructional material and methods of presentation for general drafting. (Methods)

326. General Metalwork. (1-5). Credit 3. I, II

The designing and construction of power machinery including the development of plans of procedure, jigs, and fixtures. A study is made of materials and industrial processes and procedures of the foundry, welding, and machine shop.

327. Industrial Arts Handcraft. (1-5). Credit 3. I

Development and preparation of instructional materials; designing and building of teaching type projects and problems in plastics, leather, bookbinding, and other related handcraft activities. Prerequisite: Nine hours of shop courses. (Elementary Education)

328. Industrial Accident Prevention. (3-0). Credit 3. I, II

Analysis of fundamentals for accident prevention and their application to industrial supervision and management. Prerequisite: Junior or senior classification.

332. Plastics and Ceramics. (1-3). Credit 2. I

Sources, manufacture, supply, and uses of plastics and ceramic materials; designs appropriate for plastics projects; essential processes in fabrication of plastics and ceramic objects.

334. Upholstery. (1-3). Credit 2. II

Instruction in the essentials of upholstery processes, including the construction of frames and foundations with and without springs. Prerequisite: Industrial Education 105.

336. Design in the Arts and Crafts. (1-3). Credit 2. II

Analysis and solution of design problems applicable to the arts and crafts. Experiences are provided for the designing of industrial products related to industrial arts through the use of common presentation media, proportion, balance, and harmony. Prerequisites: Engineering Drawing 105, 127; Industrial Education 105; Mechanical Engineering 106, 201, 202, 309.

337. Planning a Community Program. (1-6). Credit 3. I, II

A survey of high school pupils and of occupational opportunities in the community will be made. A plan will be developed for practical arts and vocational education classes to meet the needs of the community. At least one new course will be put into operation. Prerequisite: Industrial Education 204.

339. Modern Concepts of Vocational Education. (1-6). Credit 3. I, II

A study of current literature, legislation, and trends affecting practical arts and vocational education. Prerequisite: Industrial Education 204.

341. Applied Course Making. (1-6). Credit 3. I, II

The organization of a complete two-year course of study based on the equipment available and the type of industry in the community, to include a course outline, teaching plans, lesson plans, and progress charts. Prerequisite: Industrial Education 310 or 423.

404. Visual Aids for Industrial Subjects. (1-2). Credit 2. I †

This course is designed to develop an understanding of, need for, construction of, and use of visual aids for instruction in industrial subjects. Student activity consists of determining values of color in aids, use of projection equipment, mock-ups, posters, and blackboard illustrations.

406. Vocational Guidance. (2-0). Credit 2. I †

A study of the instruments and techniques of vocational guidance, its relation to education and industry, its meaning and purpose, and the analysis of methods of investigation and guidance procedures. (Guidance)

409. Methods of Introducing Industrial Organizations and Management into Industrial Schools. (2-0). Credit 2. S †

The management of modern industrial enterprises and the possible adaptation to industrial schools.

415. Practice Teaching. (2-5). Credit 4. I

Arrangements will be made for the student to do practice teaching in the Bryan High School Industrial Arts Department or the A. & M. College Consolidated High School. (Methods)

416. Practice Teaching. (2-5). Credit 4. II

Arrangements will be made for the student to do practice teaching in the Bryan High School Industrial Arts Department or the A. & M. College Consolidated High School. (Methods)

419. Laboratory of Industries Methods. (1-3). Credit 2. II †

The student will make a study of the units of industries as generally recommended for public school industrial arts and will select, plan, and design problems and projects to meet these requirements. (Methods)

420. Follow-Up, Visitations, and Coordination in Part-Time Schools. (2-0). Credit 2. S †

Selecting occupations suitable for young people to learn, placing students in suitable employment on a part-time basis, and coordinating their school duties with their work activities.

423. Analysis Procedure. (1-2). Credit 2. I, II †

Analysis is made of occupations to obtain content for instructional information. Jobs and operations are studied to determine the order and content of operation, job description, job evaluation, and job safety.

424. Organization of Instructional Material. (1-2). Credit 2. S †

A study will be made of published material available in the student's occupational field. Those parts found suitable for vocational classes will be indexed and organized for class use. Types of instruction sheets found necessary for efficient teaching will be written. (Methods)

427. Traffic Safety and Automobile Operation. (1-3). Credit 2. I, II

A study and the application of state and federal regulations and policies governing the efficient and safe operation of automotive vehicles in traffic. (Methods)

429. Foremanship and Supervision. (3-0). Credit 3. I

Positions of supervisory responsibility in an industrial organization; relation of supervisor to the supervised and supervisors; and procedures for meeting the responsibilities of the positions. Prerequisite: Senior classification.

431. Program Organizations and Management. (1-6). Credit 3. I, II

Organization and management systems to be studied and adapted including physical layout, timekeeping, tool checking, purchasing, selling, storage and supplies, and inventory procedures to be planned and installed. Color schemes and other fatigue and accident preventive measures also to be adapted to the particular situations. Prerequisite: Industrial Education 409.

433. Development of Instructional Material. (1-6). Credit 3. I, II

The student will make a study of the published material in his particular field. He will organize and prepare such job or operation, information and assignment sheets as may be needed for shop or technical courses. Prerequisite: Industrial Education 424.

435. Development of Instructional Devices. (1-6). Credit 3. I, II

The study of typical instructional devices as used in business, industry, and schools. The designing and building of suitable mock-ups, cut-aways, charts, and displays as may be assigned for aiding in the teaching of a particular shop or technical subject. Prerequisite: Industrial Education 404.

438. Industrial Safety. (2-3). Credit 3. II

Continuation of Industrial Education 328. This course will include analysis of various types of accident prevention; organizations and programs in industry including detail study of typical safety departments; control of environmental hazards including inspections, investigations, mechanical guarding, maintenance, and the application of safety engineering principles in design and specifications. Prerequisites: Industrial Education 328; Industrial Engineering 302; and either Industrial Education 429 or Industrial Engineering 401 or registration therein.

449. Seminar in Industrial Education. (1-0). Credit 1. I, II

General discussion of laws, legislation, certification, professional ethics, and other current problems relating to industrial and teaching fields. Prerequisite: Senior classification.

FOR GRADUATES

601. History of Industrial Education. (2-0). Credit 2. I, II, S

A study of leaders, movements, and agencies, with special emphasis on the economic, social, and philosophical factors which have contributed to the development of industrial education in the United States.

602. Industrial Arts Administration and Supervision. (2-0). Credit 2. I, II, S

Problems of the local director or supervisor of industrial arts. (Administration)

603. Administration and Supervision of Vocational Industrial Education. (2-0). Credit 2. I, II, S

Problems of the local director or supervisor of vocational industrial education. (Administration)

604. Industrial Programs for Junior Colleges and Technical Schools. (2-0). Credit 2. I, II, S

A study of the kinds, purpose, size, accreditation, growth, and teaching problems in the junior colleges, technical institutes, and adult school, with particular emphasis on organization and presentation of industrial subject material in these schools.

605. Problems in Industrial Safety. (2-0). Credit 2. I, II, S

Basic reasons for accidents; prevention of industrial accidents; qualifications and duties of safety consultants; methods of making investigations; making investigations and how to prepare safety reports.

606. Organization of Industrial Arts Department. (2-0). Credit 2. I, II, S

Problems in determining the type and size of industrial arts programs for the various types and sizes of schools with plans for the organization of each. (Administration)

609, 610. Methods of Teaching High School Drawing. (2-3). Credit 3 each semester. I, II, S

A survey of the field of drawing. The developing and organizing of problems and teaching devices. The first semester is devoted to general mechanical drawing as taught in the first two years of high school, the second semester to machine drawing. Either semester may be taken separately. (Methods)

614. Guidance Seminar. (2-0). Credit 2. I, II, S

The organization of occupational information; educational and vocational guidance; counseling case problems. Prerequisite: Industrial Education 406 or equivalent. (Guidance)

616. Methods of Teaching Industrial Arts in Secondary Schools. (2-0). Credit 2. I, II, S

Selecting and organizing instructional material for problems in a particular arts activity. (Methods)

618. Tests and Measurements in Industrial Education. (2-0). Credit 2. I, II, S

A study of testing and measuring devices and their application to industrial education subjects.

619. Related Subjects in Part-Time Cooperative Programs. (2-0). Credit 2. I, II, S

The organization and presentation of content material necessary in part-time cooperative programs, and the direction of the study of the students engaged in such programs. (Methods)

621. Philosophy of Vocational Education. (2-0). Credit 2. I, II, S

The basic principles involved in the development and operation of industrial education programs under the State and Federal vocational laws.

622. Philosophy of Industrial Arts Education. (2-0). Credit 2. I, II, S

The principles involved in the development and operation of industrial arts courses and their purpose and function in the field of general education.

623. Vocational Guidance Procedures. (3-0). Credit 3. I, II, S

A workshop approach to the study of vocational guidance, programs, relationships, group techniques, and methodology of the clinical approach. (Guidance)

626. Classroom Management and Shop Organization. (2-0). Credit 2. I, II, S

The organization of routine procedures to facilitate teaching; setting up roll-checking devices, issuing procedures for tools and materials, keeping material inventory, using assignment charts and progress charts, using student leadership in routine non-teaching class and shop routine, and keeping records.

627. Teacher Training for Local Supervisors of Trade and Industrial Classes. (2-0). Credit 2. I, II, S

A course for local supervisors of industrial education programs or individuals responsible for conducting teacher training and upgrading programs on the local level. Methods for organizing and conducting teacher improvement programs, preparation and correlation of instructional material. (Methods)

628. Organization of Vocational Industrial Schools and Classes. (2-0). Credit 2. I, II, S

Methods of making surveys, determining possible vocational education programs to meet the needs of different types of communities and the proper organization for these classes under the State plan for vocational education. (Administration)

630. Auto Mechanics. (1-4). Credit 2. I, II, S

Development and preparation of instructional materials and the testing of laboratory problems pertaining to the economic selection, operation, and maintenance of the automobile. (Methods)

631. Electricity. (1-4). Credit 2. I, II, S

Development and preparation of instructional materials and the testing of laboratory problems pertaining to practical theories and their application to electrical units within a high school program. (Methods)

632. Cabinet Making. (1-4). Credit 2. I, II, S

Development and preparation of instructional materials and the testing of laboratory problems pertaining to modern methods of kiln drying, veneer construction, upholstery, and fabrication within the furniture industry. (Methods)

633. Machine Shop. (1-4). Credit 2. I, II, S

Development and preparation of instructional materials and the testing of laboratory problems pertaining to modern practices and problems in the teaching of advanced machine shop. (Methods)

634. Ornamental Metal Work. (1-4). Credit 2. I, II, S

Development and preparation of instructional materials and the testing of laboratory problems pertaining to mild steel and tubular metal. (Methods)

681. Seminar. (1-0). Credit 1. I, II, S

General discussions of laws, legislation, certification, professional ethics, and other current problems relating to the industrial education teaching profession.

685. Problems. Credit 1 to 4 each semester. I, II, S

A course designed to enable graduate majors to undertake and complete with credit, limited investigations which do not fall within the thesis research, and which are not covered by any other course.

691. Research. Credit 1 to 4 each semester. I, II, S

Research for thesis. Topic subject to approval of the Head of the Department.

Department of Industrial Engineering

Professor A. R. Burgess,
Professors S. A. Wykes; Associate Professors R. F. Bruckart, D. E. Carlson, J. P. CoVan

202. Introduction to Industrial Engineering. (2-0). Credit 2. II

Historical background of industrial engineering, ownership, organization, plant location and layout, purchasing, inspection, standards, costs, and related factors.

302. Production Engineering. (1-2). Credit 2. I, II

A coordinated study of manufacturing processes and equipment; operation sequence planning; economic aspects of equipment selection. Tooling and processing a product from product design to final assembly for quantity production. Emphasis is placed on latest developments in manufacturing techniques. Prerequisites: Mechanical Engineering 202, 310.

401. Survey of Industrial Engineering. (3-0). Credit 3. I, II, S †

A survey of the industrial engineering field; industrial tendencies, types of ownership, organization of the plant, factors of plant location and design, arrangement of machines, control of production, motion and time study, elements of costs, compensation of labor, personnel relations, and related subjects. Prerequisite: Junior classification in engineering or business administration, or approval of Head of Department.

404. Motion and Time Study. (2-3). Credit 3. I, II †

Deals with the theory and practical application of time and motion study to the improvement of industrial operations. Techniques studied include: taking the time study; developing methods improvements through use of process charts, film analysis, and operation analysis. Practice is given in time study of actual industrial operations, and a time formula is developed. An actual industrial methods improvement is devised and a report is prepared on the improved method. Prerequisite: Junior classification in engineering or business administration.

405. Industrial Case Analysis. (1-0). Credit 1. I †

Practice in arriving at decisions in the solution of typical management problems through the study and analysis of actual case problems. Prerequisites: Industrial Engineering 202, 302, and registration in 404, 411, 414, 415.

406. Industrial Case Analysis. (1-0). Credit 1. II †

Practice in arriving at decisions in the solution of typical management problems through the study and analysis of actual case problems. Prerequisites: Industrial Engineering 202, 302, 404, and registration in 411, 414, 415.

408. Seminar. (0-2). Credit 1. II

Oral presentation of selected topics from the current literature in the field of industrial engineering. Technical films are presented which show manufacturing operations of major industrial firms and economic and social development of the United States. Prerequisite: Senior classification in industrial engineering.

410. Current Practices in Industrial Engineering. Credit 3. S

A study of outstanding applications of industrial engineering principles through direct visit to the plants in the industrial Middle West. Course comprises a three-weeks tour, with emphasis on discussion with men in industry who have pioneered in new ideas in organization, labor relations, materials handling, incentive plans, production control, quality control, and other important management techniques. Prerequisite: Junior classification in industrial engineering.

411. Wage and Salary Control. (3-0). Credit 3. I, II †

Personnel procedures, methods of selecting employees, wage systems, wage administration, job evaluation, merit rating, salary classification, fringe rates, morale building. Prerequisite: Junior classification in engineering or busness administraton, or approval of Head of Department.

412. Labor and Industry. (3-0). Credit 3. I, II †

A brief review of the history of organized labor; critical study of fundamental Federal and State laws governing labor-management relations; study of current interpretations of labor laws, controversial labor-management issues and their solutions. Prerequisite: Senior classification in engineering or business administration, or approval of Head of Department.

414. Statistical Control of Quality. (2-3). Credit 3. I, II †

The engineering aspects of controlling quality through the use of statistical methods. Frequency distributions, control charts for variables, control for fraction defective and defects per unit. Sampling inspection plans. Design of specifications; tolerance systems and gaging. Administration of inspection. Prerequisite: Junior classification in engineering.

415. Production Control. (1-3). Credit 2. I †

The planning and control of production; operation analysis; routing; scheduling; dispatching; use of visual production charts and boards; inventory control; accumulation of material requirements; design of production control forms; forecasting production requirements; economic lot size; controls for job order, repetitive cycle, and straight line production. Prerequisite: Industrial Engineering 302, registration in 404.

416. Factory Layout. (1-6). Credit 3. II †

The layout of a complete factory for a selected product. Use of machine templates and models; design of materials handling systems; machine erection; auxiliary services; design of storerooms; loading docks; choice of building types; machine selection; estimate of unit costs; estimate of capital requirements; personnel organization; safety considerations in plant layout. Prerequisites: Industrial Engineering 404, 415.

417. Elements of Time Study. (0-3). Credit 1. I

Deals with the theory and practical application of elementary time and motion study principles. Techniques studied include taking the time study; developing methods improvements through use of process charts, and operation analysis. A time formula is developed and a study is made of the use of standard times in cost determination. Prerequisite: Industrial Engineering 202 or 401.

420. Manufacturing Costs. (3-0). Credit 3. II †

The study of industrial costs, including first costs, operating costs. Returns from investment in new equipment and new plants. Break-even charts, profit graphs, budgeting, control of manufacturing costs, standard cost, machine replacement studies, and cost comparison of alternative methods. Prerequisite: Business Administration 430 or approval of the Head of the Department.

430, 431. Special Problems in Industrial Engineering. Credit 1 to 3 each semester. I, II

Courses which permit work on a special project in industrial engineering. Project must be approved by the Head of the Department. Prerequisite: Senior classification in industrial engineering.

451. Tool Engineering. (2-0). Credit 2. I

Principles of selection and design of tools, jigs, fixtures, and gages. Economic considerations in choice of tooling methods. Estimating tooling costs. Dimensioning and tolerances. Methods of locating, clamping, and feeding. Tool cataloguing, maintenance, and control. Prerequisites: Civil Engineering 305; Industrial Engineering 202, 302.

452. Tool Design Laboratory. (0-3). Credit 1. II

Solution of tool design problems on drawing board. Problems to include drill jig detailing and layout, punch and die design, milling fixture design, turret lathe tooling, and compound angle calculation. Prerequisites: Industrial Engineering 451; Mechanical Engineering 337.

FOR GRADUATES

601. Industrial Surveys. (2-0). Credit 2. II

Engineering problems related to industrial investigations, reports on organizations, personnel, capital equipment, financial policies, market, etc. Prerequisites: Industrial Engineering 415, 416.

602. Incentive for Management and Men. (2-0). Credit 2. II

Direct worker incentives, seasonal bonuses, quality incentives, profit-sharing plans for executives, profit-sharing for wage earners. Prerequisite: Industrial Engineering 412 or the equivalent.

603. Human Relations in Industry. (3-0). Credit 3. I

Causes of misunderstandings between management and labor; interdepartmental relations; conditions which influence the attitudes and productivity of workers; principles of leadership; job analysis for a selected industry; selection, training, follow-up, dismissals; the industrial engineer's relations with shop employees; critical study of current labor-management problems. Prerequisite: Industrial Engineering 412.

604. Advanced Time and Motion Studies. (1-6). Credit 3. I

Deals with applications and refinements of time and motion study; balancing operations in a group or on an assembly line; rate-setting based on formulas and curves; standard cost systems; synthetic times, micromotion studies. Prerequisite: Industrial Engineering 404 or the equivalent in practical time study experience in industry.

608. Industrial Case Analysis. (3-0). Credit 3. II

Practice in the application of principles to the solution of actual case problems involving broad management decisions. Special attention is given to problems indigenous to Texas industry. Prerequisite: Graduate classification in industrial engineering or approval of Head of Department.

614. Advanced Quality Control. (2-3). Credit 3. I

Advanced statistical methods applied to quality control problems; significance of differences; single and multiple correlation; analysis of frequency distribution; sequential sampling; writing of specifications; design of special gages; administration of inspection staff; gage laboratory work in checking gages; keeping charts on actual machine processes. Prerequisites: Graduate classification in engineering; Industrial Engineering 414.

681. Seminar. (2-0). Credit 2. II

Group study and discussion of current developments in industrial engineering practices as reported in the literature and as presented by representatives from industry. Prerequisite: Graduate classification in industrial management or industrial engineering.

691. Research. Credit 1 or more each semester. I, II

Research in the industrial engineering field; subject to meet the needs of the individual student.

Department of Journalism

Professor D. D. Burchard;
Associate Professor H. O. Miller; Assistant Professor D. E. Newsom

201. News Writing. (2-2). Credit 3. I

Beginner's reporting; study of types of news; leads; body treatment of story; feature in lead; facts; background and practice in writing straight news story. Prerequisite: Knowledge of typing.

202. Beginning News Reporting. (2-2). Credit 3. II

Study of news sources; style; interviewing; news analysis and discussion; handling of various types of news; emphasis on clear writing; practical reporting experience. Prerequisite: Knowledge of typing.

205. Principles of Typography. (2-2). Credit 3. II

Effective use of type and printing materials in advertising and editorial production; practice in fundamentals of printing; illustrations and other elements of layout and composition for publications. Prerequisites: Sophomore classification; approval of instructor.

304. Feature Story Writing. (2-2). Credit 3. I

The writing of magazine and feature stories; types of feature articles; sources; titles; markets; slanting articles for particular markets; style; word usage; beginnings; illustrations.

306. Newspaper Production and Management. (2-2). Credit 3. II

The business of managing a newspaper; the community newspaper; study of the weekly and small town daily newspaper as a service organization; social responsibilities; influence of the community; mechanics of printing; managership; business side of conducting a paper. Prerequisites: Journalism 202, 205.

307. News Editing. (2-2). Credit 3. I

The editing of news; makeup of a newspaper; copy reading; proofreading; headline writing. Prerequisite: Journalism 202.

308. Newspaper Advertising. (2-2). Credit 3. I

Advertising layout and copy for newspapers and other publications; intensive practice in newspaper layouts; writing of retail copy; servicing of newspaper accounts. Prerequisite: Approval of instructor.

311. Radio News Writing. (2-2). Credit 3. II, S

A study and analysis of the basic methods of writing for radio with special emphasis on the techniques required in processing news copy for broadcast purposes. Students receive thorough groundwork in the fundamentals of radio news style and intensive practice in re-writing and condensing from original news stories. Prerequisite: Approval of the instructor.

321. Industrial Journalism. (2-2). Credit 3. I, II, S

A study of the technique of writing technical articles and reporting news related to engineering, industry, science, and other specialized interests; preparation of fact articles for technical and trade journals.

406. Publicity and Public Relations. (3-0). Credit 3. II †

Practical analysis of the various fields of publicity and public relations. Students make surveys and perform laboratory work on actual projects. Theory and practice in various aspects of functioning publicity, including news writing, advertising, and radio.

409. History and Principles of Journalism. (3-0). Credit 3. I

Development of American journalism from colonial times to the present, projecting the press as an institution against the background of the economic, social, and political history of the nation. Includes ethics of the profession. Prerequisite: Journalism 202.

412. Editorial Writing. (3-0). Credit 3. II

The writing of editorials; editorial page; editorial campaigns; what constitutes editorial policy; ethics in editorial writing. Prerequisite: Journalism 304.

415. Agricultural Journalism. (2-2). Credit 3. I, II, S

The principles of newspaper writing; especially the preparation of material for agricultural papers and country weeklies; the part a country paper should play in country development; in the laboratory work, opportunity is given for actual writing for newspapers and farm journals. The Information Office of the College and the Information Department of the Extension Service are cooperative in the course.

421. Methods and Problems of Journalism. (0-6). Credit 2. I

Individual work, fitted to the special needs of the specific student as determined by his interests and aptitude. Research problems and projects related to the communications field will be stressed.

422. Methods and Problems of Journalism. (0-6). Credit 2. II

Advanced individual work, fitted to the special needs of the specific student as determined by his interests and aptitude. Research problems and projects related to the communications field will be stressed.

462. School Publications. (3-0). Credit 3. S †

Problems of advising and sponsoring school newspapers and annuals; the school paper as a public relations tool; selecting and training the staff, financing school publications; planning content of a high school journalism course. Prerequisite: Senior classification.

Department of Mathematics

Professor E. C. Klipple,
Professors R. E. Basye, J. A. Daum*, J. T. Hurt, D. C. Jones, H. A. Luther, W. L. Porter; Associate Professors A. E. Finlay, Dan Hall, J. T. Kent, R. V. McGee, B. C. Moore, T. R. Nelson; Assistant Professors J. R. Hillman, E. R. Keown, W. E. Koss**, R. R. Lyle, W. S. McCulley, R. L. Nolen, J. L. Shawn, S. A. Sims, M. E. Tittle; Instructors D. B. Alexander, K. R. Bailey, M. L. Coffman, R. E. Collins, H. B. Curtis, Jr., W. F. Hill**, L. M. Hovorak, J A. Kincannon, C. E. Padgett, A. R. Wapple

100. General Mathematics. (3-0). Credit 3. I, II

Review of fractions, mensuration, percentage, fundamental algebraic operations, signs of aggregation, factoring, formulations of equations, simple equations, systems of linear equations, graphs, exponents, radicals. **No credit toward a degree will be granted for the satisfactory completion of this course.**

101. Algebra. (3-0). Credit 3. I, II, S

Factoring, fractions, linear equations in one unknown, graphs, systems of linear equations, exponents and radicals, quadratic equations.

102. Algebra. (3-0). Credit 3. I, II, S

Quadratic equations, ratio, proportion, variation, progressions, binomial theorem, complex numbers, theory of equations, determinants, partial fractions.

103. Plane Trigonometry. (3-0). Credit 3. I, II, S

Definitions of the trigonometric functions, evaluation of the functions of special angles, fundamental relations, solution of right triangles, trigonometric reductions, angular measure, functions of a composite angle, logarithms, solution of oblique triangles, inverse trigonometric functions, trigonometric equations.

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*Deceased March 23, 1954.
**On leave of absence.

104. Analytics. (3-0). Credit 3. I, II, S

Equation of a locus, locus of an equation, the straight line, circle, parabola, ellipse, hyperbola, transformation of coordinates, polar coordinates, parametric equations, plane, quadric surfaces. Prerequisite: Mathematics 103.

110. Survey Course in Mathematics. (3-0). Credit 3. I, II, S

Linear equations, quadratic equations, functions and graphs, derivatives of polynomials, integrals of polynomials, systems of equations, logarithms, progressions, binomial theorem, compound interest and annuities, permutations and combinations, probability.

116. Plane Trigonometry and Analytics. (4-0). Credit 4. I, II

Trigonometric functions, fundamental relations, solution of right triangles, trigonometric reductions, angular measure, functions of a composite angle, logarithms, solution of oblique triangles, functions and graphs; the straight line, circle, parabola, ellipse, the hyperbola, polar coordinates, sketching of surface. Prerequisite: Mathematics 102. (For students registered in architecture.)

209. Calculus. (3-0). Credit 3. I, II, S

Variables, functions, and limits. Derivatives and differentials for polynomials and applications. Integration of polynomials and applications. Differentiation of algebraic functions. Prerequisite: Mathematics 104.

210. Calculus. (3-0). Credit 3. I, II, S

Differentiation and integration involving transcendental functions together with applications. Improper integrals, approximate integration, indeterminate forms, mean value theorems. Prerequisite: Mathematics 209.

223. Differential and Integral Calculus. (4-0). Credit 4. I, II

Limits, rate of change, the derivative, maxima and minima, differentiation of polynomials; the definite integral; volume, differentiation of implicit functions, special devices for integration, center of gravity, moment of inertia, double integrals. Prerequisite: Mathematics 116. (For students registered in architecture.)

303. Theory of Equations. (3-0). Credit 3. II

Complex numbers, remainder theorem, factor theorem, synthetic division, nature of roots of equation, ruler and compass construction, solution of cubic and quartic equations, isolation of a root, solution of numerical equations, determinants, matrices, systems of linear equations, symmetric functions, elimination, resultants, discriminants. Prerequisite: Mathematics 210.

307. Calculus. (3-0). Credit 3. I, II, S †

Solid analytic geometry, partial differentiation, vectors, multiple integration, infinite series. Prerequisite: Mathematics 210.

308. Differential Equations. (3-0). Credit 3. I, II, S †

Separation of variables and application to problems of physics, exact equations, homogeneous equations, Laplace transforms, linear equations with constant coefficients, applications. Prerequisite: Mathematics 210.

405. Vector Analysis. (3-0). Credit 3. I †

Elementary operations, vector and scalar products of two vectors, vector and scalar products of three vectors, differentiation of vectors, the differential operators, applications to electrical theory, applications to dynamics, mechanics, and hydrodynamics. Prerequisite: Mathematics 210.

409. Advanced Calculus. (3-0). Credit 3. I, S †

The concept of a function, limit of a sequence, continuity, theorems on continuous functions, the definite integral, the derivative, mean value theorems, hyperbolic functions, improper integrals. Prerequisite: Mathematics 210.

410. Advanced Calculus. (3-0). Credit 3. II †

Theory of plane curves, mechanics of a particle, Taylor's theorem and applications, numerical integration, convergence and divergence of series, power series, periodic functions, Fourier Series. Prerequisite: Mathematics 409.

411. Mathematical Probability. (3-0). Credit 3. I †

Introductory concepts, permutations and combinations, elementary principles of the theory of probability, probability of experiment, distribution functions and continuous variables, averages, curve fitting, applications. Prerequisite: Mathematics 210.

414. Mathematical Statistics. (3-0). Credit 3. II †

History and terminology of statistics, probability theory, discrete and continuous distributions, expected values, moments, sampling, confidence intervals, tests of hypotheses. Prerequisite: Mathematics 210.

415. Modern Algebra. (3-0). Credit 3. I †

Integers, rational numbers, real numbers, complex numbers. Groups, rings, integral domains, fields. Polynomials over a field. Prerequisite: Mathematics 210.

FOR GRADUATES

601. Higher Mathematics for Engineers and Physicists. (4-0). Credit 4. I, II, S

Multiple integrals, line integrals, partial differential equations, vector analysis. Prerequisites: Mathematics 307, 308.

602. Higher Mathematics for Engineers and Physicists. (4-0). Credit 4. I, S

Complex variables, Bessel functions, numerical solution of equations, harmonic analysis, empirical formulas and curve fitting. Prerequisite: Mathematics 601.

606. Theory of Probability. (4-0). Credit 4. II

Formulae for combinations and arrangements, problems in total and compound probability, expectation, risk, the problem of repeated trials, Stirling's formula, the probability integral, theorems in mean value, dispersion, determination of best value, the law of error, the correlation coefficient, curve fitting. Prerequisite: Mathematics 411.

607. Theory of Functions of a Real Variable. (4-0). Credit 4. I

Rational numbers, Cantor's theory of irrational numbers, Dedeklind's theory of irrational numbers, infinite aggregates, fundamental operations with point sets, measure of point sets, laws of operations with limits, continuity and discontinuity of a function, derivatives. Prerequisite: Mathematics 409.

608. Theory of Functions of a Real Variable. (4-0). Credit 4. II

Definition of a Riemann integral, functions of bounded variation, properties of infinite integrals, uniform convergence of an infinite integral, repeated integrals, measurable functions, definition of a Lebesgue integral, comparison of Riemann and Lebesgue integrals, other definitions of integration, laws of operation with series, uniform convergence of a series, differentiation and integration of series, power series, divergent series. Prerequisite: Mathematics 607.

611. Ordinary Differential Equations. (4-0). Credit 4. I

Definitions, general methods of solving first order differential equations, singular solutions, geometrical applications, trajectories, motion of a particle, special methods for the equation of the first order, linear equations of the second order, the method of successive approximations, systems of ordinary differential equations, interpolation and numerical integration, symbolic methods, numerical solution of differential equations. Prerequisites: Mathematics 307, 308.

612. Partial Differential Equations. (4-0). Credit 4. II

General solution of first order partial differential equations, solution of second order equations from physics and mechanics by separation of variables, solution of second order equations by Green's functions. Prerequisite: Mathematics 611 or the equivalent.

615. Advanced Algebra. (4-0). Credit 4. I

Polynomials and their most fundamental properties, determinants, linear dependence, linear equations, theorems concerning the rank of a matrix, linear transformations and combinations of matrices, invariants, bilinear forms, quadratic forms, pairs of quadratic forms. Prerequisites: Mathematics 307 and 308, or 409.

616. Advanced Algebra. (4-0). Credit 4. II

Properties of polynomials, factors and common factors of polynomials in one variable and of binary forms, factors of polynomials in two or more variables, integral rational invariants, symmetric polynomials, elementary divisors, the equivalence and classification of pairs of bilinear forms and collineations, equivalence and classification of pairs of quadratic forms. Prerequisite: Mathematics 615.

617. Theory of Functions of a Complex Variable. (4-0). Credit 4. I

Rational numbers, irrational numbers, complex numbers, geometric representation of complex numbers, definition and classification of functions, limits, continuity, differentiation, line-integrals, Green's theorem, integral of f(z), Cauchy-Goursat theorem, Cauchy's integral formula, Cauchy-Reimann differential equations, Laplace's differential equation, mapping with application to elementary functions, linear fractional transformations. Prerequisites: Mathematics 307 and 308, or 409.

618. Theory of Functions of a Complex Variable. (4-0). Credit 4. II

Series with complex terms, operations with series, double series, uniform convergence, integration and differentiation of series, power series, expansion of a function in a power series, analytic continuation, analytic functions, singular points, Laurent's expansion, residues, rational functions, fundamental theorem of algebra, infinite products, periodic functions, multiple-valued functions, Riemann surfaces. Prerequisite: Mathematics 617.

620. Fourier Series and Allied Topics. (4-0). Credit 4. I

Convergence of Fourier series, the cosine series, the sine series, uniform convergence of Fourier series, differentiation and integration of Fourier series, Fourier integrals, Bessel functions. Prerequisite: Mathematics 608.

622. Laplace Transforms. (4-0). Credit 4. II, S

Fundamental theorems concerning Laplace transforms. Applications to ordinary and partial differential equations, difference equations, and integral equations. Prerequisite: Mathematics 601.

623. Higher Mathematics for Chemical Engineers. (4-0). Credit 4. II

Derivation and solution of the differential equations of chemistry and chemical engineering, mathematical theory of distillation, series solutions of differential equations, Bessel functions. Prerequisites: Mathematics 307, 308.

624. Higher Mathematics for Chemical Engineers. (4-0). Credit 4. I

Equations of finite differences, applications of partial differentiation, solution of partial differential equations, Fourier integrals, orthogonal systems, numerical and graphical methods, theory of errors. Prerequisite: Mathematics 623.

625. Matrix Algebra and Tensor Calculus. (4-0). Credit 4. I, II, S

Elementary matrix operations; linear transformations; canonical and modified triangular forms of matrices; inverse of a non-singular matrix; diagonal and rotation matrices; characteristic roots of a matrix; symmetric matrices; tensor concept; covariance and contravariance; algebra of tensors; metric tensors; Christoffel's symbols; covariant differentiation of tensors; applications. Prerequisite: Mathematics 405 or 601.

641, 642. Modern Analysis. (4-0). Credit 4 each semester. I, II

Recent developments in the theory of functions. Prerequisite: Mathematics 608.

685. Problems. Credit 1 to 4 each semester. I, II, S

A course offered to enable students to undertake and complete with credit limited investigations which do not fall within their thesis research and which are not covered by any other courses in the curriculum. Prerequisite: Mathematics 601.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis or dissertation.

Department of Mechanical Engineering

Professor C. W. Crawford,
Professors A. V. Brewer, L. S. O'Bannon, C. M. Simmang, L. P. Thompson, W. I. Truettner, R. M. Wingren; Associate Professors J. H. Caddess, D. W. Fleming, W. S. Guthrie, E. S. Holdredge, W. W. Smith, J. G. H. Thompson; Assistant Professors A. B. Alter, R. W. Downard, R. H. Fletcher, A. M. Gaddis, R. V. Jarvi, A. R. Orr, Warren Rice; Instructors S. E. Brown, R. M. Edminston, R. H. Gibson, E. D. Kranz, J. V. Perry, Jr., H. G. Stallings

101. Engineering Problems. (0-3). Credit 1. II

Use of the slide rule, dimensional equations, solution of problems involving various fields of engineering, trigonometry, and principles of motion. Logical thinking, neatness, and form stressed throughout. Prerequisites: Mathematics 101 or 102, and 103 or 116, or registration therein.

105. Carpentry and Mill Work. (1-6). Credit 3. I

This course is designed for freshman architectural students and for business administration freshmen taking building products marketing. The course includes simple building constructions such as framing, roof construction, general carpentry work, exterior and interior finishing, forms, working drawings, and mill work including the use of machines, hand tools, safety, and built-in cabinet constructions in the home.

106. Cabinet Making. (1-6). Credit 3. II, S

Design, rod making, construction, and finishing of furniture; glues, varnishes, lacquers, and other finishing materials; production methods; care and maintenance of woodworking machinery.

108. Engineering Problems. (2-3). Credit 3. I, II, S

A practical problems course involving a study of the slide rule, dimensional consistency, significant figures, motion and Newton's Laws, including a brief treatment of work energy and power. Prerequisites: Mathematics 102, 103.

201. Welding and Foundry. (0-3). Credit 1. I

Simple pattern layouts and construction of patterns; pattern storage; costs and weights of patterns and castings; kiln-drying and moisture content of pattern woods; the patternmaking industry. Cupolas; gas fired furnaces, moulding sands; core-making; foundry layouts; and practice in moulding and casting both ferrous and non-ferrous metals. Welding materials and equipment, demonstration and practices in Heliarc, Atomic-hydrogen, metallic arc, electrical resistance, and oxy-acetylene.

202. Welding and Foundry. (0-3). Credit 1. II

A continuation of Mechanical Engineering 201, including advanced methods of patternmaking, moulding, and weld inspection and testing, fundamentals of joint design and metallography.

212. Engineering Mechanics. (3-0). Credit 3. I, II, S

Forces and couples, force systems, resultants, components, equilibrium, frame structures, center of gravity, and moment of inertia. Prerequisites: Mathematics 210 or registration therein; Mechanical Engineering 108.

220. Engineering Mechanics. (4-0). Credit 4. I

The principles of mechanics as related to both statics and kinetics. A condensation of the material in Mechanical Engineering 212 and 313. Prerequisites: Mathematics 210 or registration therein; Mechanical Engineering 108.

309. Machine Shop. (0-3). Credit 1. I, II, S

Lecture demonstrations and practice in safety, care of machines and hand tools, shop organization, cutting speeds and feeds, standard machine tool work in metals, single point tool grinding, layout, drilling, tapping, shaping, turning, boring, threading, and milling.

310. Machine Shop. (0-3). Credit 1. II, S

A continuation of Mechanical Engineering 309. Machining of metals with both standard and production machine tools. Manufacture of interchangeable parts, jigs, fixtures, and fixed gages. Prerequisite: Mechanical Engineering 309.

313. Engineering Mechanics. (3-0). Credit 3. I, II, S

A continuation of Mechanical Engineering 212, including kinematics, both graphical and algebraic solutions of relative linear velocities and accelerations, kinetics, dynamics of translation and rotation, work, energy, impact, momentum, and balancing. Prerequisite: Mechanical Engineering 212.

323. Thermodynamics. (4-0). Credit 4. I, II, S

The thermodynamics of perfect gases, including non-flow and steady-flow processes; internal combustion engines; gas compressors; combustion; vapors and vapor mixtures, boilers, and vapor cycles. Prerequisites: Mathematics 210; Physics 204.

327. Thermodynamics. (3-0). Credit 3. I

The thermodynamics of gases, vapors, and liquids in various non-flow and steady-flow processes; internal combustion engines; gas compressors; power plant equipment. Prerequisites: Mathematics 210; Physics 204.

328. Thermodynamics. (3-0). Credit 3. II

A continuation of Mechanical Engineering 327, covering gas mixtures, variable specific heats, turbines, modern power plant cycles, refrigeration; air conditioning, heat transfer. Prerequisite: Mechanical Engineering 327.

329. Advanced Cabinet Making. (1-6). Credit 3. II, S

Cabinet and furniture design, estimating, detailing, rod making, construction and finishing. A major project is to be constructed from a set of drawings and details made by the student. A term paper is required on some related subject, such as design, finishing, safety, production methods, etc. Prerequisite: Mechanical Engineering 105 or 106, or equivalent experience.

335. Mechanical Equipment of Buildings. (3-0). Credit 3. I, II

The mechanical equipment of buildings; heating and ventilating; air conditioning; plumbing, water supply, working methods of design arranged especially for architectural students.

337. Kinematic Drawing. (0-3). Credit 1. I

Problems and drafting involving linkages, centros, relative linear velocities, cams and gears. Designed especially to supplement the kinematics of motion included in the course of dynamics for electrical engineers. Prerequisite: Mechanical Engineering 313 or registration therein.

338. Kinematics and Machine Design. (2-3). Credit 3. II

A study of instantaneous centers, velocities, and accelerations, followed by the design of cams and an introduction to elementary stress analysis. Must be preceded or accompanied by Civil Engineering 305 and Mechanical Engineering 313.

344. Fluid Mechanics. (3-0). Credit 3. I, II

Application of the laws of statics, buoyancy, stability, energy, and momentum to the behavior of ideal and real fluids. A study of dimensional analysis and similitude and their application to flow through ducts and piping, dynamic lift and related problems. Prerequisites: Mechanical Engineering 313, and 323 or 327.

403. Engineering Laboratory. (1-3). Credit 2. I, II, S

Study and testing of instruments used in laboratory work and simple tests of engines and pumps. Calculations and written reports on the investigations and results obtained. Prerequisite: Mechanical Engineering 323 or 327.

404. Engineering Laboratory. (1-3). Credit 2. II, S

A continuation of Mechanical Engineering 403 with more advanced work in testing of steam and internal combustion engines, turbines, boilers, fans, and refrigeration machinery. Prerequisite: Mechanical Engineering 403.

407. Mechanical Refrigeration. (3-0). Credit 3. II †

The application of the principles of thermodynamics to mechanical refrigeration. The equipment and methods of practical production of refrigeration, ice making, and cold storage. Prerequisite: Mechanical Engineering 323 or 327.

410. Internal Combustion Engines. (3-0). Credit 3. I, II †

Thermodynamics of cycles for internal combustion engines and gas turbines. Fuels, combustion, and knock testing. Performance characteristics of various types of engines. Prerequisite: Mechanical Engineering 323 or 327.

412. Advanced Problems in Mechanical Engineering. Credit 2 to 5. I, II †

Special problems in the various phases of mechanical engineering are assigned to individual students or to groups. Readings are assigned, and frequently consultations are held. Prerequisites: By permission and senior classification in mechanical engineering.

414. Steam and Gas Turbines. (2-3). Credit 3. II †

A study of the theory of turbines, turbine thermodynamics, gas path design; effect on economy of superheat, vacuum, high pressure, and special cycles. Prerequisite: Mechanical Engineering 328.

417. Power Engineering. (4-0). Credit 4. I, S

The application, operation, and performance of all types of power plant equipment. The selection and arrangement of such equipment from the standpoint of economics. Prerequisites: Mechanical Engineering 328, 344 or registration therein.

432. Automotive Engineering. (3-0). Credit 3. II

The modern automobile, its power plant, fuels, performance, vibration, dynamic balancing, electrical equipment, braking systems, construction, etc., from an engineering standpoint. Prerequisites: Mechanical Engineering 313, and 323 or 327.

436. Heating, Ventilating, and Air Conditioning. (3-0). Credit 3. II. †

The thermodynamics of heating, cooling, and conditioning of air of residence, office, and factory. The calculations for and selections of heating, ventilating, and air conditioning equipment, piping, and duct layouts. Prerequisite: Mechanical Engineering 323 for non-mechanical engineering majors, 328 for mechanical engineering majors.

440. Physical Metallurgy. (2-3). Credit 3. II, S †

The fundamentals of the physical metallurgy of irons, steels, and their alloys; precipitation hardening and corrosion resistance of non-ferrous alloys: laboratory work in polishing, etching, and preparation of specimens, making and studying photomicrographs. Prerequisite: Junior classification.

445. Machine Design. (2-3). Credit 3. I †

The theory and practice of machine design applied to various machine parts, such as columns, screws, shafts (considering combined stresses), bearings, brakes, springs, and complete machines. Prerequisite: Mechanical Engineering 338.

446. Machine Design. (2-3). Credit 3. II, S †

The theory and practice of machine design applied to problems encountered in transmission of power by means of belts, ropes, chains, and gears. Prerequisite: Mechanical Engineering 338.

449. Seminar. (0-2). Credit 1. I

Oral presentation of selected topics from current literature of the field. Technical films showing practical application of theories of engineering and manufacturing processes. Prerequisite: Senior classification.

450. Seminar. (0-2). Credit 1. II

A continuation of Mechanical Engineering 449 but with more extensive reports and with lectures from visitors. Prerequisite: Senior classification.

455. Applied Welding Technology. (2-3). Credit 3. II

A course in welding technology, covering materials and equipment, testing and inspecting, and fundamental factors of welding design.

457. Engineering Analysis. (3-0). Credit 3. I

Mathematical and experimental methods of solving problems in the various fields of engineering. Dimensional analysis, representation and analysis of experimental data, graphical and numerical solution of differential equations, analogies and computers. Prerequisites: Mathematics 308; senior classification in engineering.

459. Mechanical Vibration. (3-0). Credit 3. I

The basic theory of vibrating systems with single and multiple degrees of freedom and the principles of transmission and isolation of vibrations. Prerequisites: Mathematics 308; Mechanical Engineering 313.

FOR GRADUATES

601. Advanced Machine Design. (4-0). Credit 4. I

A study of combined stresses and theories of failure, statically indeterminate structures, piping design, flat plates, curved beams, and the theory of lubrication. Prerequisites: Mathematics 307 and 308 or registration therein.

603. Power Plants. (2-6). Credit 4. II

The design of central and isolated power plants with special attention to over-all economic operation. Prerequisite: Mechanical Engineering 417.

605. Engineering Analysis. (4-0). Credit 4. I

A study of analytical, graphical, and approximate methods of solving problems common to engineering; dimensional analysis and model study; design of experiments; statistical analysis and interpretation of test data including derivation of empirical equations. Prerequisites: Mathematics 307 and 308 or registration therein.

613. Kinematics and Dynamics of Machines. (4-0). Credit 4. II

The use of the vectorial approach to velocities, accelerations, and dynamics; the virtual work principle, Legrange's and Euler's equations of motion, and Hamilton's principle applied to engineering problems. Prerequisites: Mathematics 307, 308.

615. Advanced Engineering Thermodynamics. (4-0). Credit 4. I

The theories of thermodynamics and their application to the more involved problems in engineering practice. Prerequisite: Mechanical Engineering 328.

616. Heat Transmission. (4-0). Credit 4. II

The fundamental laws relating to heat flow, the application of these laws to engineering materials used in various industrial processes; a study of recent developments by reference to current literature. Prerequisites: Mathematics 307, 308.

617. Mechanical Vibrations. (4-0). Credit 4. I

The theory of vibrations of machines and structures. Prerequisites: Mathematics 307, 308; Mechanical Engineering 313.

618. Advanced Air Conditioning. (2-6). Credit 4. II

Thermodynamics of air vapor mixtures applied to problems of air conditioning. Practice in design and selection of equipment with emphasis on the preparation of plans and specifications. Prerequisite: Mechanical Engineering 436.

619. Theoretical Methods of Machine Design. (4-0). Credit 4. II

Applications of the theory of elasticity to machine design. Study of compatability equations, stress functions, energy methods, etc. Prerequisites: Mathematics 601 or registration therein; Mechanical Engineering 601.

620. Experimental Methods of Machine Design. (3-3). Credit 4. II

Use of experimental methods in machine design. Study of photoelasticity, electric strain gauges, stresscoat, etc. Prerequisites: Mathematics 307 and 308 or registration therein; Mechanical Engineering 601 or registration therein.

621. Turbomachinery. (4-0). Credit 4. II

A study of flow problems encountered in the design of water, gas, and steam turbines; centrifugal and axial-flow pumps and compressors. Prerequisites: Mathematics 307, 308; Mechanical Engineering 344.

640. Ferrous Metallurgical Design. (3-3). Credit 4. II

A detailed study of the phase transformations in steel, the resulting changes in mechanical properties, the peculiarities of the steels, and their influence upon the design of machine elements. Prerequisite: Mechanical Engineering 440.

685. Problems. Credit 1 to 4 each semester. I, II

The content will be adapted to the interest and needs of the group enrolled.

691. Research. Credit 1 or more each semester. I, II, S

Methods and practice in mechanical engineering research for thesis or dissertation.

Department of Military Science and Tactics

S. P. Myers, Jr., Colonel, Artillery, USA, Professor of Military Science and Tactics

UNITED STATES ARMY

Associate Professors: Colonel E. F. Sauer; Lieutenant Colonels W. R. Herdener, W. U. Kennon, D. F. McGee, H. L. Phillips; Majors J. F. Birkner, C. H. Brown, J. W. Davis, E. W. Emerson, C. P. Parrish, C. C. Waddell, R. T. Willets, W. J. Winder, E. C. Wright; Assistant Professors: Captains F. J. Bloom, A. A. Hord, S. L. James, T. H. Libby, W. R. McNeil, H. S. Thigpen; Chief Warrant Officer C. L. Brown; Instructors: Master Sergeants L. L. Adams, J. G. Boling, Jr., E. R. Clower, A. L. Crowder, Jr., D. R. Dunphy, J. G. Haverstick, Jr., T. I. Hensley, W. D. Holt, C. C. Lentz, A. M. Linton, F. A. Monsees, C. B. Sexton, L. F. Stewart, R. M. Temple; Sergeants First Class C. W. Callender, J. K. Duncan, R. C. Dunn, R. E. Green, Albert Horner, Jr., W. R. Huff, F. R. Olsen, H. L. Reynolds, F. E. Silence; Sergeants J. F. Cadwell, C. E. Cathey, R. G. Cox, R. C. Guinessey, E. J. Hays, S. O. Lucky, J. P. Owens

Basic Course of Military Science

All students are required, unless excused by proper authority, to take the first and second year basic military or air science.

121. First Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Military organization; hygiene and first aid; maps and aerial photographs; National Defense Act and ROTC; evolution of warfare; military problems of the United States; mobilization and demobilization.
Practical: Leadership, drill, exercise of command; individual weapons and marksmanship.

122. First Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 121.

INFANTRY

201. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Organization; weapons; marksmanship; technique of fire of rifle squad; combat formations; scouting and patrolling; tactics of rifle squad.
Practical: Leadership, drill, and exercise of command.

202. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 201.

301. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Organization; weapons, gunnery; communications; combat intelligence; estimate of situation and combat orders; field fortifications; tactics of rifle and heavy weapons platoons and companies.
Practical: Leadership, drill, and exercise of command.

302. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 301.

401. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Organization; command and staff; communications; motors and transportation; supply and evacuation; troop movement; new developments; the military team; tactics — infantry battalion in attack and defense.
Practical: Leadership, drill, and exercise of command.

402. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 401.

FIELD ARTILLERY

203. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Field artillery organization; materiel; service of the piece; instruments; communications; motors and transportation.
Practical: Leadership, drill, and exercise of command.

204. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 203.

303. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Communications; duties of battery executive; field artillery tactics; surveying; basic and intermediate gunnery.
Practical: Leadership, drill, and exercise of command.

304. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 303.

403. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Advanced gunnery and surveying; field artillery tactics, advanced, command and staff; combat intelligence; military team; new developments; supply and evacuation.
Practical: Leadership, drill, and exercise of command.

404. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 403.

SIGNAL CORPS

205. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Introduction to signal communications; organization and missions of signal corps; organization and signal communications practices of infantry; armored and airborne divisions.
Practical: Leadership, drill, and exercise of command.

206. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 205.

305. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Communications security; signal orders; field wire communication fundamentals; field radio communication fundamentals; applied signal communication (division); message center and communication center procedure; signal supply and repair; career guidance program for signal corps officers; weapons and marksmanship.
Practical: Leadership, drill, and exercise of command.

306. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 305.

405. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Wire communication—materiel; radio communication—materiel; higher echelon signal communication and equipment; post signal operations and administrative procedure; career guidance plan for signal corps officers; darkroom technique and photographic practices; command and staff; combat intelligence.
Practical: Leadership, drill, and exercise of command.

406. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 405.

ARMOR

207. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Basic communications; basic motors; history and missions of armored cavalry; mechanical training with tank weapons; scouting and patrolling; weapons.
Practical: Leadership, drill, and exercise of command.

208. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 207.

307. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Communications; gunnery; motors; organization; tactics; tank driving; troop leading.
Practical: Leadership, drill, and exercise of command.

308. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 307.

407. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Combat intelligence; communications; gunnery; motors; new developments; supply and evacuation; tactics; tank driving.
Practical: Leadership, drill, and exercise of command.

408. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 407.

CORPS OF ENGINEERS

211. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: History and traditions of corps of engineers; characteristics of weapons; camouflage; defense against chemicals; explosives and demolitions; hand tools and rigging; mines and booby traps; organization and tactics of small units; organization of the ground and field fortifications.
Practical: Leadership, drill, and exercise of command.

212. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 211.

311. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Bridge design and classification; engineer signal communications; engineer combat intelligence; engineer supply; military roads and runways; organizations of engineer units; organization of combat divisions; tactics of engineer units; vehicle operation and maintenance; water supply; individual weapons and marksmanship.
Practical: Leadership, drill, and exercise of command.

312. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 311.

411. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Engineer support for the air force; engineer support for the communication zone; engineer support for the type field army; command and staff; construction; utilities, and job management; motor movements; river crossing operations.
Practical: Leadership, drill, and exercise of command.

412. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 411.

ANTIAIRCRAFT ARTILLERY

213. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Introduction to antiaircraft artillery automatic weapons; characteristics, capabilities, and limitations of antiaircraft artillery automatic weapons; service of the piece—automatic weapons fire unit; introduction to antiaircraft artillery guns; characteristics, capabilities, and limitations of 90-mm antiaircraft artillery guns; service of the piece—90-mm antiaircraft artillery guns.
Practical: Leadership, drill, and exercise of command.

214. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 213.

313. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Antiaircraft artillery tactics; basic gunnery (antiaircraft guns); basic gunnery (automatic weapons); communications; individual weapons and marksmanship; motors and transportation; organization; troop movements.
Practical: Leadership, drill, and exercise of command.

314. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 313.

413. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Antiaircraft artillery materiel; antiaircraft artillery tactics, advanced; command and staff; combat intelligence; gunnery; military team; new developments; supply and evacuation; field artillery capabilities and employment (familiarization).
Practical: Leadership, drill, and exercise of command.

414. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 413.

CHEMICAL CORPS

215. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Organization and function of chemical corps and chemical corps units; chemical agents; protection, individual; chemical corps materiel; field behavior of chemical agents; chemical corps in World War II.
Practical: Leadership, drill, and exercise of command.

216. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 215.

315. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Individual weapons and marksmanship; motor vehicles; tactical employment of chemicals; decontamination; protection, employment of chemical corps units; 4.2-inch mortar gunnery; signal communications; chemical combat intelligence; M-2 smoke generator operation.
Practical: Leadership, drill, and exercise of command.

316. First Year Advanced Military Science. (2-3). Credit 3. II
A continuation of Military Science 315.

415. Second Year Advanced Military Science. (2-3). Credit 3. I
Theoretical: Chemical corps materiel; logistics and field service; organization and function of chemical staff section; duties of chemical staff officers; protection (tactical); operation and training.
Practical: Leadership, drill, and exercise of command.

416. Second Year Advanced Military Science. (2-3). Credit 3. II
A continuation of Military Science 415.

QUARTERMASTER CORPS

217. Second Year Basic Military Science. (0-3). Credit 1. I
Theoretical: Organization for supply in the army; organization and functions of quartermaster corps; classification of supplies, use of supply catalogues and bases of allowances; property accountability and responsibility; research and development of supplies in quartermaster corps; organization functions, and operation of quartermaster units; unit and organizational supply.
Practical: Leadership, drill, and exercise of command.

218. Second Year Basic Military Science. (0-3). Credit 1. II
A continuation of Military Science 217.

317. First Year Advanced Military Science. (2-3). Credit 3. I
Theoretical: Station supply; depot supply; storage, warehousing, and materials handling; procurement, storage and distribution of petroleum products; commissary operations; garrison and field bakery operations; post and field laundry operations; salvage operation and procedures; maintenance and reclamation of quartermaster supplies; graves registration and mortuary activities; food service activities; individual weapons and marksmanship.
Practical: Leadership, drill, and exercise of command.

318. First Year Advanced Military Science. (2-3). Credit 3. II
A continuation of Military Science 317.

417. Second Year Advanced Military Science. (2-3). Credit 3. I
Theoretical: Fiscal procedures; procurement procedures; command staff; combat intelligence; technical intelligence; organization and functions of the combatant arms; organization and functions of the technical services; quartermaster operations in the zone of interior; quartermaster operations in the theater of operation.
Practical: Leadership, drill, and exercise of command.

418. Second Year Advanced Military Science. (2-3). Credit 3. II
A continuation of Military Science 417.

ORDNANCE DEPARTMENT

219. Second Year Basic Military Science. (0-3). Credit 1. I
Theoretical: The role of ordnance; automotive materiel; small arms materiel; ammunition materiel; artillery materiel; fire control materiel.
Practical: Leadership, drill, and exercise of command.

220. Second Year Basic Military Science. (0-3). Credit 1. II
A continuation of Military Science 219.

319. First Year Advanced Military Science. (2-3). Credit 3. I
Theoretical: Functional organization of ordnance department; automotive materiel; small arms materiel; ammunition materiel; ammunition supply; artillery materiel; fire control materiel; individual weapons and marksmanship.
Practical: Leadership, drill, and exercise of command.

320. First Year Advanced Military Science. (2-3). Credit 3. II
A continuation of Military Science 319.

419. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Maintenance and supply; command and staff, combat intelligence; materiel specialty.
Practical: Leadership, drill, and exercise of command.

420. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 419.

TRANSPORTATION CORPS

253. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: Introduction to transportation corps; economics of military transportation; military highway transport; highway organization and operation.
Practical: Leadership, drill, and exercise of command.

254. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 253.

353. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Organization of the transportation staff sections; organization and operation of railroads (zone of interior); military railway service; movements; port operations (ports of embarkation and debarkation); stevedore operations; harbor craft and marine maintenance; highway transport service organization (theater of operations); individual weapons and marksmanship.
Practical: Leadership, drill, and exercise of command.

354. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 353.

453. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Military railway service (theater of operations); highway transport operations (theater of operation); highway traffic regulations and control (theater of operations); movements control (theater of operations); logistics; overseas supply; command and staff; combat intelligence; responsibilities of a transportation corps officer.
Practical: Leadership, drill, and exercise of command.

454. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 453.

ARMY SECURITY AGENCY

255. Second Year Basic Military Science. (0-3). Credit 1. I

Theoretical: History, organization and functions of the Army Security Agency, means of signal communication, basic cryptography, military cryptosystems, communication security, accounting and distribution of cryptomaterial.
Practical: Leadership, drill, and exercise of command.

256. Second Year Basic Military Science. (0-3). Credit 1. II

A continuation of Military Science 255.

355. First Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Individual weapons and marksmanship; radio intercept and direction finding; theory and application of traffic analysis, elementary cryptanalysis.
Practical: Leadership, drill, and exercise of command.

356. First Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 355.

455. Second Year Advanced Military Science. (2-3). Credit 3. I

Theoretical: Command and staff; combat intelligence; elementary cryptanalysis; theory and application of traffic analysis; accounting and distribution of cryptomaterial.
Practical: Leadership, drill, and exercise of command.

456. Second Year Advanced Military Science. (2-3). Credit 3. II

A continuation of Military Science 455.

Department of Modern Languages

Professor J. J. Woolket,
Professor J. M. Skrivanek; Associate Professor J. A. Dabbs; Assistant Professors E. C. Breitenkamp, E. M. Stack

Foreign languages, in addition to their unquestioned cultural value, have a utilitarian value of great importance for those expecting to engage in research or purely practical pursuits. It is, therefore, advisable, when possible, for students to take up such a language during their undergraduate studies and thereby have the use of it when they begin advanced work in agriculture, engineering, or in pure science. Otherwise, as often happens, their specialization may be hampered or delayed.

101. Beginning French. (3-0). Credit 3. I

Study of standard elementary grammar with emphasis on modern usage; elementary readings begun at mid-semester; early attention given to background for conversation; tape recorder and phonograph recordings available for collateral training.

102. Beginning French. (3-0). Credit 3. II

Continuation of Modern Language 101 with completion of study of elements of grammar; extensive reading of elementary texts with written and oral exercises designed to develop conversational ability. Oral-aural equipment available for laboratory practice.

103. Beginning German. (3-0). Credit 3. I, II

Study of standard elementary grammar with emphasis on modern usage; elementary readings begun at mid-semester; early attention given to background for conversation; tape recorder and phonograph recordings available for collateral training.

104. Beginning German. (3-0). Credit 3. II, S

Continuation of Modern Language 103 with completion of study of elements of grammar; extensive reading of elementary texts with written and oral exercises designed to develop conversational ability. Oral-aural equipment available for laboratory practice.

105. Beginning Spanish. (3-0). Credit 3. I, II

For students who have had no previous training in Spanish. Study of standard elementary grammar with oral, written, and reading exercises; early attention given to background for conversation. Tape recorder and phonograph recordings available for collateral training. On completion of course the student should have a 500-word active vocabulary; he should be capable of easy conversation and be able to read simple texts.

106. Beginning Spanish. (3-0). Credit 3. I, II

Continuation of Modern Language 105. Extensive reading of easy texts with written and oral exercises and grammar review. Oral exercises designed to develop conversational ability. On completion of the course the student should have an active vocabulary of 900 words and passive vocabulary of about 1300.

109. Beginning Russian. (3-0). Credit 3. I

Study of standard elementary grammar with oral, written, and reading exercises; early attention given to background for conversation. Tape recorder and recordings of native speakers available for collateral training.

110. Beginning Russian. (3-0). Credit 3. II

Continuation of Modern Language 109 with completion of study of elements of grammar; oral exercises designed to develop conversational ability; continued use of oral-aural laboratory equipment.

127. Beginning Czech. (3-0). Credit 3. I

Study of standard elementary grammar with oral, written, and reading exercises; tape recorder to check each student's pronunciation and conversational progress.

128. Beginning Czech. (3-0). Credit 3. II

Continuation of Modern Language 127 with oral exercises designed to develop conversational ability.

201. Intermediate French. (3-0). Credit 3. I

Introduction to French readings of average difficulty, principally through short stories and selections from longer works. Review of grammar; composition; practice in conversation. Prerequisite: Modern Language 102 or equivalent.

202. Intermediate French. (3-0). Credit 3. II

Continuation of Modern Language 201 with increased conversational material. Some scientific selections included in class readings; collateral readings and reports. (Scientific or technical students may be assigned outside reading in their respective fields if they so request.)

203. Intermediate German. (3-0). Credit 3. I

Introduction to German readings of average difficulty, principally through short stories and selections from longer works. Review of grammar; composition; practice in conversation. Prerequisite: Modern Language 104 or equivalent.

204. Intermediate German. (3-0). Credit 3. II

Continuation of Modern Language 203 with increased conversational material. Some scientific selections included in class readings; collateral readings and reports. (Scientific or technical students may be assigned outside reading in their respective fields if they so request.)

205. Intermediate Spanish. (3-0). Credit 3. I, II

Rapid review of Spanish language structure, followed by reading of standard literary works on the 2,000-word vocabulary level. Supplemental written and oral exercises designed to develop self-expression and recognition ability. Prerequisite: Modern Language 106 or two years of high school Spanish.

206. Intermediate Spanish. (3-0). Credit 3. II

Continuation of Modern Language 205. Reading of standard literary works on the 2,000, the 2,750, and the 3,000-word level. Extensive written and oral work, translation and original aimed at fixing correct grammatical usage and ease of self-expression. Partly conducted in Spanish. On completion of the course the student should have the basic ability to understand and speak standard Spanish and, with a dictionary, to read any modern text.

209. Intermediate Russian. (3-0). Credit 3. I

Review of grammar; reading of selected articles based on everyday subjects; supplementary material to develop self-expression and recognition ability. Prerequisite: Modern Language 110 or two admission units in Russian.

210. Intermediate Russian. (3-0). Credit 3. II

Continuation of Modern Language 209. Emphasis upon Lermontov's **Taman**, Pushkin's **The Stationmaster**, **A Shot**, and others.

227. Intermediate Czech. (3-0). Credit 3. I

Review of grammar; reading of literature in the Czech language. Prerequisites: Modern Language 128 or two entrance units in Czech.

228. Intermediate Czech. (3-0). Credit 3. II

Continuation of Modern Language 227 with emphasis upon the works of Alois Jiresek, Svatopluk Cech, Karel Jaromir Erben, and others. Prerequisite: Modern Language 227.

305. Modern Spanish-American Drama. (3-0). Credit 3. I

A study of representative plays by such Spanish-American dramatists as Florencio Sanchez, Martinez Cuitiño, Bustillo Oro, Rodolfo Usigli, and others. (The dramatists studied will vary depending on their contribution to the Spanish-American theater.) An effort is made to obtain an understanding of the economic, social, and intellectual background of the Spanish-American republics. The course is conducted largely in Spanish, and short written reports in Spanish are required as part of the daily assignment. In addition, term papers in Spanish are required on assigned collateral reading. Prerequisite: Modern Language 206 or the equivalent. (Offered in 1955-56 and in alternate years thereafter.)

306. Modern Spanish-American Drama. (3-0). Credit 3. II

Continuation of Modern Language 305. However, the authors and plays studied will differ from those offered in Modern Language 305. Prerequisite: Modern Language 206 or the equivalent. (Offered in 1955-56 and in alternate years thereafter.)

325. Public Speaking in Spanish. (1-2). Credit 2. I, S

Training in the preparation and delivery of talks in Spanish. Students are required to prepare and deliver a three-minute talk in Spanish once a week, and to conduct a question-answer period of three minutes on their talk. These talks are based on subjects dealing with the student's professional field and on those dealing with Spanish-America. The talks are recorded, and individual weekly interviews are scheduled for analysis of the recording with reference to pronunciation, diction, and syntax. Prerequisite: Completion of any 300 course in Spanish, or approval of Head of Department.

326. Public Speaking in Spanish. (1-2). Credit 2. II

Continuation of Modern Language 325 with round-table discussions. Prerequisite: Completion of any 300 course in Spanish, or approval of Head of Department.

335. Spanish-American Novel. (3-0). Credit 3. I

A study of the most important works of some distinguished contemporary Spanish-American novelists. (The list will vary but will be chosen from such writers as Güiraldes, Azuela, Gallegos, Lopez y Fuentes, Guzmán, Pietri, etc.) The course is conducted largely in Spanish, and short written reports in Spanish are required as part of the daily assignment. In addition, term papers in Spanish are required on assigned collateral reading. Prerequisite: Modern Language 206 or the equivalent. (Offered in 1954-55 and in alternate years thereafter.)

336. Spanish-American Novel. (3-0). Credit 3. II

Continuation of Modern Language 335. However, the authors and novels studied will differ from those offered in Modern Language 335. Prerequisite: Modern Language 206 or the equivalent. (Offered in 1954-55 and in alternate years thereafter.)

401. Introduction to Scientific French. (3-0). Credit 3. II

This course is designed to assist the graduate student to prepare himself to read scientific material with sufficient adequacy to pass the foreign language examination requirement for the Doctor of Philosophy degree. Grammar and syntax will be presented by units. Technical vocabulary and translation ability will be developed by the study of sample reading material in the fields of the various sciences.

403. Introduction to Scientific German. (3-0). Credit 3. S

This course is designed to assist the graduate student to prepare himself to read scientific material with sufficient adequacy to pass the foreign language examination requirement for the Doctor of Philosophy degree. Grammar and syntax will be presented by units. Technical vocabulary and translation ability will be developed by the study of sample reading material in the fields of the various sciences.

404. Readings in Scientific German. (1-2). Credit 2. S

Continuation of Modern Language 403. Study of more involved grammatical difficulties; vocabulary building; theory hour devoted to translation from reader of scientific articles; laboratory hours assigned to prepared individual translations in student's own field with class discussion. Satisfactory completion of course will satisfy foreign language reading requirement for the Ph.D. degree. Prerequisite: Modern Language 403 or approval of the Head of the Department.

Department of Oceanography

Professor D. F. Leipper,
Professors J. G. Mackin, W. A. Price; Associate Professors R. O. Reid, B. W. Wilson; Assistant Professors J. P. Barlow, J. C. Freeman, Jr., A. H. Glaser, D. W. Hood, G. H. Jung, A. M. Kahan, W. J. Saucier; Instructor W. P. Elliott

Oceanography is the study of the oceans and their boundaries. It is based upon the unity of the sciences of the sea. Effective study of the subject requires thorough previous training in one of the pertinent basic sciences such as biology, chemistry, geology, mathematics, meteorology, physics, or in engineering. Therefore, much of the work in oceanography is conducted at the graduate level, and the undergraduate program of students who wish to study oceanography must be planned to satisfy certain prerequisite requirements. It is suggested that such students consult regularly during their undergraduate years with the oceanography staff.

Five options, the biological, chemical, geological, physical, and meteorological with their corresponding engineering phases, are offered.

The options require different undergraduate programs. These programs are taken in other departments except in the case of meteorological oceanography, where a complete undergraduate program in meteorology is offered in the Oceanography Department.

In the graduate program there are curricula leading to the Master of Science and Doctor of Philosophy degrees in each of the five options in oceanography. Specific prerequisite requirements are set up for each curriculum. In general, these consist of the courses normally required for the degree of Bachelor of Science in one of the basic fields listed above and some course work in each of the other fields.

Oceanography may be utilized in solving certain problems arising in fisheries work, offshore oil and gas operations, navigation, prevention of beach erosion, weather forecasting, recreation, extraction of raw materials from the sea, marine construction, coastal sanitation, military operations, fresh water supply, and many other activities. It requires broad interests, numerous skills, a real liking for the sea, and an adaptability to shipboard life.

201. Sea and Air Sciences. (1-0). Credit 1. I, II, S

Oceanography and meteorology as scientific career fields. Features of the natural environment which affect man's daily life and activities. A survey course open to all college students.

317. Meteorological Instruments, Observations, and Communications. (2-3). Credit 3. I

Theory, design, and accuracy of standard meteorological instruments; surface weather observation; weather codes and symbols; global and local weather networks; methods and forms of data transmission; plotting of synoptic weather data; elementary data analysis. Prerequisites: Mathematics 209; Physics 203. For a one-semester general course in meteorology, see Geography 306.

318. Meteorological Instruments, Observations, and Communications. (1-3). Credit 2. II

Methods and instruments for aerological observation, including the theory and limitations of pilot balloon, radiosonde, rawin and radar observations; computation, coding, and plotting of data. Forms of data representation; meteorological charts and diagrams; techniques of data analysis. Prerequisite: Oceanography 335.

325. Physical Climatology. (3-0). Credit 3. I

The horizontal, vertical, and seasonal distributions of climatic elements, stressing the effect of physical properties and processes of the atmosphere; physiography, and ocean currents. Radiation balance of the atmosphere, the general circulation; introduction to air masses and fronts, and microclimatology. Prerequisite: Physics 203. For a one-semester general course in climatology, see Geography 310.

326. Regional Climatology. (2-0). Credit 2. II

Climatic types and zones, with the physical reasons for climatic differences; climates of the continents and oceans, with greatest emphasis on regions adjacent to the Gulf of Mexico. Microclimatology over land and sea; aeroclimatology; tropical and polar climatology. Prerequisites: Oceanography 325, 335.

335. Atmospheric Statics and Thermodynamics. (3-0). Credit 3. I

Geopotential; chemical composition of the atmosphere; the physical variables; the hydrostatic equation; hypsometry; thermodynamics of dry, moist, and saturated air; mixing and convection; thermodynamic charts and diagrams; thermodynamics applied to atmospheric analysis and weather processes. Prerequisites: Mathematics 210; Physics 203.

336. Atmospheric Motions. (3-3). Credit 4. II

Conservation equations; kinematics; equations of motion; geostrophic and accelerated motions; streamlines; trajectories; circulation and vorticity theorem; dynamics of wind systems and stratified media; theories of the general circulation. Prerequisites: Mathematics 307; Oceanography 335.

401. Introduction to Oceanography. (3-0). Credit 3. I, II, S †

The various aspects of oceanography with emphasis upon those pertinent in the Gulf of Mexico. The principles upon which the disciplines of the subject are based. The unity of the marine sciences and their importance to man. The relations between oceanography and the fields of biology, chemistry, engineering, geography, geology, mathematics, meteorology, and physics. Opportunities in oceanography. Prerequisite: Senior classification in engineering or in a biological or physical science or the approval of the instructor.

431. Geological Oceanography. (3-0). Credit 3. I †

Topography and characteristic features of the ocean bottom; marine shorelines and processes operating in the coastal zone; nature of marine sediments; marine transportation and deposition of sedimentary materials; erosion of beaches. Prerequisites: General prerequisites for oceanography.

441. Chemical Oceanography. (3-0). Credit 3. I †

The chemical composition and properties of sea water; the definition and calculation of salinity; the pH, excess base, and carbon dioxide system in the sea; nutrients, their cycles and their distribution; oxygen and other dissolved gases; chemistry of sedimentation; composition of organisms and organic constituents of sea water; marine corrosion; extraction of raw materials from the sea. Prerequisites: General prerequisites for oceanography.

445. Atmospheric Physical Processes. (3-0). Credit 3. II †

The physics of heat, moisture, and momentum transfer in the atmosphere; radiation, evaporation, condensation, advection, convection, turbulence, and diffusion; their consequences upon the weather. Prerequisite: Oceanography 336.

446. Atmospheric Physics. (3-0). Credit 3. II, S †

Fog, cloud, and precipitation physics; thunderstorms; atmospheric electricity; optical and accoustical phenomena; turbidity; the structure and exploration of the higher atmosphere; atmospheres of other planets. Prerequisite: Oceanography 445.

457. Synoptic Weather Analysis. (1-12). Credit 5. II

Theory, methods, and practice of synoptic weather analysis in three dimensions. Detailed studies of the structure and motions of air currents, fronts, cyclones, anticyclones, pressure waves, tropical storms, and other features of the circulation. Prerequisites: Oceanography 318, 336.

458. Weather Analysis. (1-12). Credit 5. II, S

A continuation of Oceanography 457, but with the emphasis on motions of wind and weather patterns, and on weather sequence. Introduction to principles and methods of prognosis and weather forecasting. Prerequisites: Oceanography 445, 457.

FOR GRADUATES

601. Research Methods in Oceanography. (1-0). Credit 1. I, II, S

Selection of a research problem for thesis work; planning the program of investigation. Prerequisites: General prerequisites for oceanography.

603. Sea Laboratory Techniques. (0-6). Credit 2. II

Practice in techniques used regularly aboard ship and in oceanographic research laboratories. The time will be divided evenly between the techniques in biological, chemical, geological, physical, and meteorological oceanography. The purpose of the course is to give men in each phase of oceanography enough training to become laboratory assistants to specialists in the other phases. Prerequisites: General prerequisites for oceanography.

610. Physical Oceanography. (3-0). Credit 3. I

Survey of the physics of the sea; physical properties, transmission of light and sound in the sea, sea ice; heat budget of the sea and transformation of energy within the sea and at the boundaries; evaporation from the sea, description of water masses and their origin; the horizontal and vertical circulation of the seas; the applied dynamic and kinematic formulas for circulation in the sea; the concept of dynamic equilibrium of the different concentrations within the sea; introduction to waves and tides of the sea. Prerequisites: General prerequisites for oceanography.

611. Theoretical Physical Oceanography. (3-0). Credit 3. II

Theoretical and quantitative aspects; equations of motion; equation of continuity; boundary conditions; distribution of properties in the presence of diffusion; heat budget; stability; dynamics and computation of ocean currents; wind currents; turbulence; friction; work at sea. Prerequisites: Mathematics 210; Oceanography 610. (Also helpful are Mathematics 308 and Physics 301, 302, 405.)

612. Theory of Ocean Waves. (3-0). Credit 3. II

Generation and decay of waves in deep water; modification of waves and swell in shallow water; longshore currents and rip currents; wave action on structures. Prerequisites: Mathematics 210; Oceanography 610. (Also recommended is Mathematics 308.)

613. Engineering Aspects of Oceanography. (3-0). Credit 3. I

Review of practical information gained from oceanography research, including information on ocean waves, currents, sea level changes, and on physical, chemical, and biological parameters from an engineering point of view; application of this knowledge to such engineering problems as the maintenance of harbors, marine structures and ships, together with a discussion of related strategic operations at sea; marine instrumentation. Prerequisite: Oceanography 401 or 610.

614. Dynamics of the Ocean and Atmosphere. (3-0). Credit 3. I

Advanced theory of the ocean dynamics, a comparison of the hydrodynamic and thermodynamic character of the ocean and the atmosphere; the mutual dependence of the dynamics and thermodynamics of the sea on those of the air and vice versa; some special theories from the mean equations of motion, gradient wind, jet stream, mutual adjustment of the mass field and velocity field in the sea; mutually coupled temperature variations of the sea and the air; wind driven currents; the general hydrodynamic problem of the ocean and of the atmosphere, and an investigation of its uniqueness; the maintenance of the general circulation. Prerequisite: Oceanography 611. (Offered in 1955-56 and in alternate years thereafter.)

620. Biological Oceanography. (3-0). Credit 3. I

Critical study of important contributions defining major biological divisions, provinces, and life zones of the oceans; effects of climate, chemical and physical barriers, and phylogeny on zoogeography; factors relating to population cycles; productivity problems; ecological inter-relationships of major groups of plants and animals in the sea. Prerequisites: General prerequisites for oceanography.

621. Biological Oceanography of the Gulf of Mexico. (1-6). Credit 3. II

Detailed examination of those aspects of biological oceanography which are of major importance in the Gulf of Mexico. Prerequisites: Oceanography 620; undergraduate major in biology.

631. Geological Oceanography of the Gulf of Mexico. (2-3). Credit 3. II

Topography, stratigraphy, paleontology, and environments of the Gulf; littoral region and adjacent plains; forces acting on shorelines and bottoms; depositional surfaces, equilibria, equilibrium structures; tectonics; pleistocene history of region. Field trips. Prerequisites: Oceanography 431; undergraduate major in geology.

641. Chemical Oceanography. (3-0). Credit 3. II

Detailed study of selected topics in chemical oceanography which pertain to the Gulf of Mexico; industrial utilization of sea water and chemical products obtained from marine plants and animals; water freshening; industrial corrosion problems; chemical aspects of photosynthesis and fertility of the sea; chemistry of estuarine waters. Prerequisites: Oceanography 441; undergraduate major in chemistry; approval of the instructor.

642. Chemical Oceanography Laboratory. (0-6). Credit 2. II

Students will select one or more elements and investigate analytical procedures for the determination of these elements in natural sea water. Designed to be a problem course on the graduate level with emphasis on creating initiative in solving marine analytical problems. Field trip. Prerequisites: Oceanography 441; undergraduate major in chemistry; approval of the instructor.

643. Geochemistry of the Oceans. (3-0). Credit 3. I

Geochemistry of the oceanic hydrosphere, biosphere, and lithosphere; how these are affected by the atmosphere; study of the elements within them; geochemical evolution of the oceans. Prerequisites: Oceanography 441 and 641, or graduate classification in geology. (Offered in 1955-56 and in alternate years thereafter.)

651. Meteorological Oceanography. (1-3). Credit 2. II

The use of the conservative characteristics of the sea in forecasting meteorological and oceanographic phenomena. Calculation of ocean waves and swell, transformation of waves in shallow water, preparation of wave refraction diagrams and statistical summaries, modification of air masses in contact with the ocean, forecasting of fog and squalls, effect of the oceans upon climate of the world, meteorological tides. Prerequisites: Mathematics 210; Oceanography 401 or 610.

652. Ocean Boundary Layer Problems. (3-0). Credit 3. I

Theory of radiative exchange of energy at the sea surface; the theory of turbulent flow over hydrodynamically rough and smooth surfaces with application to the evaluation of the fluid frictional stresses at the boundaries of the sea, the evaluation of wind stress, evaporation, etc.; the micro-structure of temperature and salinity near the ocean surface; evaluation of turbulent exchange coefficients. Prerequisite: Oceanography 611. (Offered in 1954-55 and in alternate years thereafter.)

676. Hydrometeorology. (3-0). Credit 3. I

The role of weather and weather processes in land water problems. Prerequisite: Geography 310, or Oceanography 326, or approval of the instructor.

677. Applied Climatology and Meteorology. (3-0). Credit 3. II

Application of weather information and climatic data to various business, professional, commercial, industrial, and agricultural activities. Prerequisite: Approval of the instructor.

681. Seminar. (2-0). Credit 2. II

Presented by students and based upon their research work and upon surveys of the literature.

682. Selected Topics. (1-0). Credit 1. I

Presented by staff members, based chiefly on investigations in progress. For majors at Ph.D. level only.

685. Problems. Credit 1 to 4 each semester. I, II, S

A course offered to enable majors in oceanography at the Ph.D. level to undertake and complete with credit in their particular fields of specialization limited investigations which do not fall within their thesis research and which are not covered by any other courses in the established curriculum. An example of the solution of a special problem in oceanography would be the work done in analyzing a special set of data collected on a cruise at sea. The course may also consist of a special series of problem discussions not given periodically, such as those offered by visiting scientists. Prerequisites: Oceanography 431, 441, 610.

691. Research. Credit 1 or more each semester. I, II, S

For thesis or dissertation. Topic subject to approval of the Head of the Department.

Department of Petroleum Engineering

Professor A. B. Stevens,
Professors H. T. Kennedy, R. L. Whiting; Associate Professor J. R. Pedigo; Assistant Professor J. W. Amyx

204. The Petroleum Industry. (2-0). Credit 2. I

A general introductory study of the petroleum industry including historical development, exploration, development and production methods, transportation and refining of petroleum and the natural gas and natural gasoline industries. Prerequisite: Sophomore classification.

300. Petroleum Engineering Field Problems. (1-6). Credit 3. S

A field study of the problems encountered in oil and gas fields. Course consists primarily of visits to oil and gas fields. The requirements of this course will not permit a student to take any other course at the same time. Prerequisite: Completion of junior petroleum engineering courses.

NOTE: This course may be taken in place of field work as required of all graduates in petroleum engineering. Field work or this course required before registration in any of the senior or fifth year petroleum engineering courses.

305. Petroleum Development. (3-0). Credit 3. I

Petroleum exploration, principles of oil field development, rotary and cable tool drilling methods, drilling fluids, oil field hydrology, well completion practice, and well records. Prerequisites: Geology 201, 207; Mathematics 210; Physics 203; registration in English 207 and Geology 311 except for students taking the five-year petroleum engineering curriculum.

306. Petroleum Production Methods. (3-0). Credit 3. II

Elements of reservoir engineering, factors influencing the flow of oil into the well, operation of flowing, gas lift and pumping wells. Prerequisites: Petroleum Engineering 305, 307.

307. Petroleum Development Laboratory. (0-3). Credit 1. I

Properties of petroleum; operation of rotary drilling rig; well surveying practices; tests on drilling fluids and cements. Prerequisite: Petroleum Engineering 305 or registration therein.

308. Petroleum Production Laboratory. (0-3). Credit 1. II

Efficiency of oil well plunger pump; balancing of pumping wells; determination of surface tension; core analysis; gas-lift methods. Prerequisite: Petroleum Engineering 306 or registration therein.

402. Petroleum Production Economics. (3-0). Credit 3. II †

Factors which influence the value of oil and gas properties; preparations of valuation reports, cost data, operating organization, regulation of petroleum production. Prerequisites: Petroleum Engineering 413, 428.

405. Equipment and Applications. (2-2). Credit 3. I †

A study of the drilling and production equipment used in oil field practice. Prerequisites: Civil Engineering 305; Petroleum Engineering 305, 306, 307, 308.

409. Subsurface Engineering. (1-3). Credit 2. I †

Well logging, contour maps, isopachous maps, and the determination of the size, shape, and volume content of petroleum reservoirs. Prerequisites: Petroleum Engineering 305, 306, 307, 308.

413. Natural Gas Engineering. (2-2). Credit 3. I †

Theory of measurement, treatment and transportation of natural gas. Phase behavior of hydrocarbon mixtures and the production of natural gas liquids. Prerequisites: Chemistry 344; Mechanical Engineering 323; Petroleum Engineering 306.

414. Oil Measurements and Transportation. (3-0). Credit 3. II †

The separation of gas and oil, and methods of treating oil field emulsions. The measurement, sampling and testing of crude oil, tank strapping and preparation of tank tables, oil storage, the prevention of loss by evaporation, fire and lightning protection. The principles of fluid mechanics as applied to pipeline design and construction. Prerequisites: Civil Engineering 311; Petroleum Engineering 413.

415. Gas Measurement Laboratory. (0-3). Credit 1. I †

Construction and operation of orifice and positive displacement meters, measurement by pitot tube, orifice well tester and critical flow prover, analysis of natural gas. Determination of specific gravity, hydrogen sulphide content, gasoline content and heating value of natural gas. The operation of regulators and flow controls, determination of compressibility factors of natural gas. Prerequisite: Petroleum Engineering 413 or registration therein.

416. Oil Measurements and Transportation Laboratory. (0-3). Credit 1. II †

Gauging practices, treating of oil-water emulsion, heat and sulphur content of petroleum and its products, determination of viscosity, gravity water content, carbon residue, and the coefficient of expansion of petroleum. Determination of vapor pressure of natural gasoline. Distillation of crude oil and gasoline. Methods of metering petroleum. Water analysis. Prerequisite: Petroleum Engineering 414 or registration therein.

417. Petroleum Engineering Seminar. (0-2). Credit 1. I †

The study and presentation of papers pertaining to recent developments in the field of petroleum engineering. Prerequisites: Petroleum Engineering 305, 306, 307, 308.

418. Petroleum Engineering Seminar. (0-2). Credit 1. II †

The study and presentation of papers pertaining to recent developments in the field of petroleum engineering. Prerequisites: Petroleum Engineering 305, 306, 307, 308.

419. Drilling Fluids. (0-3). Credit 1. II †

A laboratory course in which field technique control of mud fluids to facilitate drilling is taught. Prerequisites: Senior classification in petroleum engineering; approval of the Head of the Department.

428. Reservoir Engineering. (3-0). Credit 3. I †

A study of the pressure-volume-temperature-composition relationships in oil and gas mixtures (P-V-T relationships). The flow of fluids through porous media. Material balance methods, including identification of type of reservoir mechanism, volume calculations, future production under primary recovery and gas injection; water influx calculations. Prerequisites: Petroleum Engineering 305, 306, 307, 308, and registration in 413 and 415.

438. Secondary Recovery Methods. (3-0). Credit 3. II

A study and application of the principles and practices relating to the recovery of oil by water flooding and gas injection. Prerequisite: Petroleum Engineering 428.

FOR GRADUATES

601, 602. Drilling and Completing Wells. (3-3). Credit 4 each semester. S

An advanced study of the problems encountered in the drilling and completing of oil and gas wells. Prerequisite: Approval of Head of Department.

603, 604. Advanced Reservoir Engineering. (3-3). Credit 4 each semester. I, II

An advanced course in petroleum production practices, with special reference to the fundamental principles of flow of reservoir fluids. Prerequisite: Approval of Head of Department.

605. Phase Behavior of Petroleum Reservoir Fluids. Credit 2 to 4 each semester. I

A study of the pressure, volume, temperature, composition relationships of petroleum reservoir fluids. Prerequisite: Approval of Head of Department.

607. Recovery Methods. Credit 2 to 4 each semester. II

A study of methods of increasing recovery of petroleum from petroleum reservoirs. Prerequisite: Approval of Head of Department.

608. Well Logging Methods. (2-3). Credit 3. II

An advanced study of well logging methods for determining the nature and fluid content of formations penetrated by the drill. Prerequisite: Approval of Head of Department.

681. Seminar. (1-0). Credit 1 each semester. I, II

A study and presentation of papers on recent developments in reservoir mechanics. Prerequisite: Approval of Head of Department.

691. Research. Credit 1 or more each semester. I, II

Advanced work on some special problem within the field of petroleum engineering. A thesis course. Prerequisite: Approval of the Head of the Department.

Department of Physical Education

Professor C. E. Tishler,

Professors A. D. Adamson, W. M. Dowell; Associate Professors P. M. Andrews, C. W. Landiss, H. B. Segrest; Assistant Professors L. A. Harrison, Jr., Emil Mamaliga, N. A. Ponthieux; Instructors R. C. Bell, W. A. Goellner, J. W. Griffith, L. K. Hayes, N. D. Matthews, L. L. Palmer*

*On leave of absence.

Physical Education 101, 102, 201, and 202 are required in all curricula. Those students who are unable to pass a prescribed swimming test will be required to register for elementary swimming instruction, and students who are unable to pass a physical fitness test will be required to register for general conditioning activities. All others may elect to register for one of the following activities: badminton, bowling, boxing, conditioning, diving, fencing, golf, gymnastics, handball, life saving, swimming, tennis, volleyball, water polo, weight training, or wrestling. The purpose of these courses is to teach the student through instruction and practice the fundamental knowledge and skills of at least two activities in which he will be able to participate in adult life. No student will be permitted to repeat an activity unless he has failed it.

Students may elect Physical Education 301, 302 for credit of one hour each after having completed the required courses.

101. Required Physical Education. (0-2). No credit. I, II

102. Required Physical Education. (0-2). No credit. I, II

201. Required Physical Education. (0-2). No credit. I, II

202. Required Physical Education. (0-2). No credit. I, II

210. Life Saving and Pool Management. (1-3). Credit 2. II

Designed to qualify students for Red Cross Senior Life Saving and Instructor's certificates; includes a study of sanitary codes and pool sanitation, problems of pool and waterfront management; selection of personnel. Prerequisite: Advanced swimming. (Offered in 1954-55 and in alternate years thereafter.)

211. Physical Education Activities. (1-3). Credit 2. I

A basic course designed to provide instruction and development of skill in physical education activities.

213. Introduction to Physical Education. (2-0). Credit 2. I, II

The approach, fundamental principles and application of principles; definition, traditions, developments, psychology, aims, objectives, and results of physical education; building a program of health and physical education. Prerequisites: Sophomore classification; approval of instructor. (Professional Education)

216. First Aid. (0-3). Credit 1. I, II, S

Prepares students for Red Cross Standard, Advanced, and Instructor's First Aid certificates.

218. Athletic Injuries. (1-3). Credit 2. II

A study of the conditioning and training of the individual and team; care and prevention of injuries. Prerequisites: Biology 219; Physical Education 216.

221. Safety Education. (2-0). Credit 2. I

A study of the general program of safety education; accidents, preventive measures, traffic safety, safety at home, school, and work; visual aids, safety projects, special programs; utilization of agencies outside of school.

226. Introduction to Recreation. (2-0). Credit 2. II

A study of the nature, extent, significance, and history of recreation; leadership personnel, its function, training, and selection; planning recreation areas and facilities; program planning and activity organization.

301. Physical Education. (0-3). Credit 1. I, II

This course may be elected by students having completed the two required years of physical education. It is designed to give students an opportunity to improve skill in carry-over sports.

302. Physical Education. (0-3). Credit 1 I, II

This course may be elected by students having completed the two required years of physical education. It is designed to give students an opportunity to improve skill in carry-over sports.

315. Elementary School Physical Education. (2-3). Credit 3. II

Organization of physical activities in public schools; methods in teaching games used in public school programs. Prerequisites: Junior classification; approval of instructor. (Professional Education, Curriculum and Methods, Elementary Education) (Offered in 1954-55 and in alternate years thereafter.)

316. Secondary School Physical Education. (2-3). Credit 3. I

Class organization, control, and management; methods of presenting subject matter; special methods in activities; tests and measurements. Prerequisites: Junior classification; approval of instructor. (Professional Education, Curriculum and Methods, Secondary Education)

317. Coaching of Football. (1-3). Credit 2. I

Teaching of fundamentals; individual techniques; training; offensive and defensive strategy; officiating. Prerequisites: Junior classification; approval of instructor. (Offered in 1955-56 and in alternate years thereafter.)

318. Coaching of Track. (1-3). Credit 2. II

Teaching of techniques of each event; selection of individuals for events; methods of training; conducting meets. Prerequisites: Junior classification; approval of instructor. (Offered in 1954-55 and in alternate years thereafter.)

321. Coaching of Tennis. (1-3). Credit 2. I

Analysis, theory, and practice of tennis strokes; strategy; methods of coaching; organizing and conducting tournaments. Prerequisites: Junior classification; approval of the instructor. (Offered in 1955-56 and in alternate years thereafter)

325. Outdoor Activities. (2-0). Credit 2. II

A course designed to acquaint the student with the function of the camp and outdoor activities as educational agencies through the medium of practical projects and activity, organization, problems, and modern programs in the various areas. Prerequisites: Physical Education 226 or junior classification; approval of the instructor.

350. Community Recreation. (3-0). Credit 3. I

Organization and administration; staff, facilities, and equipment; types of programs; coordination of recreational agencies; acquisition, construction, and maintenance of areas; supervision of playgrounds, day camps, community centers, and special recreational programs. Prerequisites: Physical Education 226; junior classification; approval of instructor. (Offered in 1954-55 and in alternate years thereafter)

410. Coaching of Baseball. (1-3). Credit 2. II

Teaching of individual techniques; position play; training; team offensive and defensive strategy. Prerequisites: Junior classification; approval of instructor. (Offered in 1955-56 and in alternate years thereafter)

415. Secondary School Health Education. (3-0). Credit 3. I, S †

A study of health problems; needs of the individual; cooperation of home and community; resources for health in community, state, and nation; techniques of evaluation. Prerequisites: Biology 225; approval of instructor. (Professional Education, Curriculum and Methods, Secondary Education)

419. Coaching of Basketball. (1-3). Credit 2. I

Preparation for the season; training; offensive and defensive fundamentals; team offense and defense; game strategy. Prerequisites: Junior classification; approval of instructor. (Offered in 1954-55 and in alternate years thereafter)

421. Elementary School Health Education. (3-0). Credit 3. S †

A study of modern trends and methods in the elementary school health program; survey of materials and agencies and their value to an adequate health program. Prerequisites: Biology 225; approval of instructor. (Professional Education, Curriculum and Methods, Elementary Education)

423. Administration of Health and Physical Education. (3-0). Credit 3. I, S †

Administrative problems involved in the coordination of the health, physical education, intramural, and athletic areas in a comprehensive program of physical education. Prerequisites: Biology 225; Physical Education 213, 415. (Administration)

425. Tests and Measurements. (3-0). Credit 3. II, S †

Use, interpretation, evaluation, and administration of existing tests in health and physical education; application of elementary statistical procedures. Prerequisites: Physical Education 415, 423; senior classification. (Professional Education)

427. Remedial Exercises. (3-0). Credit 3. II

Elementary techniques in diagnosing functional and structural defects; procedures of individual exercise with emphasis on preventive and remedial measures. Prerequisites: Biology 219, 220; approval of instructor. (Curriculum and Methods) (Offered in 1955-56 and in alternate years thereafter)

450. Directed Teaching. (2-12). Credit 6. I, II

Construction of lesson plans, observation and supervised practice teaching in secondary schools. Prerequisites: Physical Education 316; senior classification. (Curriculum and Methods, Secondary Education)

FOR GRADUATES

601. Survey of Research. (3-0). Credit 3. S

A study of published reports and research in the field of health and physical education. Prerequisite: Education 426 or Physical Education 425. (Professional Education)

603. Coaching and Officiating. (3-0). Credit 3. S

Advanced coaching and officating techniques in football, basketball, track, and baseball. Prerequisites: Teaching and coaching experience. (Methods for the Special Certificate in Physical Training)

614. Philosophy and Principles. (3-0). Credit 3. S

Divergent origins, leaders, conditions, and forces affecting the development of health and physical education. Critical analysis of objectives. Principles of education, psychology, and physiology, and their implications in health and physical education. Prerequisite: General prerequisite for minor. (Professional Education) (Offered in 1955-56 and in alternate years thereafter)

622. Supervision of Health and Physical Education. (3-0). Credit 3. S

Methods and policies of the school supervisor; conferences, planning and presenting the program, evaluating results, improving teachers-in-service. Prerequisite: Physical Education 423. (Supervision) (Offered in 1954-55 and in alternate years thereafter)

631. Community and Public Health. (3-0). Credit 3. S

A study of community health problems and of public health measures to solve them. Typical organizations and specific functions of state and local health departments; relationship of local health department to state and federal health agencies and programs. Prerequisite: Physical Education 415 or 421. (Professional Education) (Offered in 1955-56 and in alternate years thereafter)

636. Advanced Tests and Measurements. (3-0). Credit 3. S

Critical study of tests and measurements available; methods of constructing and evaluating new tests and measurements. Prerequisite: Physical Education 425. (Professional Education) (Offered in 1954-55 and in alternate years thereafter)

Department of Physics

Professor J. G. Potter,
Professors E. G. Smith, E. E. Vezey, D. F. Weekes; Associate Professors P. W. Barker, C. H. Bernard, J. B. Coon, M. Eisner; Assistant Professors B. B. Boriskie, N. M. Duller; Instructors U. H. Bents, A. B. Hilton, C. M. Loyd, R. W. Mitchell, J. W. Overall, R. K. Russell, J. K. Ward, F. C. Whitmore, W. L. Zingery

Students who present for transfer courses in college physics of less credit value than the required courses in this college may validate their transfer work and receive credit in physics by examination if they wish to do so.

It is recommended, however, that students transferring with only eight hours in physics register for either Physics 223, or Physics 225 and 226. These courses are designed to supplement the student's previous instruction in physics.

201. College Physics. (3-3). Credit 4. I, II, S

An elementary course with material selected especially with reference to the needs of premedical and predental students and students of architecture and education. Fundamentals of classical mechanics, heat, and sound. Prerequisite: Mathematics 103.

202. College Physics. (3-3). Credit 4. I, II, S

A continuation of Physics 201. Fundamentals of classical electricity and light and introduction to contemporary physics. Prerequisite: Physics 201.

203. General Physics. (4-3). Credit 5. I, II, S

A comprehensive course for students of engineering and the physical sciences, providing the background for many of the engineering courses as well as for other physics courses. Cultivation of the capacity to utilize the fundamental concepts in the solution of problems is emphasized. Mechanics, wave motion, and heat. Prerequisites: Mathematics 209 or registration therein; Mechanical Engineering 101 or 108, or Physics 211, or 213.

204. General Physics. (4-3). Credit 5. I, II, S

A continuation of Physics 203. Sound, light, electricity, and atomic phenomena. Prerequisites: Mathematics 209; Physics 203.

207. General Physics. (3-3). Credit 4. I

A course planned especially for students pursuing independent courses in electricity or electrical engineering. The content of this semester is equivalent to the mechanics included in Physics 203. Prerequisites: Mathematics 209 or registration therein; Mechanical Engineering 101 or 108 or Physics 211.

208. General Physics. (3-3). Credit 4. II

A continuation of Physics 207. The content of this semester is equivalent to the sound, light, and atomic physics included in Physics 203, 204. Prerequisites: Mathematics 209; Physics 207.

211. A Brief Survey of Physics. (3-3). Credit 4. II

A course designed to acquaint students with a field of knowledge and contemporary activity of importance in modern thinking. Prerequisite: Mathematics 101 or 110.

213. Physics for Students of Agriculture. (2-2). Credit 3. I, II

A brief course emphasizing fundamentals of special importance to students of agriculture in the fields of mechanics, heat, light, and electricity. Prerequisite: Mathematics 101.

215. Introductory Physics. (2-2). Credit 3. I

A course for pre-veterinary medicine students restricted to those topics in physics of importance to all students of veterinary medicine. The material of the first semester is in the fields of mechanics, heat, and sound. Prerequisites: Mathematics 101, 103.

216. Introductory Physics. (2-2). Credit 3. II

A continuation of Physics 215. The material of the second semester is in the fields of light, magnetism and electricity, and atomic, molecular, and nuclear phenomena. Laboratory exercises emphasizing measurements, concepts, and the experimental basis for physics are selected from all the fields of physics. Prerequisite: Physics 215.

223. Supplementary General Physics. (4-0). Credit 4. I

An intensive course designed to supplement the physics instruction of certain transfer students to bring the level of their preparation in physics to a par with that of students completing Physics 203, 204. Failure in this course can be made up only by taking Physics 203, 204. Prerequisites: Mathematics 209 or the equivalent and at least 6 semester hours of credit for college physics.

225. Supplementary General Physics. (2-0). Credit 2. I

The first half of the program offered in Physics 223. Failure can be made up only by taking Physics 203. Prerequisites: Mathematics 209 or registration therein and at least three semester hours of credit for a college physics course devoted primarily to mechanics and heat.

226. Supplementary General Physics. (2-0). Credit 2. II

The second half of the program offered in Physics 223. Failure can be made up only by taking Physics 204. Prerequisites: Mathematics 209; Physics 203 or 225 and at least three semester hours of credit for a college physics course devoted primarily to sound, electricity, and light.

301. Heat. (3-3). Credit 4. I †

Heat transfer, specific heats, developments of thermodynamic concepts introducing statistical mechanics and kinetic theory, phase and change of state, and radiation. Prerequisites: Mathematics 210; Physics 204 or 208.

302. Mechanical Properties of Matter. (2-3). Credit 3. II †

Rotational inertia, simple harmonic motion of translation and rotation, Kater's pendulum, gravitational fields and potential theory, gyroscopic motion, elasticity of beams, torsion, theory of elasticity, elasticity of fluids, surface tension and its application to the optimum shape for pressure vessels, diffusion, units and dimensions. Special attention is given to the setting up of equations representing physical facts, the interpretation of their solutions, and the determination of the limitations imposed by each approximation and assumption. Prerequisites: Mathematics 308 or registration therein; Physics 204 or 208.

310. Applications of Modern Physics. (2-2). Credit 3. II

A comparatively non-technical survey of modern applications of atomic phenomena of interest to students of geology, biochemistry, genetics, biology, engineering, and especially premedical and predental students. Electrons, ions, isotopes, electromagnetic waves, spectra, x-rays, atomic structure, radiation, radioactivity, atomic particles, and atomic energy. Some demonstration laboratory work will accompany certain phases of the course. Prerequisites: Chemistry 101; Physics 202, or 204.

311. Atomic Physics. (3-0). Credit 3. I †

An introductory survey of atomic physics. The particles of modern physics, kinetic theory, relativity, atomic structure, spectra, quantum theory, the periodic table; photoelectricity, thermionic emission, electrical phenomena in gases, x-rays, radioactivity, nuclear phenomena, atomic power, nuclear reactor operation, radiation measurements, and the handling of radioactive isotopes. Prerequisites: Mathematics 210; Physics 204 or 208.

312. Elements of Nuclear Physics. (2-0). Credit 2. II †

A description of nuclear phenomena and their applications in so far as they can be treated without special mathematical methods, such as those of quantum mechanics. The fundamental particles, natural radioactivity, induced radioactivity, the various means of transmutation, accelerating equipment, detecting equipment, cosmic ray phenomena, nuclear fission, nuclear forces, pair and meson production, radioactive isotope tracers, utilization of "atomic" energy. Prerequisite: Physics 311.

314. Survey of Astronomy. (3-0). Credit 3. I

A study of the solar system, meteors, asteroids, comets, stars, clusters, nebulae, Kepler's laws, laws of gravitation and astronomical instruments. Occasional evening meetings will be held for observation. Prerequisites: Mathematics 101, 103, 104.

315. Photography. (1-3). Credit 2. I, II

Cameras, lenses, and shutters; light meters; photographic optics; speed of a lens; properties of the photograhic emulsion; exposure and development of the negative; negative corrections. Printing processes (black and white); tone reproduction and control of contrast; use of filters; composition; lighting; natural, flood, and flash. Prerequisite: Approval of instructor.

317. Celestial Mechanics. (4-0). Credit 4. II †

A mathematical formulation of the principles of celestial mechanics, including such fundamental astronomical principles as central forces, potential and attractions of bodies, the problem of two bodies, the problem of three bodies, the problem of n bodies, the laws of binary star systems, the determination of orbits, and perturbations. Prerequisites: Mathematics 210; Physics 201 or 203.

319. Instrumentation for Geophysics. (2-3). Credit 3. II

The use and servicing of instruments and components employed in seismic operations, well logging, and other geophysical measurements. Interpretation of oscilloscopic presentations in terms of the functioning of the instruments and phenomena observed. Prerequisite: Physics 204.

401. Optics. (3-3). Credit 4. II †

A systematic treatment of physical and geometrical optics featuring applications to optical instruments. Prerequisites: Mathematics 210; Physics 204 or 208.

405. Physical Mechanics. (3-0). Credit 3. II †

A comprehensive formulation of the principles of mechanics employing the calculus and vectorial methods. Orbital motion, Coriolis accelerations, motions of rigid bodies, forced vibrations and resonance phenomena, wave propagation, fluid mechanics. Prerequisites: Mathematics 405 or registration therein; Physics 302 or the equivalent.

407. Geophysics and Geophysical Methods. (3-0). Credit 3. II †

A study of the earth's gravitational, magnetic, electrical, elastic, and thermal properties, and the various methods of geophysical prospecting. The effects of various types of deposits upon each method are shown with the object of determining from an analysis of structural and lithologic conditions the type of geophysical method most suitable in any particular area. Prerequisites: Mathematics 210; Physics 204 or 208.

411. Experimental Modern Physics. (0-6). Credit 2. I †

Selected practical topics of atomic and nuclear physics are pursued to the point where measurements and investigations are conducted in the laboratory. Prerequisite: Physics 311.

413. Electricity and Magnetism. (2-3). Credit 3. I †

DC and AC circuit theory, thermal and chemical electromotive forces, electrical instruments, electron emission. Prerequisites: Mathematics 308; Physics 204.

414. Electricity and Magnetism. (1-3). Credit 2. II †

Non-linear circuits, functions of tubes in electrical circuits, circuits and circuit elements for physical measurements. Prerequisite: Physics 413 or approval of the instructor.

416. Electromagnetic Fields. (3-0). Credit 3. II †

Electric and magnetic field theory with emphasis on vector analysis and culminating in an introduction to electromagnetic radiation; properties of dielectrics and magnetic materials. Prerequisites: Mathematics 405; Physics 204; approval of the instructor.

FOR GRADUATES

601. Analytical Mechanics. (4-0). Credit 4. I, S

Dynamics of particles and of rigid bodies, gyrodynamics, potential theory, Hamilton's principle, principle of least action, LaGrange's equations, and the Hamilton-Jacobi equation with applications. Prerequisites: Mathematics 405 or 601; Physics 405.

602. Fluid Mechanics and Elasticity. (4-0). Credit 4. II, S

Mechanics of continuous media. Foundations of elasticity with application to theory of beams, plates, and shells. Hydrodynamics of viscous and non-viscous fluids. Supersonic flow and shock wave propagation. Boundary layer theory. Lubrication theory. Prerequisite: Physics 601 or the equivalent. (Offered in 1955-56 and in alternate years thereafter)

603. Electromagnetic Theory. (4-0). Credit 4. II, S

Theory of electromagnetism; static and time-varying fields; propagation, reflection, and refraction of electromagnetic waves. Prerequisites: Mathematics 601 or the equivalent; Physics 414.

604. Applied Electrodynamics. (4-0). Credit 4. I

Applications of electromagnetic theory in the field of ultra-high frequency radio; skin effect, retardation, wave guides, resonant cavities and antennas. Prerequisite: Physics 603. (Offered in 1956-57 and in alternate years thereafter)

605. Thermodynamics. (4-0). Credit 4. II, S

The fundamentals of classical thermodynamics including first and second laws, thermodynamic potentials, conditions for equilibrium, properties of gases; thermodynamics of electromagnetic systems, and a brief treatment of kinetic theory including Maxwell velocity distribution law, viscosity, and diffusion. Prerequisites: Mathematics 307, 308; Physics 301 or the equivalent.

607. Statistical Mechanics. (4-0). Credit 4. I

Fundamentals of statistical methods and their application to physical systems; ensembles; principles of classical statistics by most probable distributions and mean value distributions; Maxwell-Boltzman distributions; thermodynamics and statistics; statistical basis of entropy; Fermi-Dirac and Bose-Einstein statistics; degenerate electron gas applied to electronic phenomena in metals; degenerate Bose-Einstein statistics applied to liquid helium; Debye theory of specific heats; statistical mechanics in atomic and nuclear physics. Prerequisite: Approval of instructor.

609. X-Rays and Crystal Physics. (3-3). Credit 4. I

The generation and properties of x-ray, x-ray apparatus and high voltage equipment, ionization, absorption, polarization, scattering, reflection, refraction, x-ray spectra. X-ray analysis of the ultimate structures of materials; crystal classes, theory of scattering from crystals, experimental x-ray methods of crystal structure analyses including the powder, rotation, and Laue methods; modern theories of, and methods for, structure analysis of gases, liquids, and amorphous materials from interpretations of their diffraction patterns. Prerequisite: Physics 311 or the equivalent. (Offered in 1955-56 and in alternate years thereafter)

611. Advanced Optics. (4-0). Credit 4. I

The electromagnetic theory of optical phenomena in discontinuous, isotropic and anisotropic media. Prerequisite: Physics 603. (Offered in 1955-56 and in alternate years thereafter)

612. Atomic Structure. (3-0). Credit 3. I, S

A study of the atom and atomic spectra from the quantum mechanical viewpoint including the hydrogen atom, perturbation method, complex atoms, transition probabilities, angular momentum operators, multiplet structure of energy levels, fine structure and electron spin. Prerequisites: Mathematics 307 and 308, or the equivalent; Physics 311.

614. Molecular Structure. (4-0). Credit 4. II

Theory of symmetry groups, normal coordinates, vibrational and rotational energy levels, electronic states of diatomic molecules, molecular orbitals, exchange forces, covalent bonds, resonance, complex molecules. Prerequisite: Physics 612. (Offered in 1955-56 and in alternate years thereafter)

617. Physics of the Solid State. (3-0). Credit 3. II

A study of the electrical, magnetic, thermal, and mechanical properties of crystalline solids. Lattice energy of ionic crystals, lattice vibrations, dielectric phenomena, luminescence and phosphorescence, electron theory of metals, band theory, semiconductors, low temperature behavior of solids. Prerequisites: Physics 603, 607, and 623 or the equivalent. (Offered in 1954-55 and in alternate years thereafter)

618. Nuclear Theory. (3-0). Credit 3. II

Application of quantum mechanics to nuclear phenomena. Prerequisite: Physics 311, 623 or the equivalent. (Offered in 1954-55 and in alternate years thereafter)

623. Quantum Mechanics. (4-0). Credit 4. I, S

Foundations of quantum mechanics; theories of Heisenberg and De Broglie with applications especially to nuclear physics. Prerequisites: Mathematics 602 or the equivalent; Physics 601, 612, 625.

625. Nuclei and Solids. (3-0). Credit 3, II, S

Nuclei and properties of fundamental particles; theory of simple nuclear models; scattering, spins, magnetic moments and cross sections; alpha, beta, and gamma decay; detection, measurement, and production of nuclear particles; nuclear spectroscopy; solid state phenomena; magnetism; electron emission; specific heats; investigation of solid structure by diffraction techniques. Prerequisites: Mathematics 307, 308, 601; Physics 312 or the equivalent.

627. Relativity. (3-0). Credit 3. II

Special relativity and its application to covariant formulation of mechanics and electrodynamics. Theory of general relativity including development of necessary tensor calculus and non-Euclidean geometry. Predictions of general relativity and experimental tests of theory; cosmological problems and unified field theories. Prerequisites: Physics 601, 603. (Offered in 1956-57 and in alternate years thereafter)

685. Problems. Credit 1 to 4 each semester. I, II, S

Individual problems not related to thesis.

691. Research. Credit 1 or more each semester. I, II, S

Research toward thesis or dissertation.

Department of Plant Physiology and Pathology

Professor G. M. Watkins;
Associate Professor W. C. Hall; Assistant Professors H. E. Joham, D. W. Rosberg, M. D. Whitehead

301. Plant Pathology. (2-3). Credit 3. I

An introduction to the fundamental principles of plant pathology, including diagnosis, cause, and control of plant diseases. Prerequisites: Biology 101, 206.

313. Introduction to Plant Physiology. (2-3). Credit 3. I

A general course dealing with the principal life processes of the higher plants, with particular emphasis on the influence of environmental factors on the processes and development of crop plants. Prerequisites: Biology 101; Chemistry 102.

314. Principles of Plant Physiology. (3-3). Credit 4. II †

A more advanced and detailed study of the physiology of green plants than Plant Physiology and Pathology 313, with emphasis on water relations, mineral nutrition, photosynthesis, and growth. Prerequisites: Chemistry 231; Physics 213; Plant Physiology and Pathology 313.

401. Diseases of Field Crops. (2-3). Credit 3. II †

Designed to give a detailed knowledge of the major diseases of our field crops such as cotton, corn, sorghum, small grains, flax, peanuts and other legumes, and forage grasses. Types of diseases studied will include rusts and smuts of cereals, leaf spots, root rot, seedling blights, wilts, mildews, anthracnose, stem rots, and virus diseases. Prerequisite: Plant Physiology and Pathology 301.

403. Diseases of Fruits and Vegetables. (2-3). Credit 3. I †

Identification and control of the important diseases of fruit and vegetable crops in Texas. Consideration will also be given to diseases of major berry crops and pecans. Various diseases and types of decay affecting products in shipment or storage will be studied. Prerequisite: Plant Physiology and Pathology 301.

405. Diseases of Ornamental Plants. (2-3). Credit 3. II †

A course dealing with the recognition, nature, and control of diseases of grasses, flowering plants, shrubs, and trees used for ornamental purposes in the southwestern states. Attention will be paid also to soil sterilization, common greenhouse and nursery problems, and plant quarantine. Prerequisite: Plant Physiology and Pathology 301.

FOR GRADUATES

605. Plant Metabolism. (2-0). Credit 2. II

Photosynthesis and respiration are discussed in detail, including the history and recent developments in these fields. Prerequisite: Plant Physiology and Pathology 314, or Biochemistry and Nutrition 601 and approval of instructor. (Offered in 1955-56 and in alternate years thereafter)

607. Physiology of the Fungi. (3-0). Credit 3. I

A general course in the physiological activities of fungi, including growth and development, mineral nutrition, carbon and vitamin nutrition, the chemistry of metabolic products, fungicides, and the physiology of parasitism and resistance. Prerequisite: Plant Physiology and Pathology 314. (Offered in 1955-56 and in alternate years thereafter)

609. Quantitative Plant Physiology. (2-6). Credit 4. II

Methods employed in the various types of physiological investigations and the interpretation of results obtained by them. Prerequisite: Plant Physiology and Pathology 314. (Offered in 1955-56 and in alternate years thereafter)

611. Plant Nutrition. (2-0). Credit 2. II

This course deals with the inorganic nutrition of plants. It includes solute absorption, accumulation and translocation; growth of plants in artifical media; physiological roles of various elements in the plant and biochemical problems associated with salt absorption. Prerequisite: Plant Physiology and Pathology 314 or equivalent. (Offered in 1954-55 and in alternate years thereafter.)

612. Phytohormones and Plant Growth Regulators. (3-0). Credit 3. II

This course includes material on the classification, properties, and action of naturally occuring plant hormones as well as a discussion of the synthetic growth regulators. Material is included on practical application and uses of phytohormones and growth regulators. Prerequisite: Plant Physiology and Pathology 314 or equivalent. (Offered in 1954-55 and in alternate years thereafter)

A course dealing with the growth, differentiation, and development of higher plants.

613. Plant Growth and Development. (2-0). Credit 2. I

A comprehensive study of vernalization and photoperiodism is included as well as a discussion of the influences of water relations, mineral nutrition, and hormones on the developmental cycle. Consideration is also given to differentiation within the plant as related to such qualities as winter hardiness and drought resistance. Prerequisite: Plant Physiology and Pathology 314 or equivalent. (Offered in 1954-55 and in alternate years thereafter)

616. Methods in Plant Pathology. (2-6). Credit 4. II

A presentation of the methods by which plant diseases are identified and investigated. Emphasis is placed on preparation for research work in plant pathology. Prerequisite: Plant Physiology and Pathology 401, 403 or 405 or the equivalent. (Offered in 1955-56 and in alternate years thereafter)

617. Parasitism in Plant Disease. (3-3). Credit 4. II

A critical presentation of the literature on the invasion of plant tissues by parasitic bacteria, fungi, and nematodes. Mechanisms of host defense are examined. Processes are illustrated in the laboratory through the study of histological preparations and by experimentation. Prerequisites: Plant Physiology and Pathology 401, 403, or 405. (Offered in 1954-55 and in alternate years thereafter)

618. Bacterial Plant Diseases. (2-3). Credit 3. I

A detailed study of bacterial diseases of fruit and vegetable crops, field crops and ornamental plants, with special emphasis upon the nature of the disease, dissemination of the pathogen and methods of control. Prerequisite: Plant Physiology and Pathology 401, 403 or 405 or the equivalent. (Offered in 1955-56 and in alternate years thereafter)

619. Seed-Borne Diseases. (2-3). Credit 3. I

An intensive study of seed-borne plant diseases. Morphology of the seed will be treated from the standpoint of parasitic invasion. Germination techniques and problems concerning disease free and infected seed will be studied along with the morphology of the disease organisms, processes of infection, types of injury, and means of control. Prerequisite: Biology 353 or Plant Physiology and Pathology 301. (Offered in 1955-56 and in alternate years thereafter)

620. Plant Viruses. (2-0). Credit 2. I

Lecture presentation and discussion of the nature and properties of plant viruses. Methods of virus transmission, host plant reactions to viruses, serological reactions, and methods of purification of viruses for examination under the electron microscope, and the study of economically important plant virus diseases and their control. Prerequisite: Plant Physiology and Pathology 401, 403 or 405 or the equivalent. (Offered in 1954-55 and in alternate years thereafter)

681. Seminar. (1-0). Credit 1 each semester. I, II

Reports and discussions of topics of current interest in plant physiology and plant pathology, including reviews of literature on selected subjects.

685. Problems. Credit 1 to 4 each semester. I, II

Individual problems or research not pertaining to a thesis or dissertation. Prerequisites: Plant Physiology and Pathology 314 or the equivalent (for physiology), 401, 403, or 405, or the equivalent (for pathology).

691. Research. Credit 1 or more each semester. I, II

Original investigations in support of thesis or dissertation.

Biochemistry and Nutrition 601. Biochemistry of Plants. (3-0). Credit 3. I

See page 264 for a full description of this course.

Department of Poultry Husbandry

Professor J. H. Quisenberry,
Professors J. R. Couch, E. D. Parnell, R. M. Sherwood; Associate Professor W. E. Briles; Assistant Professors W. F. Krueger, C. B. Ryan

201. Poultry Production. (2-2). Credit 3. I, II

The breeds and types of poultry, culling poultry for egg production, incubation, brooding and feeding for growth and egg production, winter and summer management, housing and hygiene, preparing poultry for market, methods of marketing, practical application of these subjects to general farm conditions. The practice consists of the identification of breeds and varieties, judging poultry for egg production, plans for poultry farms and poultry houses, identification of feeds.

303. Turkey Production. (2-0). Credit 2. I, II

Varieties of turkeys; breeding practices with turkeys; management and feeding of turkey stock; incubation practices with turkeys; management of poults from hatching to market; special turkey marketing practices; sanitation and disease prevention with turkeys.

308. Hatchery Management. (2-3). Credit 3. II

Commercial hatching in America, early commercial hatcheries, expansion, types of hatchery enterprise, related activities, localization of hatchery business, how and where to start, actual location, hatchery building, inside arrangement, ventilation, heat and temperature control, hatchery equipment, types of incubators; hatchery flock improvement, Texas U. S. plan, sanitation, incubation practices, prices and hatchery costs. Trends in size of hatcheries and causes. Practice consists of culling and blood testing hatchery flocks, putting 5,000 eggs in incubator, fumigating and disinfecting incubator, candling hatching eggs, pedigreeing and judging baby chicks.

309. Broiler Production. (2-2). Credit 3. I

A study of types and breeds for broiler production. Cross breeds, including color of plumage, body conformation, rate of growth, rate of feathering, equipment for broiler production, comparison of colony house, multiple unit, and battery production of broilers including feed cost, weight gains, mortality, culls; time required to produce a 3-pound broiler; marketing wholesale and retail; gross returns and net profit. Fundamentals of chick brooding.

401. Management and Selection. (2-2). Credit 3. I, II †

How to select breeding males and females; culling the farm flock; planning a poultry program for a community with emphasis on good management and soundness of health; how to plan and manage county poultry shows. A thorough study of the National Poultry Improvement Plans, with enough practice work in selecting and testing to qualify students for official Plan participation.

403. Judging. (2-2). Credit 3. I

The judging of standard breeds and varieties; special instructions for judges; methods of fitting and showing birds; types of shows and show management; a study of standard disqualifications and their application to various selection standards; grading of live and dressed market poultry, and of market eggs. Practice work consists of judging classes for production, for market quality, and for exhibition. Several small poultry shows will be judged, and visits made to egg and poultry processing plants and farms of poultry breeders.

407. Technology and Marketing of Poultry and Poultry Products. (2-2). Credit 3. I

A study of the U.S.D.A. grades of eggs, and of live and dressed poultry; preparing poultry for market—killing, dressing, chilling, and packaging; candling, grading, and packing shell eggs; drying and freezing eggs; storage problems and techniques with special emphasis on maintenance of quality during storage; planning poultry and egg plant layouts with special emphasis on meeting U.S.D.A. requirements for sanitation; a study of commercial egg and poultry plants and their operation; newer developments in packaging and merchandising poultry and eggs; effects of feed upon quality and quality retention; a careful study of regulations governing the grading and inspection of poultry of the U. S. Department of Agriculture, with special emphasis on inspection for wholesomeness. Prerequisite: Poultry Husbandry 201.

411. Poultry Feeding. (3-2). Credit 4. I †

The history of poultry nutrition, a short study of the chemical composition of carbohydrates, proteins, fats, vitamins, and mineral mixtures as found in poultry feeds. Composition, functions, sources, and care of vitamins commonly required for efficient poultry feeding. A study of the nutritive value of the different grains, roughages, mill feeds, and protein concentrates used in poultry nutrition. Practice work in feeding of chicks, laying hens, and turkeys. Identification of feeds, the making of complete rations, diagnosis of lack of essentials in poultry rations. Prerequisites: Chemistry 223, 231.

414. Poultry Breeding. (2-2). Credit 3, I †

The basic principles of poultry breeding. The inheritance of characters of economic importance. The records essential for a sound breeding program; the selection of breeders on the basis of records and standard bred characteristics. Practice includes taking records on breeding birds, interpreting the records, and the techniques involved in pedigree breeding. Prerequisite: Genetics 301.

449. Poultry Seminar. (1-0). Credit 1. I

Extensive review of the literature on poultry problems. The student will be required to prepare and present to the class comprehensive reviews of the literature on various phases of poultry husbandry. Each student will be assigned a certain number of technical journals for current reporting to the seminar group. Prerequisite: Senior classification.

450. Poultry Seminar. (1-0). Credit 1. II

Continuation of Poultry Husbandry 449.

FOR GRADUATES

603. Principles and Practices of Incubation. (3-3). Credit 4. I

A study of the developmental stages of the chick during incubation. Correlation of development with genetic and environmental factors. Study of the fundamental principles underlying successful artificial incubation of eggs. Relation of egg characters to hatchability. Effects of pre-incubation treatment on hatchability of chicken and turkey eggs. Control of disease during the incubation process. Relation of maternal diet to embryonic development and hatchability of the chick. Prerequisite: Poultry Husbandry 308 or equivalent.

604. Principles of Brooding and Rearing. (3-3). Credit 4. II

A study of principles involved in the brooding of poultry. Relative cost and efficiency of different brooding methods. Relation of brooding practice to growth and livability of chicks and poults. Relation of diet to growth and mortality during the brooding period. Optimum levels of protein, minerals, and vitamins necessary to avoid malformation and to attain good growth. Prerequisites: Poultry Husbandry 201 and 303, or equivalent.

611. Poultry Processing, Storing, and Distribution. (3-0). Credit 3. II

A study of egg quality and of egg quality maintenance. Effects of storage on egg and meat quality. The latest methods of processing eggs and poultry; feeding of market birds to improve grade; costs of production for various areas, and for various sized flocks and methods of management; planning optimum sized units for economical production. Prerequisites: Agricultural Economics 314 or equivalent; Poultry Husbandry 407 or the equivalent.

612. Laboratory Problems in Poultry Processing, Storing and Distribution. (0-3). Credit 1. II

A survey of improved methods of processing poultry and eggs. Certain selected modern processing plants will be visited and a study made of operating methods. Students may assist with experimental work in progress on poultry and egg processing and storage. Laboratory comparisons of various methods of fattening and their effects on market and storage quality of fowl will be made. Effects of temperature and methods of dressing on market and storage quality will be studied. Prerequisite: Poultry Husbandry 611 or registration therein.

613. Breeding and Genetics of Poultry. (3-3). Credit 4. II

Rapid and intensive survey of the mode of inheritance of the most important morphological and physiological characters in poultry. Analysis of the comparative efficiency of various systems of breeding in the improvement of poultry. Scientific journals and technical literature reviewed. Research methods discussed. Prerequisite: Poultry Husbandry 414 or the equivalent.

681. Seminar. (1-0). Credit 1 each semester. I, II

Intensive review and reporting of literature on poultry feeding, breeding, incubation, marketing, and management problems. Development of familiarity not only with literature but with organizations, agencies, and personnel working with poultry problems. Prerequisite: Graduate classification. May be repeated as many semesters as desired but maximum of two credits allowed towards Master's degree.

685. Problems. Credit 1 to 6 each semester. I, II

An intensive study of newer principles and methods in the various specialized fields related to successful poultry production. Prerequisite: Approval of the Head of the Department.

691. Research. Credit 1 or more each semester. I, II

Intensive study of research methods and techniques in poultry breeding, nutrition, physiology, or physical aspects of marketing. Students will be required to carry out some experimental project in one of these fields. Reviews of specific literature, collection, analysis, and presentation of experimental data will be stressed. Designed for thesis credit.

Department of Range and Forestry

Professor V. A. Young,
Professors R. A. Darrow, O. E. Sperry; Associate Professors F. W. Gould; Assistant Professors R. R. Rhodes, G. W. Thomas, W. J. Waldrip

202. Range Plants. (2-3). Credit 3. I

Native forage plants of the ranges of the United States. Determination, distribution, ecology, and economic value, especially in Texas, are considered. Poisonous plants and range practices to avoid livestock losses are included. Prerequisite: Biology 102 or the equivalent.

301. Plant and Range Ecology. (2-3). Credit 3. I, II †

An analysis of habitat factors as they influence plant growth. Attention is given plant succession, competition, distribution, and detailed methods of studying and mapping vegetation. Prerequisite: Biology 102.

303. Agrostology. (2-3). Credit 3. I, II †

A fundamental study of grasses, especially those of economic importance in Texas. A study of the characteristics of the various genera and species of grasses, their identification, distribution, propagation, improvement, and management with particular reference to their use and value in Texas ranges and pastures. Prerequisite: Biology 102 or equivalent.

304. Range Management. (2-3). Credit 3. I †

A technical course dealing with problems met in managing native range lands, including a study of grazing regions and the problems of each; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management as it affects vegetation. Field trips. Prerequisite: Range and Forestry 202 or 303.

307. Elementary Forestry. (2-3). Credit 3. I

A general survey of the field of forestry, with identification of the principal trees of this section, log tree and stand measurement; grazing as applied to forestry, the elementary forest operations and practice. Relation of forestry to allied phases of agriculture and functions of forestry in land-use planning.

308. Farm Forestry. (2-3). Credit 3. II

Management of farm woodlands and woodlots for the production of fuel, posts, and merchantable products; seasoning, preservation, and use of wood products; windbreak and shelterbelt planting forestry in relation to grazing and economics of agriculture. Field trips.

309. Silvics and Silviculture. (2-3). Credit 3. I

A study of the factors of site, their influence on tree growth and reciprocal effect on site; silvicultural cutting systems, cultural operations, and the silvicultural characteristics of the more important commercial species of the South and Southwest. Field trips. Prerequisite: Range and Forestry 307 or 308.

310. Forest Products and Utilization. (2-2). Credit 3. II

Utilization of the products of farm woodlots, woodlands, and commercial forests; the manufacture and utilization of lumber, timber, and other wooden products, including mechanical properties, lumber grades, timber fasteners, and the use of glues. Also the identification of certain woods important in agricultural and commercial enterprises of the South and Southwest. Field trips.

311. Management of Range Resources. (2-3). Credit 3. II

A general course for students majoring in veterinary medicine, emphasizing identification of range species, physiology of plant responses to grazing, control of noxious plants, grazing systems, and range management practices for general conservation.

401. Range Improvement and Maintenance. (2-3). Credit 3. I, II

A general course for students not majoring in range management. A study of native forage and poisonous plants on the ranges of Texas. Evaluation and analysis of range lands, grazing systems, livestock handling problems, physiology of plant responses to grazing and range management. Especial emphasis on Texas conditions. Field trips.

407. Range Practice. Credit 3. II, S †

A travel course to selected regions for observation and study of range and pasture land. Required for all range management majors. Others by approval of instructor.

408. Range Problems. Credit 1 to 3. I, S †

Individual study and research upon a selected range problem approved by instructor.

409. Advanced Range Management. (2-3). Credit 3. II †

A technical course dealing with the more advanced problems in managing native range lands. Special attention will be given to the study of the development of the range industry, cost of production, range land utilization, organization of cattle, sheep, and goat industry; and range condition classes. Field trips. Prerequisite: Range and Forestry 304 or 401 with approval of instructor.

411. Field Range Management. Credit 2 or 3. S †

A semi-technical summer field course in which emphasis is placed upon identification of important range plants; determination of vegetation types, sub-types, forage utilization values, range condition classes, mapping; brush eradication and control, and proper distribution of livestock. A summer field course primarily for county agricultural agents and vocational agricultural teachers, others by approval of instructor.

412. Range Management Practices. (2-3). Credit 3. I, II

A continuation of Range and Forestry 401 in which special emphasis is placed on range condition classes as developed by mismanagement of grazing lands, succession trends, range and ranch management plans, and economic principles associated with handling of livestock on ranges. Prerequisite: Range and Forestry 401.

FOR GRADUATES

605. Range Research Methods. Credit 2. I

A study of research methods in range management and related subjects. A review of scientific investigation in the field and analysis of results. Prerequisite: Graduate majors in range and forestry.

606. Range Economics. (2-0). Credit 2. II

Range management practices, land utilization, and ranch operation as they affect economics of livestock industry and the nation. Prerequisite: Graduate majors and minors in range and forestry.

607. Vegetation Influences. (3-0). Credit 3. I

Interrelationships between ecological factors and vegetation, influence of forest and range vegetation on watershed management and soil conservation. Field trips to be arranged. Prerequisite: Range and Forestry 301. (Offered in 1955-56 and in alternate years thereafter)

609. Plant and Range Ecology. (2-3). Credit 3. II

A detailed study of plant communities, successions, and the effect of various degrees of utilization in vegetation types and edaphic factors. Prerequisite: Range and Forestry 301 or equivalent. (Offered in 1954-55 and in alternate years thereafter)

610. Range Grasses and Grasslands. (2-3). Credit 3. II

A study of range grasses as applied to utilization and sustained production. The ecological characteristics and geographical features of the native grasslands. Ecological principles as applied to range problems. Individual problems to be assigned. Prerequisites: Range and Forestry 301, 303; approval of Head of Department.

611. Control of Noxious Range Plants. (3-0). Credit 3. I

An advanced study of native and naturalized noxious and poisonous plants on Texas ranges that are detrimental to good management practices. Their distribution, reproduction, dissemination, and methods and practices of control will be stressed in relation to conservation and economic importance. Field trips to be arranged. (Offered in 1954-55 and in alternate years thereafter)

612. Range Management Practices, Policies, and Administration. (3-0). Credit 3. I

Advanced studies dealing with technical range management problems, social and economic background of legislation and policies developed in the acquisition and administration of national, state, and private range properties. Field trips to be arranged. Prerequisite: Range and Forestry 409 or equivalent. (Offered in 1955-56 and in alternate years thereafter)

681. Seminar. (1-0). Credit 1 each semester. I, II

Current scientific work in range management and related subjects in American and foreign fields. Prerequisite: Majors and minors in range and forestry.

685. Problems. Credit 1 to 4 each semester. I, II, S

A course designed for investigations not included in the student's research for thesis or dissertation. Problems may be selected in applied ecology, range management or forestry. Lectures, conferences, field work, reports. Prerequisite: Graduate majors or minors in range and forestry.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis or dissertation. Prerequisite: Graduate majors in range and forestry.

Religious Education

(See page 77)

Department of Veterinary Anatomy

Professor J. H. Milliff;
Assistant Professors L. W. Gibbs, A. A. Price

301. Veterinary Anatomy. (1-12). Credit 5. I

The osteology of the domestic animals, and topographical dissection of the dog.

302. Veterinary Anatomy. (1-12). Credit 5. II

Topographical dissection of the horse. Prerequisite: Veterinary Anatomy 301.

303. Veterinary Histology. (2-4). Credit 3. I

A microscopic study of the basic tissues, including the blood, and of the body organs, excluding the genitalia, central nervous system, and the eye.

304. Veterinary Embryology. (2-4). Credit 3. II

A microscopic study of the central nervous system, the eye, and genitalia, followed by dissection and microscopic examination of the developing embryo and its membranes, from conception to birth. The pig is used as a type animal. Prerequisite: Veterinary Anatomy 303.

305. Neuroanatomy. (0-6). Credit 2. II

Gross and microscopic study of the nervous systems of the domestic animals with special reference to the sheep and the cat. Prerequisite: Veterinary Anatomy 303 or approval of Head of Department.

401. Veterinary Anatomy. (0-6). Credit 2. I

The comparative anatomy of the cow, sheep or goat, pig, cat, chicken, and turkey. Prerequisite: Veterinary Anatomy 302.

FOR GRADUATES

685. Problems. Credit 1 to 4 each semester. I, II, S

Problems in either gross or microscopic anatomy along lines to be chosen by the individual. Prerequisites: Veterinary Anatomy 401; approval of the Head of the Department.

Department of Veterinary Bacteriology and Hygiene

Professor J. P. Delaplane,
Professor F. P. Jaggi, Jr.; Associate Professors W. C. Banks, W. A. Boney, L. C. Grumbles*; Instructors E. E. Roth, F. K. Wills

334. Poultry Pathology. (2-2). Credit 3. II

Poultry sanitation and diseases. Prevention and control of environmental, nutritional, parasitic, and contagious diseases. Prerequisites: Biology 206; Veterinary Physiology and Pharmacology 329.

435. Veterinary Bacteriology and Immunology. (3-4). Credit 4. I

The principles of bacteriology and immunology. Emphasis is placed on the general morphology, physiology, and immunologic reactions of microorganisms important in veterinary medicine. Special attention is given to the biologics in the diagnosis and treatment of infectious diseases. Prerequisites: Biochemistry and Nutrition 312; Veterinary Anatomy 302, 303.

436. Special Veterinary Bacteriology. (2-4). Credit 3. II

A study of the general staining procedures, cultural methods and media preparation for bacteria; and the morphology, cultural characteristics, and pathogenicity of microorganisms which produce diseases in domestic animals and man. Prerequisites: Veterinary Pathology 443; Veterinary Physiology and Pharmacology 425.

437. Virology. (2-4). Credit 3. I †

The study of ultramicroscopic infectious agents of man and animal; theories of infection, methods of isolation, filtration, and tissue cultivation. Practice consists of exercises in filtration, centrifugation, lyophiling, tissue cultivation, and animal inoculation. The course is designed for students majoring in bacteriology. Prerequisite: Biology 455 or Veterinary Bacteriology and Hygiene 436.

491. Animal Hygiene. (2-2). Credit 3. I, II

This course deals with livestock sanitation and the prevention, control, and eradication of diseases of farm and ranch animals. Prerequisites: Biology 206; Veterinary Physiology and Pharmacology 329; senior classification in agriculture.

536. Infectious Diseases. (5-0). Credit 5. II

A study of the bacterial, rickettsial, viral, and protozoal diseases of farm and ranch animals (bovine, equine, ovine, caprine, and porcine). Public health aspects of the various intertransmissible diseases of animal and man are stressed. Prerequisite: Junior classification in Veterinary Medicine.

591. Food Hygiene. (2-2). Credit 3. I

The antemortem and postmortem inspection of food animals, and inspection of foods of animal origin; laws, ordinances, and regulations governing animal food products including sanitary requirements. Prerequisites: Dairy Husbandry 313; Veterinary Bacteriology and Hygiene 536.

592. Veterinary Public Health. (2-0). Credit 2. II

The relation of the veterinarian and veterinary problems to public health. Prerequisite: Veterinary Bacteriology and Hygiene 591.

*On leave of absence.

595. Veterinary Poultry Pathology and Bacteriology. (3-2). Credit 4. I

The pathology of diseases of poultry will be considered from clinical, pathological, bacteriological, and parasitological standpoints. Prevention, control, and treatment will also be given consideration. Prerequisite: Senior classification in Veterinary Medicine.

596. Veterinary Poultry Pathology and Bacteriology. (3-2). Credit 4. II

The pathology of diseases of poultry will be considered from clinical, pathological, bacteriological, and parasitological standpoints. Prevention, control, and treatment will also be given consideration. Prerequisite: Senior classification in Veterinary Medicine.

FOR GRADUATES

601. Food Hygiene. (3-4). Credit 4.

The study of causes and evidence of spoilage, and the detection of adulterants in fresh, canned, and cured foods of animal origin. Prerequisite: Veterinary Bacteriology and Hygiene 591 or 592.

643. Veterinary Bacteriology. (3-4). Credit 4. I, II

A study of the pathogenic microorganisms; their cultural and biological characteristics and pathogenicity.

646. Avian Virus Diseases. Credit 1 to 4. I, II

A study of the viral diseases of poultry including methods of isolation and identification of the causative agents. Practice consists of conducting post mortem examinations and special diagnostic procedures on birds received daily for necropsy. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

647. Veterinary Virology. Credit 1 to 4. I, II

A detailed study of virus infections in animals, including types of infections, mode of transmission, intracellular pathology, epidemiology, isolation and identification of the inciting agents. Practice includes tissue cultivation, animal inoculations, and diagnostic tests. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

648. Veterinary Mycology. Credit 1 to 4. II

A study of actinomycetes, yeasts, and molds that are pathogenic to man and animals; the morphology, cultural characteristics, pathogenicity and indentification. Practice consists of exercises in cultural methods, morphological characteristics, biochemical reactions and diagnosis. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

685. Problems. Credit 1 to 4 each semester. I, II

Problems course in bacteriology, virology, hygiene, and hematology. Prerequisite: Degree of Doctor of Veterinary Medicine. (May be taken for undergraduate credit with permission of the Head of the Department.)

691. Research. Credit 1 to 8. I, II

An original problem in veterinary bacteriology and hygiene. This research to be reported by a thesis as partial requirement for the Master of Science Degree. Prerequisite: Admission to candidacy for Master of Science degree.

Department of Veterinary Medicine and Surgery

Professor A. A. Lenert,
Professor H. E. Redmond; Associate Professor C. W. Zahn; Assistant Professors W. W. Kirkham, F. C. Neal; Instructor J. P. Davis; W. W. Armistead, Dean of Veterinary Medicine, Lecturer; R. J. Beamer, Lecturer

511. Veterinary Radiology. (1-0). Credit 1. I

Fundamentals of veterinary radiography, fluoroscopy, x-ray and radioisotope therapy with interpretation of radiographs and fluoroscopic examinations and essential protection from radiation. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Pathology 444.

512. Veterinary Radiology. (1-0). Credit 1. II

Fundamentals of veterinary radiography, fluoroscopy, x-ray and radioisotope therapy with interpretation of radiographs and fluoroscopic examinations and essential protection from radiation. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Pathology 444.

513. Veterinary Medicine. (3-0). Credit 3. I

Non-infectious diseases, lectures and demonstrations on physical diagnosis, diseases of the digestive, circulatory, respiratory, genito-urinary organs, nervous sytsem, and the skin. Prerequisites: Veterinary Pathology 444; Veterinary Physiology and Pharmacology 527 or registration therein.

514. Veterinary Nutritional Pathology. (2-0). Credit 2. II

Lectures and demonstrations stressing the pathology of nutritional disturbances and intoxications. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Medicine and Surgery 513; registration in Veterinary Physiology and Pharmacology 530.

515. General Surgery. (5-0). Credit 5. I

The principles of surgery and anesthesia of domestic animals, surgical diagnosis, castration and spaying, dentistry, horseshoeing Prerequisite: Veterinary Pathology 443.

516. Veterinary Operative Surgery. (3-4). Credit 4. II

Consideration of surgical procedures, lameness, unsoundness in animals. Surgical exercises are required. Prerequisite: Veterinary Medicine and Surgery 515.

517. Veterinary Obstetrics and Genital Diseases. (3-2). Credit 4. I

Mechanics of veterinary obstetrical operations; prevention and treatment of diseases incident to or affecting breeding, conception, gestation, parturition, and postparturient convalescence of common domestic animals; prevention and treatment of diseases of the newborn; theory and technique of artificial insemination. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Medicine and Surgery 513 or registration therein.

518. Veterinary Obstetrics and Genital Diseases. (3-0). Credit 3. II

Mechanics of veterinary obstetrical operations; prevention and treatment of diseases incident to or affecting breeding, conception, gestation, parturition, and postparturient convalescence of common domestic animals; prevention and treatment of diseases of the newborn; theory and technique of artificial insemination. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Medicine and Surgery 513 or registration therein.

519. Veterinary Clinics. (0-3). Credit 1. I

Clinical orientation, restraint, administration of medicines, physical examination, methods of collecting specimens for laboratory purposes. Prerequisite: Veterinary Medicine and Surgery 513 or registration therein.

520. Veterinary Clinics. (0-6). Credit 2. II

Consideration of hospital cases including discussion, examination, application of clinical methods for establishing diagnosis, methods of treatment, handling, and aftercare. Prerequisite: Veterinary Medicine and Surgery 519.

522. Non-Infectious Diseases of Small Animals. (2-0). Credit 2. II

Non-infectious and nutritional diseases of pet animals, fur-bearing animals, and laboratory animals. Prerequisites: Veterinary Pathology 444; Veterinary Physiology and Pharmacology 528 or registration therein.

551. Methods of Veterinary Practice. (3-0). Credit 3. I, II †

Detailed study of hospital planning, practice management and promotion, and veterinary ethics. Prerequisite: Veterinary Medicine and Surgery 520 or the equivalent.

553. Small Animal Practice. (3-0). Credit 3. I

Small animal obstetrics, pediatrics, geriatrics, and orthopedics; infectious diseases of small animals; small animal hospital management. Prerequisite: Veterinary Medicine and Surgery 522.

555. Veterinary Clinics. (0-24). Credit 8. I

Students are required to assume full responsibility for the diagnosis, care, and treatment of patients assigned under the supervision of instructors. An ambulatory clinic is maintained whereby students get experience under actual farm and ranch conditions as well as with various animals belonging to the College. Clinical laboratory diagnosis is stressed and autopsies are conducted. Clinical parasitology and pharmacology are included. All classes of large and small animals and poultry are utilized. Prerequisites: Veterinary Bacteriology and Hygiene 536; Veterinary Medicine and Surgery 516, 520.

556. Veterinary Clinics. (0-24). Credit 8. II

Continuation of Veterinary Medicine and Surgery 555. Prerequisite: Veterinary Medicine and Surgery 555.

557. Veterinary Nutritional Pathology. (2-0). Credit 2. I

Lectures and demonstrations stressing the pathology of nutritional disturbances and intoxications. Prerequisites: Veterinary Bacteriology and Hygiene 436; Veterinary Medicine and Surgery 513; registration in Veterinary Physiology and Pharmacology 571.

558. Veterinary Clinical Seminar. (1-0). Credit 1. II

For senior veterinary students. Presentation and discussion of clinical animals including clinical laboratory diagnosis, clinical parasitology, and clinical pharmacology. Prerequisite: Veterinary Medicine and Surgery 555.

559. Veterinary Clinics. (0-6). Credit 2. S

Veterinary clinics. Prerequisite: Veterinary Medicine and Surgery 520.

FOR GRADUATES

603. Veterinary Surgery. Credit 1 to 8 each semester. I, II

Special surgery of large or small animals. Prerequisite: Degree of Doctor of Veterinary Medicine or appropriate specialized training.

685. Problems. Credit 1 to 8 each semester. I, II

Original investigations of problems in the field of surgery or therapeutics. Prerequisite: Degree of Doctor of Veterinary Medicine or appropriate specialized training.

691. Research. Credit 1 or more each semester. I, II

Research for thesis.

Department of Veterinary Parasitology

Professor R. D. Turk;
Instructor R. R. Bell

481. Parasites of Domestic Animals. (2-2). Credit 3. I

Internal parasites of farm, ranch, pet, and furbearing animals. Attention is given to symptoms, diagnosis, treatment, control and eradication of parasitic diseases. Practice consists of a study of the morphology of parasites. Laboratory and diagnostic methods used in parasitology; the pathology of parasitism. Both fresh and preserved material obtained from the field, clinics, and necropsies are utilized in the laboratory. Prerequisite: Veterinary Anatomy 302.

482. Parasites of Domestic Animals. (2-2). Credit 3. II

The protozoan and external parasites of farm, ranch, pet, and fur-bearing animals. Attention is given to diagnosis, prevention, treatment, and control of parasitic disease caused by protozoa and external parasites. Practice consists of study of morphology of parasites and laboratory and diagnostic methods used in parasitology and pathology of parasitism. Both fresh and preserved material from the field, clinic, and necropsies are utilized in the laboratory. Prerequisite: Veterinary Parasitology 481.

484. Diseases of Wildlife. (2-2). Credit 3. II †

A study of the diseases and parasites of wild animals including mammals, birds, and fish. Prerequisites: Biology 206; Entomology 201; senior classification in wildlife management. For students of veterinary medicine: Veterinary Parasitology 482 or 587; Wildlife Management 201.

486. Parasites of Domestic Animals. (2-2). Credit 3. II

Internal parasites of farm, ranch, pet, and fur-bearing animals. Attention is given to symptoms, diagnosis, treatment, control, and eradication of parasitic diseases. Practice consists of a study of the morphology of parasites. Laboratory and diagnostic methods used in parasitology; the pathology of parasitism. Both fresh and preserved material obtained from the field, clinics, and necropsies are utilized in the laboratory. Prerequisite: Veterinary Anatomy 302.

587. Parasites of Domestic Animals. (2-2). Credit 3. I

The protozoan and external parasites of farm, ranch, pet, and fur-bearing animals. Attention is given to diagnosis, prevention, treatment, and control of parasitic disease caused by protozoa and external parasites. Practice consists of study of morphology of parasites and laboratory and diagnostic methods used in parasitology and pathology of parasitism. Both fresh and preserved material from the field, clinic, and necropsies are utilized in the laboratory. Prerequisite: Veterinary Parasitology 486.

FOR GRADUATES

601. Veterinary Parasitology. Credit 1 to 4 each semester. I, II

A detailed study of the more important helminth parasites of domestic animals, including their identification, distribution, and life history. Prerequisite: Veterinary Parasitology 482 or 587, or the equivalent.

603. Diseases of Wild Game. (2-2). Credit 3. I, II

A study of the diseases of wild animals including mammals, birds, and fish. Prerequisites: Biology 218, 343; Entomology 201; Wildlife Management 401 or 402.

685. Problems. Credit 1 to 4 each semester. I, II, S

Special problems concerned with the parasites of domestic animals or poultry. Prerequisites: Veterinary Parasitology 601 or the equivalent; approval of the instructor.

691. Research. Credit 1 or more each semester. I, II, S

Research for thesis.

Department of Veterinary Pathology

Professor H. A. Smith,
Professors I. B. Boughton, H. Schmidt; Assistant Professors
D. F. Johnson, Jr., T. A. Blackburn

443. Veterinary General Pathology. (4-3). Credit 5. I

The elementary disease processes and their causes, including a study of the gross and minute appearance of the diseased tissue. Such processes as inflammation, necrosis, gangrene, atrophy, hypertrophy, ulceration, the various degenerations, infiltrations, pigmentations, and tumor formations are considered. Practice consists of the microscopic study of these processes and instruction in laboratory technique. Prerequisites: Veterinary Anatomy 302, 304.

444. Veterinary Special Pathology. (4-4). Credit 5. II

Lectures on special pathology of organs and systems. Infectious and non-infectious diseases are considered. The mechanism of development of lesions and their relationship to clinical symptoms is emphasized. Lectures are illustrated liberally with color slides. Laboratory work consists of studies in gross and microscopic pathology. Prerequisite: Veterinary Pathology 443.

445. Problems in Veterinary Pathology. Credit 1 to 4 each semester. I, II

An elective course for undergraduates who wish to supplement the standard required courses. Problems can be assigned in gross or microscopic pathology or in pathological technique. By special arrangement it may be possible to substitute work done in this course for certain of the postmortem laboratory requirements in Veterinary Medicine and Surgery 555, 556. Prerequisites: Veterinary Pathology 443; approval of the instructor.

FOR GRADUATES

643. Gross Pathology. Credit 1 to 6. I, II, S

The student studies gross pathological changes at the necropsies performed daily. He then follows selected tissues through suitable histopathological techniques and corrects his gross diagnosis in the light of the microscopic findings. Confirmatory bacteriologic methods are utilized where indicated. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

644. Locomotor and Skeletal Diseases. Credit 1 or 2. I, S

The changes taking place in diseased bones, joints, and muscles are studied with respect to their nature and probable causes, and with especial reference to lameness of the horse. Frequent use is made of the unsurpassed Mark Francis Collection of Bone and Joint Pathology. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

645. Neoplastic Diseases. Credit 1 to 8. I, II, S

Theoretical, histopathological, and clinical aspects of neoplasms. Diagnosis of neoplastic and related conditions in all species. Prerequisite: Degree of Doctor of Veterinary Medicine or the equivalent.

646. Nutritional Diseases. Credit 2 to 4. II

Gross and miscroscopic tissue changes to be found in experimentally produced nutritional deficiencies are considered in comparison with clinically encountered deficiencies and with other conditions from which they must be differentiated. Prerequisite: Degree of Doctor of Veterinary Medicine or other suitable preparation.

647. Metabolic Diseases. Credit 1 or 2. S

The pathology of diseases due to major disorders of metabolism, non-nutritional and non-infectious. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

648. Reproductive Diseases. Credit 1 to 4. S

Theoretical and practical pathology of gross and microscopic lesions in the reproductive organs with especial reference to bovine sterility. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

650. Neuropathology of Animals. Credit 1 to 4. I, S

In addition to the study and interpretation of gross and microscopic lesions of the central and peripheral nervous systems, major attention is given in theory and in practice to the special laboratory techniques necessary to demonstrate such lesions. Prerequisite: Degree of Doctor of Veterinary Medicine or equivalent.

658. Pathological Technique. Credit 1 to 6. I, II, S

The art and science of preparing animal tissues, fluids, and exudates for microscopic or other special examination. Enrollment is limited to the number who can be accommodated in the routine of the departmental laboratory. Prerequisite: A fair knowledge of general chemistry.

659. Sheep Diseases. Credit 1 to 4. I

The pathology, etiology, and symptomatology of the economically important diseases affecting sheep in all of the major sheep-producing countries of the world. Prerequisite: D.V.M. degree or the equivalent.

691. Research. Credit 1 or more each semester. I, II, S

Research to be reported by the writing of a thesis or dissertation as a partial requirement for the M.S. or Ph.D. degree.

Department of Veterinary Physiology and Pharmacology

Professor P. W. Burns;
Assistant Professor R. H. Davis; R. O. Berry, Professor of Animal Husbandry, Lecturer on Physiology of Reproduction

329. Physiology of Farm Animals. (2-2). Credit 3. I, S

A consideration of physiology and anatomy essential to an understanding of diseases of farm animals. Limited to majors in animal husbandry, dairy husbandry, and poultry husbandry. Prerequisite: Chemistry 231.

425. Veterinary Physiology. (2-6). Credit 4.* I

Functions of the circulatory and respiratory systems. The mechanics of digestion. Absorption and excretion; the kidneys and skin. Prerequisites: Biochemistry and Nutrition 312; Veterinary Anatomy 302, 303, registration in 401.

*Becomes (3-6), credit 5, effective September 1, 1955.

426. Veterinary Physiology. (3-3). Credit 4. II

Functions of the muscular, nervous, and reproductive systems. Milk secretion and functions of the endocrines. Prerequisites: Veterinary Anatomy 401; Veterinary Physiology and Pharmacology 425.

527. Veterinary Pharmacology. (3-0). Credit 3. I

Metrology; history of pharmacodynamics; sources and composition of drugs; pharmaceutic preparations and methods; prescription writing; methods of drug administration; factors influencing the action of drugs; posology; drugs that alter respiration; antibiotics; drugs that affect the digestive tract, circulatory stimulants; antipyretics. Prerequisite: Veterinary Physiology and Pharmacology 426.

528. Veterinary Pharmacology. (2-3). Credit 3. II

General and local anesthetics; vitamin and endocrine therapy; agents used topically; drugs acting on the genito-urinary system; the central and peripheral nervous system. The practice includes chemical, pharmaceutic, and biologic assay methods; actions of drugs on experimental animals. Prerequisite: Veterinary Physiology and Pharmacology 527.

530. Veterinary Toxicology. (1-2). Credit 2. II

Occurrence, symptoms, lesions, prevention, and treatment of poisoning by organic and inorganic poisons and poisonous plants. Practice consists of analyses of the more common organic and inorganic poisons; actions and treatment of poisons on experimental animals. Prerequisites: Range and Forestry 311; Veterinary Physiology and Pharmacology 527, 528 or registration therein.

571. Veterinary Toxicology. (1-2). Credit 2. I

Occurrence, symptoms, lesions, prevention, and treatment of poisoning by organic and inorganic poisons and poisonous plants. Practice consists of analyses of the more common organic and inorganic poisons; actions and treatment of poisons on experimental animals. Prerequisites: Range and Forestry 311; Veterinary Physiology and Pharmacology 527, 528 or registration therein.

FOR GRADUATES

601, 602. Animal Physiology. (3-3). Credit 4 each semester. I, II

Recent phases of physiology; modern experimental methods. The work is arranged to suit the needs of the student and in harmony with his previous training. Prerequisite: Basic courses in morphology and organic chemistry.

605, 606. Poisonous Plants. (3-3). Credit 4 each semester. I, II

Original investigations and detailed studies of poisonous plants and their effects on domestic animals. Prerequisite: Veterinary Physiology and Pharmacology 530 or 571.

607, 608. Veterinary Pharmacology. (3-3). Credit 4 each semester. I, II

Modern methods of research in pharmacology and pharmaceutical processes. Original research in studying the actions and uses of drugs. Prerequisites: Veterinary Physiology and Pharmacology 527, 528.

611, 612. Veterinary Physiology. (3-3). Credit 4 each semester. I, II

A detailed study of specific phases of physiology of domestic animals. Prerequisites: Veterinary Anatomy 303, 304, 401; Veterinary Physiology and Pharmacology 426.

Department of Wildlife Management

Professor W. B. Davis;
Assistant Professors K. L. Dixon, G. K. Reid, Jr.

201. Wildlife Conservation and Management. (3-0). Credit 3. I, II

An introduction to the wildlife resources of the United States with special reference to Texas. The importance of plants and animals in our economic and cultural life. An account of what has happened to North American wildlife with consideration of specific plans and methods for its rehabilitation, maintenance, and increase.

202. Natural History of the Vertebrates. (2-2). Credit 3. II

Natural history of fishes, amphibians, reptiles, birds and mammals, as exemplified by selected representatives of each group. Not open to wildlife management majors.

300. Field Studies. Credit 4. S

Wildlife survey of selected areas. Studies of plant-animal interrelationships, birds, mammals, and other native vertebrates; experience in collecting and preparing study skins of birds, mammals; reptiles and amphibians. Prerequisite: Junior classification.

304. Conservation and Management of Fishes. (3-0). Credit 3. II

The classification, habits, economic importance, and conservation of fishes.

311. Ichthyology. (Fresh Water). (2-3). Credit 3. I †

This course is designed to familiarize the student with the fresh-water fishes of the world. The approach to the subject matter will be mainly systematic, but the evolution, ecology, life history and economy of the more important species will be treated. The fresh-water fishes of Texas will be emphasized and the practice will consist of the identification of 75-100 fish. Prerequisite: Biology 107.

312. Ichthyology. (Marine). (2-3). Credit 3. II †

A study of the marine fishes of the world, emphasizing fishes of Texas. Life history, ecology, distribution, evolution, and economic values of important species will be treated. Prerequisite: Biology 107. (Offered in 1955-56 and in alternate years thereafter)

315. Herpetology. (2-2). Credit 3. II †

An introduction to the study of the structure, adaptation, classification, distribution, and economic importance of amphibians and reptiles. Prerequisite: Biology 107.

316. Field Herpetology. (0-3). Credit 1. II

Field work involving the collection and preservation of herpetological specimens; natural history; ecological relations. Prerequisites: Wildlife Management 315 or registration therein.

400. Fisheries Survey. Credit 4. S

A field course. Attention will be given to the life histories, ecology, and propagation of fishes important for sporting and food purposes. Distribution, identification, and field techniques. Prerequisite: Junior classification. (Offered in 1956)

401. General Mammalogy. (2-2). Credit 3. I †

Study of the structure, classification, and economic relations of mammals. Foundation for wildlife management, also for museum work. Prerequisite: Biology 107.

402. General Ornithology. (2-2). Credit 3. II †

Introduction to the study of birds, their structure, classification, geographic distribution, ecologic relations, and economic status. Foundation for wildlife management, also for museum work. Prerequisite: Biology 107.

403. Ecology of Animals and Plants. (2-3). Credit 3. I †

Animal-plant interrelationships. The web of life. The importance of taking full account of animal, plant, and environment. The place in wildlife management of action and reaction, zonation, succession, numbers, limiting factors, biological control, the balance of nature. A basic course. Prerequisite: Range and Forestry 301.

408. Techniques of Wildlife Management. (2-3). Credit 3. II †

Methods and techniques in maintaining and increasing desirable wildlife and regulating population generally, with emphasis on practical aspects. Use of natural vegetation, the place and methods of census, restocking, game preserves, predatory animal control, provision of food and cover, farmer-sportsman relations, significance of succession, and other ecologic concepts to game management and related enterprises. Prerequisite: Senior classification in wildlife management or approval of instructor.

413. Limnological Techniques. (1-3). Credit 2. S †

Treats the history, efficiency, and practicability of the various methods and apparatus in use in limnological studies. Field trips will be made to ponds and streams to sample populations of fishes, bottom fauna, and plankton and to make chemical and physical analyses of the water. Prerequisite: Junior classification. (Offered in 1956)

414. Limnology. (3-0). Credit 3. II †

A theory course in which the limnological aspects of ponds, streams, reservoirs, and lakes are discussed. Emphasis is placed upon the effect of physio-chemical factors on populations of aquatic plants and animals plus the inter-biotic relationships so that a sound foundation can be laid for management policies. Successful and unsuccessful management efforts will be examined. Prerequisite: Senior classification in fisheries option or approval of instructor. (Offered in 1955-56)

417. Biology of Fishes. (2-2). Credit 3. I †

Treats the biology of fishes, including respiration, sense organs, feeding habits, breeding habits, anatomy, and adaptations to the environment. Emphasis will be placed upon the various physiological and morphological features of fishes, particularly as they relate to problems of distribution, populations, and management in Texas. Prerequisite: Biology 107. (Offered in 1955-56)

490. Wildlife Problems. Credit 1 to 3. I, II

Individual study and research on a selected problem approved by the instructor. Prerequisite: Senior classification.

FOR GRADUATES

601, 602. Vertebrate Systematics. (1-6). Credit 3 each semester. I, II

The theory and practice of taxonomy as applied to vertebrates. Laboratory consists of individual problems on classification and distribution of selected groups of vertebrates; problems in nomenclature of birds, mammals, fishes, and reptiles, based on Texas Cooperative Wildlife Collection. Survey of the literature of vertebrate taxonomy as related to the group selected; a study of vertebrate material from the systematic standpoint. Prerequisites: Wildlife Management 311, 315, 401, or 402, depending on group selected. (Offered in 1954-55)

603. Vertebrate Ecology. (1-6). Credit 3. II

The ecology and life histories of vertebrates with special reference to birds and mammals. The role of native vertebrates in relation to range, forest, and farm problems. Consideration will be given to community and environmental relations. Prerequisite: Wildlife Management 403 or equivalent. (Offered in 1954-55)

608. Techniques of Wildlife Management. (2-0). Credit 2. II

Special techniques and current development in wildlife management practices. Prerequisite: Wildlife Management 408 or equivalent. (Offered in 1954-55)

609. Wildlife Research Methods. (2-0). Credit 2. I

A study of research methods as applied to wildlife management. (Offered in 1954-55)

681. Seminar. (1-0). Credit 1 each semester. I, II

Important current developments in the wildlife field with special reference to the literature. Prerequisite: Senior or graduate classification.

685. Problems. Credit 2 to 6 each semester. I, II

Credit to be adjusted in accordance with requirements of each individual case.

691. Research. Credit 1 or more each semester. I, II

Original research on selected wildlife problem to be used in thesis or dissertation.

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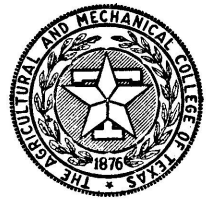

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