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BULLETIN OF
THE UNIVERSITY OF WISCONSIN

GENERAL ANNOUNCEMENT OF COURSES

1932-33

(CATALOG 1931-32)

PUBLISHED BY THE UNIVERSITY
MADISON—JULY, 1932

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of the
University of Wisconsin

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University of Wisconsin
Series 5/00/1
Vol.
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MADISON
PUBLISHED BY THE UNIVERSITY
JULY, 1932

BULLETIN OF THE UNIVERSITY OF WISCONSIN
Serial 1846, General Series No. 1630

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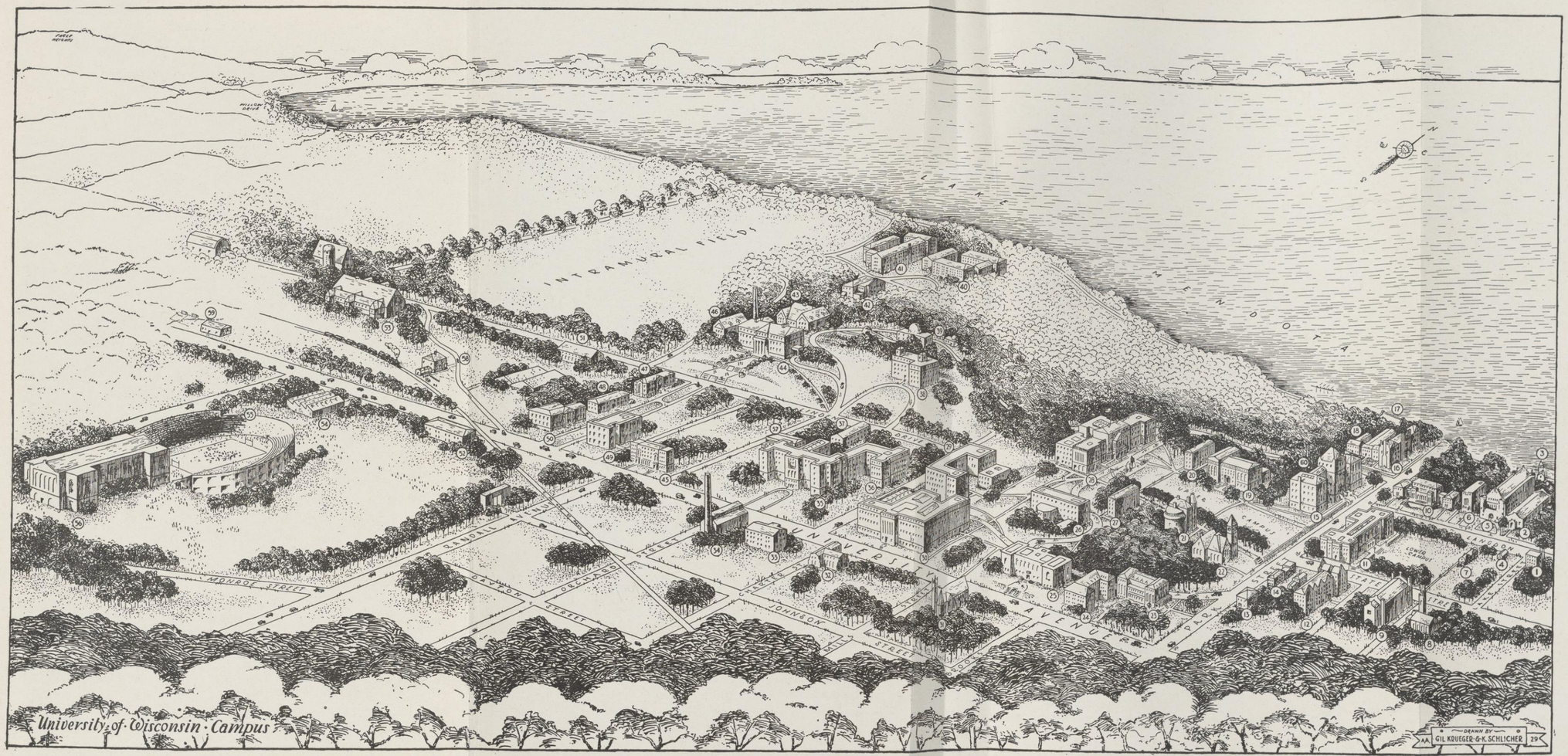

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2. Gymnasium Annex
3. Boathouse
4. Athletic Ticket Office
5. Gymnasium and Armory
6. Y. M. C. A. Building
7. Applied Arts Laboratory
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9. St. Paul's Catholic Chapel
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51. Horticultural Building
43. Soils Building
53. Stock Pavilion
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2. Gymnasium Annex
34. Heating Station
25. Lathrop Hall
21. Law Building
11. Library
10. Memorial Union
39. Observatory
33. Service Building
55. Stadium
49. Wisconsin High School

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12. University Club (faculty)
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1933

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CALENDAR

ACADEMIC YEAR 1931-32

FIRST SEMESTER

Sept. 11, 12	Friday, Saturday	Examinations for admission
Sept. 16-22	Wednesday-Tuesday	Freshman Period (attendance required)
Sept. 18-22	Friday-Tuesday (noon)	Registration days for other new students
Sept. 19-22	Saturday-Tuesday noon	Registration days for old students
Sept. 23	Wednesday	Instruction begins
Sept. 26	Saturday	Special examinations for removal of conditions
Nov. 11	Wednesday	Armistice Day; legal holiday
Nov. 26	Thursday	Thanksgiving Day; legal holiday (one day only)
Dec. 18	Friday (noon)	Christmas recess commences
Jan. 5	Tuesday (8 a.m.)	Instruction resumed
Jan. 16	Saturday	Examinations for removal of conditions
Jan. 25-Feb. 3	Monday-Wednesday	Final examinations

SECOND SEMESTER

Feb. 1, 2	Thursday	Examinations for admission
Feb. 4	Monday, Tuesday	Registration day for new and reentered students
Feb. 8	Monday	Instruction begins
Feb. 22	Monday	Washington's Birthday; legal holiday
April 5	Tuesday, (after last class)	Spring recess commences
April 13	Wednesday (8 a.m.)	Instruction resumed
April 16	Saturday	Examinations for removal of conditions
May 30	Monday	Memorial Day; legal holiday
June 6-14	Monday-Tuesday	Final examinations
June 13,14	Monday-Tuesday	Examinations for admission
June 18	Saturday	Alumni day
June 19	Sunday	Baccalaureate day
June 20	Monday	Commencement day

SUMMER SESSION 1932

June 20	Monday	Law School opens
June 27	Monday	Registration day, University at large
June 28	Tuesday	Instruction begins, University at large
July 4	Monday	Independence Day; legal holiday
August 5	Friday	Six-week session closes
August 26	Friday	Nine-week session and Law School close

CALENDAR

ACADEMIC YEAR 1932-33

FIRST SEMESTER

Sept. 9, 10	Friday, Saturday	Examinations for admission
Sept. 14-20	Wednesday-Tuesday	Freshman Period (attendance required)
Sept. 16-20	Friday-Tuesday (noon)	Registration days for other new students
Sept. 17-20	Saturday-Tuesday (noon)	Registration days for old students
Sept. 21	Wednesday	Instruction begins
Sept. 24	Saturday	Special condition examinations; foreign language attainment examinations
Nov. 11	Friday	Armistice Day: legal holiday
Nov. 24	Thursday	Thanksgiving Day: legal holiday (one day only)
Dec. 21	Wednesday (noon)	Christmas recess commences
Jan. 5	Thursday (8 a. m.)	Instruction resumed
Jan. 14	Saturday	Foreign language attainment examinations Examinations for removal of conditions
Jan. 23-Feb. 1	Monday-Wednesday	Final examinations

SECOND SEMESTER

Jan. 30, 31	Monday, Tuesday	Examinations for admission
Feb. 2	Thursday	Registration day for new and re-entered students
Feb. 6	Monday	Instruction begins
Feb. 22	Wednesday	Washington's birthday: legal holiday
Apr. 4	Tuesday (after last class)	Spring recess commences
Apr. 12	Wednesday (8 a. m.)	Instruction resumed
Apr. 15	Saturday	Examinations for removal of conditions
May 13	Saturday	Foreign language attainment examinations
May 30	Tuesday	Memorial Day: legal holiday
June 5-13	Monday-Tuesday	Final examinations
June 12, 13	Monday, Tuesday	Examinations for admission
June 17	Saturday	Alumni day
June 18	Sunday	Baccalaureate day
June 19	Monday	Commencement day

SUMMER SESSION 1933

June 19	Monday	Law School opens
June 26	Monday	Registration day, University at large
June 27	Tuesday	Instruction begins, University at large
July 4	Tuesday	Independence Day: legal holiday
August 4	Friday	Six-week session closes
August 25	Friday	Nine-week session and Law School close

THE REGENTS OF THE UNIVERSITY

	Term expires
State-at-Large—Carl Drexler, Menasha	1936
State-at-Large—Gunnar Gundersen, La Crosse	1937
State-at-large—Daniel H. Grady, Portage	1938
State-at-Large—Arthur Sholts, Oregon	1935
First District—	1937
Second District—Fred H. Clausen, Horicon	1936
Second District—Harold M. Wilkie, Madison	1937
Third District—Mrs. Clara T. Runge, Baraboo	1938
Fourth District—Mrs. Meta Berger, Milwaukee	1934
Fifth District—Judge A. C. Backus, Milwaukee	1933
Sixth District—Miss Elizabeth A. Waters, Fond du Lac	1933
Seventh District—George W. Mead, Wisconsin Rapids	1934
Eighth District—Herman W. Ullsperger, Sturgeon Bay	1936
Ninth District—Ben F. Faast, Eau Claire	1932
Tenth District—Peter Eimon, Superior	1935

Glenn Frank, President of the University, *ex-officio.*
John Callahan, State Superintendent of Public Instruction, *ex-officio.*

OFFICERS OF THE REGENTS

Ben F. Faast, President
Miss Elizabeth A. Waters, Vice-President
Solomon Levitan, State Treasurer, *ex-officio* Treasurer
James D. Phillips, Business Manager
Maurice E. McCaffrey, Secretary

THE BOARD OF VISITORS

Appointed by the Regents

Loyal Durand, Milwaukee	1932
H. W. Kircher, Sheboygan	1933
Mrs. Charles R. Carpenter, Madison	1934
George P. Hambrecht, Madison	1935

Appointed by the Alumni

B. E. McCormick, Madison	1932
Mrs. Lucy M. Johnson, Madison	1933
B. A. Kiekhofer, Milwaukee	1934
Judge Evan A. Evans, Chicago	1935

Appointed by the Governor

Mrs. Allan Classon, Oconto	1932
Carl J. Hesgard, Orfordville	1933
W. W. Kelly, Green Bay	1934
Mrs. Allan J. Roberts, Milwaukee	1935

ADMINISTRATIVE OFFICERS

GENERAL

PRESIDENT

GLENN FRANK, *President*
JULIA M. WILKINSON, *Executive Secretary to the President*

DEAN OF MEN

SCOTT H. GOODNIGHT

DEAN OF WOMEN

MRS. LOUISE F. TROXELL, *Dean*
SUSAN B. DAVIS, *Assistant to the Dean*
MRS. CLARA B. FLETT, *Assistant to the Dean*
ZOE B. BAYLISS, *Assistant to the Dean*

SECRETARY OF THE FACULTY

CHARLES A. SMITH, *Secretary of the Faculty*
ALDEN W. WHITE, *Assistant Secretary of the Faculty*

REGISTRAR

FRANK O. HOLT, *Registrar,*
GEORGIA M. MARTIN, *Assistant Registrar*

BUREAU OF GUIDANCE AND RECORDS

FRANK O. HOLT, *Executive Director*
V. A. C. HENMON, *Director of Educational Guidance*
ALANSON H. EDGERTON, *Director of Vocational Guidance*

UNIVERSITY LIBRARY

WALTER M. SMITH, *University Librarian*
CLARENCE S. HEAN, *Librarian, Agricultural Library*
FREDERICK E. VOLK, *Librarian, Engineering Library*
MRS. SOPHIE M. BRIGGS, *Librarian, Law Library*
FRANCIS B. VAN ZANDT, *Librarian, Medical Library*

DEPARTMENT OF MILITARY SCIENCE

GUSTAV J. GONSER, Major of Infantry, U. S. A., *Commandant*

DEPARTMENT OF STUDENT HEALTH

WILLIAM A. MOWRY, *Physician in Chief*
SARAH I. MORRIS, *Associate Physician*

PHYSICAL EDUCATION

ARPAD L. MASLEY, *Director of the Men's Gymnasium*
BLANCHE M. TRILLING, *Director of the Women's Gymnasium*

LOANS AND SCHOLARSHIPS

JULIUS E. OLSON, *Chairman*

DORMITORIES AND COMMONS

DONALD L. HALVERSON, *Director*

WISCONSIN UNION

PORTER BUTTS, *House Director*

EDUCATIONAL

COLLEGE OF LETTERS AND SCIENCE
George C. Sellery, *Dean*
Harry Glicksman, *Junior Dean*
Course in Chemistry—J. Howard Mathews, *Director*
Course in Humanities—Carl Russell Fish, *Chairman*
Course in Pharmacy—Edward Kremers, *Director*

SCHOOL OF COMMERCE—Chester Lloyd Jones, *Director*

SCHOOL OF JOURNALISM—Willard G. Bleyer, *Director*

LIBRARY SCHOOL
Clarence B. Lester, *Director*
Mary Emogene Hazeltine, *Principal*

SCHOOL OF MUSIC—Charles H. Mills, *Director*

COLLEGE OF ENGINEERING
Frederick E. Turneaure, *Dean*
Adam U. Millar, *Assistant Dean*
Course in Chemical Engineering—Otto L. Kowalke, *Chairman*
Course in Civil Engineering—Leslie F. Van Hagan, *Chairman*
Course in Electrical Engineering—Edward Bennett, *Chairman*
Course in Mechanical Engineering—Gustus L. Larson, *Chairman*
Course in Mining and Metallurgy—R. S. McCaffery, *Chairman*

COLLEGE OF AGRICULTURE
Chris L. Christensen, *Dean*
Ira L. Baldwin, *Assistant Dean*
Course in Home Economics—Abby L. Marlatt, *Director*

LAW SCHOOL—Lloyd K. Garrison, *Dean*

MEDICAL SCHOOL
Charles R. Bardeen, *Dean*
Walter J. Meek, *Assistant Dean*

SCHOOL OF NURSING—Helen I. Denne, *Director*

SCHOOL OF EDUCATION—C. J. Anderson, *Dean*
Course in Art Education—William H. Varnum, *Chairman*
Course in Physical Education and Athletic Coaching for Men
Guy S. Lowman, *Chairman*
Course in Physical Education for Women
Blanche M. Trilling, *Chairman*
University High School—Heber H. Ryan, *Principal*

GRADUATE SCHOOL—Charles S. Slichter, *Dean*

EXTENSION DIVISION—Chester D. Snell, *Dean*

SUMMER SESSION—Scott H. Goodnight, *Dean*

BUSINESS

BUSINESS OFFICES

JAMES D. PHILLIPS, *Business Manager*
MAURICE E. MCCAFFREY, *Secretary of the Regents*
HERBERT A. BORK, *Comptroller*
ALFRED W. PETERSON, *Assistant to the Business Manager*
CLARENCE W. VAUGHN, *Accountant*
DONALD L. HALVERSON, *Director of Dormitories and Commons*
WILLIAM H. NEGLEY, *University Editor*

PHYSICAL PLANT

ALBERT F. GALLISTEL, *Superintendent of Buildings and Grounds*
GUSTUS L. LARSON, *Consulting Mechanical Engineer*
WILLIAM S. KINNE, *Consulting Structural Engineer*
JOHN J. NOVOTNY, *Power Plant Engineer*
FRED R. CUTCHEON, *Electrical Engineer*

STANDING COMMITTEES OF THE UNIVERSITY FACULTY

1931-32

The President is, ex-officio, a member of all standing committees, and the Secretary of the Faculty of each administrative committee.

ADMINISTRATIVE—The President, deans, and secretary of the faculty.

APPEALS—Professor Kommers, chairman; the deans and advisers of students concerned; Professors Feinsinger, Gillin, Otto, W. Taylor, and Watson.

ATHLETIC BOARD—Professor A. T. Weaver, Chairman; Dean Goodnight, Professors Hobson and Larson; Walter Alexander and J. P. Riordan, alumni members; Harold Smedal, student member; Regent Clausen and Professor Phillips, Business Manager, advisory members. (Replaced the Athletic Council, a sub-committee of the Committee on Student Life and Interests, May 1, 1932.)

CARDINAL ADVISORY—Professor Hyde, chairman; Professors Fellows and P. G. Fox.

CATALOG—Professor C. A. Smith, chairman; Assistant Deans James and Millar; Registrar Holt.

DISCIPLINE—Professor A. T. Weaver, chairman; the deans in cases relating to students in their respective colleges; Professors Adkins, P. G. Fox, Ingersoll, Meek; the student's adviser, ex-officio and without vote.

EDITORS OF UNIVERSITY OF WISCONSIN STUDIES—Professor K. Young, chairman; Professor Quintana, editor for Language and Literature; Professor W. Weaver, editor for Science; Professor Potter, editor for Social Sciences and History; the University Editor, Secretary.

FRESHMAN PERIOD—Registrar Holt, chairman; Dean Troxell; Junior Dean Glicksman; Assistant Deans James, Meek, Millar; Professors Edgerton, Henmon.

FRESHMAN—Junior Dean Glicksman, chairman; Assistant Deans James and Millar; Professor Lowman.

GRADUATE SCHOOL—Dean of the Graduate School, chairman; Professors Anderson, Commons, Duggar, Hohlfeld, and Paxson.

HIGH SCHOOL RELATIONS—Dean Anderson, chairman; Professors Chase, Cheydleur, Edgerton, Elwell, Gilbert, Henmon, James, Millar, Ryan, C. A. Smith, and Willing; Registrar Holt.

HONORARY DEGREES—Professor Paxson, chairman; the deans; Professors Dickson, J. S. Evans, C. K. Leith.

LECTURES AND CONVOCATIONS—Professor Gaus, chairman; Dean of the College of Letters and Science; Dean Slichter; Professors Buck, Fulcher, Ingersoll, Otto, and Perlman.

LIBRARY—The President and the University Librarian; (elected) Professors Henmon, Meek, Morgan, Page, Roe, and Watson.

LOANS AND UNDERGRADUATE SCHOLARSHIPS—Professor Olson, chairman; Professors Gillen, Goodnight, James, Millar, Helen White, and Mrs. Flett.

NOMINATIONS—(elected) Professors R. A. Brown, P. F. Clark, Bohstedt.

PUBLIC FUNCTIONS—Professor Ewbank, chairman; Professors Gordon, Krauskopf, G. L. Larson, Sumner, and Withey; Mr. Gallistel, Mr. Bergstresser, Mr. Chandler, Secretary.

REGENT-FACULTY CONFERENCE—The President of the University, ex-officio; Regents: Backus, Berger, Clusen, Callahan, Sholts, and Waters.

FACULTY: (elected) Rryan, Knaplund, Krauskopf, Meek, Roe, Rundell, Sellery, M. P. Sharp, Skinner, Wagner, Whitbeck, White, C. Wood, Withey (chairman of the University Committee, ex-officio).

RELATIONS WITH TEACHERS' COLLEGES OF STATE—Dean Anderson, chairman; Deans Sellery and Slichter; Professors Kivlin and C. A. Smith; Registrar Holt.

RESEARCH—Dean Slichter, chairman; Professors Fred, Glaeser, Hisaw, Knaplund, and Sevringhaus.

ROOMS AND TIME-TABLE—Professor C. A. Smith, chairman; Professors R. H. Denniston, H. L. Hall, James, Kiekhofer, Kowalke, Krauskopf, March, Meek, Mills, Roebuck, Shock, and Watson.

STUDENT CONDUCT—Professor Daniels, chairman; Professors Borchers, Denne, Roark, Stovall; the deans of the University.

STUDENT LIFE AND INTERESTS—Dean Goodnight, chairman; Dean Troxell, associate chairman.

Athletics: Professor Pyre, chairman; Professor Little, Secretary; Professor Phillips, business manager; Professors J. G. Moore, Kowalke, and E. R. Schmidt; Professor Trilling in cases relating to women; Walter Alexander, H. C. Marks, and J. P. Riordan, alumni members; Harold Smedal, student member. (Replaced by Athletic Board, May 1, 1932.)

Intramural and Recreational Athletics: Professor Pyre, chairman; Professors L. B. Johnson and G. L. Larson, faculty members; James Plankey and Laura Bickel, student members.

Living Conditions and Hygiene: Professor Hastings, chairman; Professors P. F. Clark, Mowry, Stovall, Miss Caldwell, and house inspectors.

Musical Organizations: Professor Mills, chairman; Professors Iltis and Gordon.

Oratory and Dramatics: Professor A. T. Weaver, chairman; Professors Cool and Troutman.

Publications: Professor Bleyer, chairman; Professors Aurner and Hyde.

Society, Fraternities, and Politics: Professor C. E. Allen, chairman; Professors Fellows, Noland; and Miss Bayliss.

UNIVERSITY—(Elected) Professor Withey, chairman; Professors P. F. Clark, Hopkins, Paxson, Rundell, and Twenhofel.

INSTRUCTIONAL AND ADMINISTRATIVE STAFFS

1931-32

I indicates first semester; II, second semester.

UNIVERSITY FACULTY

FRANK, GLENN, *M.A., Litt.D., L.H.D., LL.D.*, President of the University
BIRGE, EDWARD ASAHEL, *Ph.D., Sc.D., LL.D.*, President Emeritus

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ADKINS, HOMER BURTON, *Ph.D.*, Professor of Chemistry
AGARD, WALTER RAYMOND, *B.Litt.*, Professor of Greek (on leave II)
ALBERT, ARTHUR ROBERT, *M.S.*, Assistant Professor of Soils; in charge of Hancock and Coddington Branch Experiment Stations
ALEXANDER, ALEXANDER SEPTIMUS, *F.H.A.S., M.D.C.*, Professor of Veterinary Science
ALLEN, CHARLES ELMER, *Ph.D.*, Professor of Botany
ALLEN, CHESTER, Director of Field Organization, Extension Division
ALLEN, KATHARINE, *Ph.D.*, Assistant Professor of Latin, Emeritus
ALTMEYER, ARTHUR JOSEPH, *Ph.D.*, Lecturer in Economics
AMUNDSON, ROBERT ANDREW, *B.S.*, Assistant Professor of Agricultural Extension; Assistant State Leader of County Agricultural Representatives
ANDERSON, C. J., *Ph.M.*, Dean of the School of Education, Professor of Education
ANDERSON, DON SHERMAN, *B.S.*, Assistant Professor of Agricultural Economics (commencing March 29, 1932)
APPELT, EWALD PAUL, *Ph.D.*, Assistant Professor of German
AURNER, ROBERT RAY, *Ph.D.*, Professor of Business Administration
AUST, FRANZ AUGUST, *M.S., M.L.D.*, Associate Professor of Horticulture
AUSTIN, RUSSELL HAYDEN, *Ph.D.*, Assistant Professor of Soils
AVEY, HARRY THOMPSON, *M.E.*, Assistant Professor of Mechanical Engineering, Milwaukee Extension Center
AYRES, EDMUND DALE, *B.A., M.S.*, Assistant Professor of Electrical Engineering

BABCOCK, STEPHEN MOULTON, *Ph.D., LL.D., Sc.D.*, Professor of Agricultural Chemistry, Emeritus (deceased July 1, 1931)
BAIRD, PARKER KARNS, *M.A.*, Lecturer in Forest Products
BAKKEN, HENRY HARRISON, *M.A.*, Assistant Professor of Agricultural Economics
BALDWIN, IRA LAWRENCE, *Ph.D.*, Associate Professor of Agricultural Bacteriology
BALDWIN, LEO STARR, *B.S.*, Assistant Professor of Drawing, Milwaukee Extension Center
BARDEEN, CHARLES RUSSELL, *B.A., M.D.*, Dean of the Medical School, Professor of Anatomy
BARKER, GEORGE JOHN, *E.M.*, Assistant Professor of Mining and Metallurgy

BARR, ARVIL SYLVESTER, *Ph.D.*, Professor of Education
BASCOM, LELIA, *M.A.*, Associate Professor of English, Extension Division
BASSETT, GLADYS BARTON, *M.A.*, Associate Professor of Physical Education (on leave I)
BAST, THEODORE HIERONYMUS, *Ph.D.*, Associate Professor of Anatomy
BATEMAN, ERNEST, *Ph.B.*, Lecturer in Forest Products
BEACH, BURR ABRAHAM, *D.V.M.*, Associate Professor of Veterinary Science
BEATTY, ARTHUR, *Ph.D.*, Professor of English
BENNETT, EDWARD, *E.E.*, Professor of Electrical Engineering
BENNETT, HAROLD, *Ph.D.*, Professor of Classics
BENNETT, THEODORE, *Ph.D.*, Assistant Professor of Mathematics
BERKOWITZ, HYMAN CHONON, *Ph.D.*, Associate Professor of Spanish
BEWICK, THOMAS LYMAN, *M.S.*, State Leader of Boys' and Girls' Agricultural Clubs
BLANKINSHIP, RAY CARRINGTON, *M.D.*, Associate Professor of Clinical Medicine
BLECKWENN, WILLIAM JEFFERSON, *B.S.*, *M.D.*, Associate Professor of Neuropsychiatry
BLEYER, WILLARD GROSVENOR, *Ph.D.*, Director of the School of Journalism, Professor of Journalism
BOESEL, FRANK TILDEN, *Ph.B.*, *LL.B.*, Lecturer in Law
BÖGHOLT, CARL MÖLLER, *B.S.*, Assistant Professor of Philosophy, Adviser in Experimental College
BOHSTEDT, GUSTAV, *Ph.D.*, Professor of Animal Husbandry
BORCHERS, GLADYS LOUISE, *Ph.D.*, Assistant Professor of Speech
BOUGHTON, DONALD CLARKE, *M.S.*, Assistant Professor of Zoology, Milwaukee Extension Center.
BRADLEY, HAROLD CORNELIUS, *Ph.D.*, Professor of Physiological Chemistry
BRADLEY, ROBERT FOSTER, JR., *M.A.*, Assistant Professor of French
BRANN, JOHN WILLIAM, *M.S.*, Assistant Professor of Horticulture and Plant Pathology
BRAY, MARK WILDER, *M.S.*, Lecturer in Forest Products
BRIGGS, GEORGE MCSPADDEN, *B.S.*, Assistant State Leader of County Agricultural Representatives, Associate Professor of Agronomy
BRINK, ROYAL ALEXANDER, *Sc.D.*, Professor of Genetics
BROWN, GEORGE VAN INGEN, *D.D.S.*, *M.D.*, *F.A.C.S.*, Professor of Oral and Plastic Surgery
BROWN, RAY ANDREWS, *B.A.*, *LL.B.*, *S.J.D.*, Professor of Law
BROWNE, FREDERICK LINCOLN, *Ph.D.*, Lecturer in Forest Products
BRUNS, FRIEDRICH, *Ph.D.*, Professor of German (on leave 1931-32)
BRYAN, GEORGE SMITH, *Ph.D.*, Professor of Botany
BUCK, PHILO MELVIN, JR., *M.A.*, Professor of Comparative Literature
BUERKI, ROBIN CARL, *B.S.*, *M.D.*, Superintendent of Wisconsin General Hospital
BUNTING, CHARLES HENRY, *B.S.*, *M.D.*, Professor of Pathology
BURKE, LAURENCE CHARLES, *B.L.*, Assistant Librarian
BURLEIGH, CECIL EDWARD, Professor of Music
BURNETT, DONALD CHARLES, *LL.B.*, Captain of Infantry, U. S. A., Assistant Professor of Military Science (deceased July 14, 1931)
BURNS, ROBERT EMMETT, *B.S.*, *M.D.*, Associate Professor of Orthopedic Surgery
BUSH, CHILTON ROWLETTE, *M.A.*, Associate Professor of Journalism

CAIRNS, WILLIAM B., *Ph.D.*, Associate Professor of American Literature
CALDERWOOD, HOWARD NEWTON, JR., *Ph.D.*, Assistant Professor of Chemistry
CAMPBELL, RALPH EMERSON, *B.S.*, *M.D.*, Associate Professor of Obstetrics and Gynecology

CAMPBELL, RICHARD VALENTINE, *B.A., LL.B., J.S.D.*, Assistant Professor of Law
CAMPBELL, RUTH, *M.A.*, Hostess of Chadbourne Hall
CARPENTER, MRS. LOUISE LOCKWOOD, *B.M.*, Associate Professor of Music
CASE, CLINTON DEWAYNE, *B.S.*, Assistant Professor of Mechanical Engineering, Extension Division
CASON, HULSEY, *Ph.D.*, Professor of Psychology
CHAPMAN, CLINTON JOSEPH, *B.S.*, Professor of Soils
CHASE, SAMUEL HAMILTON, *D.D.S., F.A.C.D.*, Lecturer in Dental Surgery
CHASE, WAYLAND JOHNSON, *M.A.*, Professor of Education
CHEYDLEUR, FREDERIC DANIEL, *Ph.D.*, Professor of French
CHRISTENSEN, CHRISTIAN LAURITHS, *B.S.*, Dean of the College of Agriculture, Director of the Agricultural Experiment Station and of Agricultural Extension
CLAPP, FRANK LESLIE, *Ph.D.*, Professor of Education
CLARK, HARRY HAYDEN, *M.A.*, Assistant Professor of English (on leave 1931-32)
CLARK, NOBLE, *M.S.*, Assistant Director of the Agricultural Experiment Station
CLARK, PAUL FRANKLIN, *Ph.D.*, Professor of Medical Bacteriology
CLARK, WARREN WILLIAM, *B.S.*, Assistant State Leader of County Agricultural Representatives
CLARKE, HELEN ISABEL, *M.A.*, Assistant Professor of Sociology
CODDINGTON, HESTER, Assistant Librarian, Emeritus
COLBERT, ROY JEFFERSON, *Ph.D.*, Chief of the Bureau of Economics and Sociology and Associate Professor of Economics, Extension Division
COLE, LEON JACOB, *Ph.D.*, Professor of Genetics
COMMONS, JOHN ROGERS, *M.A., LL.D.*, Professor of Economics
COMSTOCK, GEORGE CARY, *Sc.D., LL.D.*, Professor of Astronomy, Emeritus
COOL, CHARLES DEAN, *Ph.D.*, Associate Professor of Spanish
COON, LELAND AVERY, *B.A.*, Associate Professor of Music
COWLES, MAY LOUISE, *Ph.D.*, Assistant Professor of Home Economics
CRANE, FRANK DOUGALL, *Ph.D.*, Assistant Professor of English, Extension Division
CREAMER, JOHN JOSEPH, *B.A., LL.B.*, Assistant Professor of English, Milwaukee Extension Center
CRONIN, KATHERINE LUCILE, *M.A.*, Associate Professor of Physical Education
CURRAN, CARLETON EDGAR, *Ph.D.*, Lecturer in Forest Products

DALLEY, ORIEN EMEAL, *B.M.*, Assistant Professor of Music
DALTON, WILLIAM FRANCIS, Captain of Infantry, U. S. A., Assistant Professor of Military Science
DANIELS, FARRINGTON, *Ph.D.*, Professor of Chemistry
DAVIS, FREDERICK ALLISON, *M.D.*, Professor of Ophthalmology
DAVIS, IRA CLEVELAND, *M.A.*, Assistant Professor in the Teaching of Science
DAVIS, JOHN JEFFERSON, *B.S., M.D.*, Curator of the Herbarium
DAVIS, MRS. WINIFRED LEMON, *M.A.*, Assistant Professor of Library Science
DAWSON, FRANCIS MURRAY, *M.C.E.*, Professor of Hydraulic Engineering
DAWSON, PERCY MILLARD, *B.A., M.D.*, Associate Professor of Physiology (on leave 1931-32)
DEAN, CHARLES LYMAN, *B.S.*, Assistant Professor of Mechanical Engineering, Extension Division
DE LANCEY, DE VAUX, *M.A.*, Lecturer in French
DELWICHE, EDMOND JOSEPH, *M.S.*, Professor of Agronomy, in charge of Ashland, Spooner, and Peninsular Branch Experiment Stations
DENNE, HELEN IRENE, *B.A., R.N.*, Director of the School of Nursing, Professor of Nursing
DENNISTON, MRS. HELEN DOBSON, *M.D.*, Associate Professor of Physical Education

DENNISTON, ROLLIN HENRY, *Ph.D.*, Assistant Professor of Botany
DICKSON, JAMES GEERE, *Ph.D.*, Professor of Plant Pathology
DODGE, BERNICE FRANCES, *M.S.*, Associate Professor of Home Economics (on leave 1931-32)
DODGE, ROBERT ELKIN NEIL, *M.A.*, Professor of English
DOERING, HELMUTH REINHOLD, *B.A., M.B.A.*, Assistant Professor of Business Administration, Extension Division
DONALD, JOHN SWEET, *B.S., D.D.S.*, Assistant Professor of Agricultural Economics
DORRANS, JAMES MORGAN, Superintendent of Engineering Shop Laboratories, Assistant Professor of Mechanical Practice
DOWNER, GEORGE FORD, *B.L.*, Associate Professor of Physical Education, Director of Athletic Publicity
DRAKE, LEWIS ETHELBERT, *Ph.D.*, Assistant Professor of Psychology, Milwaukee Extension Center
DUDLEY, WILLIAM HENRY, *B.A.*, Assistant Librarian
DUFFEE, FLOYD WALDO, *B.S.*, Professor of Agricultural Engineering
DUGGAR, BENJAMIN MINGE, *Ph.D.*, Professor of Physiological and Applied Botany
DURAND, LOYAL, JR., *Ph.D.*, Assistant Professor of Geography

EASTMAN, IRENE BELLE, *B.M.*, Assistant Professor of Music
EASUM, CHESTER VERNE, *Ph.D.*, Assistant Professor of History
EDGERTON, ALANSON HARRISON, *Ph.D.*, Professor of Guidance, Director of Vocational Guidance
EDSALL, BESSIE EVA, *Ph.M.*, Assistant Professor of History, Extension Division
ELLINGWOOD, RICHARD EVERETT, *M.S.*, Associate Professor of Business Administration, Extension Division
ELLIOTT, BENJAMIN GEORGE, *M.S.*, Professor of Mechanical Engineering, Extension Division and College of Engineering
ELSOM, JAMES CLAUDE, *M.D.*, Professor of Physical Education, Associate Professor of Physical Therapy
ELVEHJEM, CONRAD ARNOLD, *Ph.D.*, Assistant Professor of Agricultural Chemistry
ELWELL, FAYETTE HERBERT, *B.A., C.P.A.*, Professor of Accounting
EMMONS, RICHARD CONRAD, *Ph.D.*, Associate Professor of Geology
ENGLISH, HENRY ROWLAND, *M.A.*, Chief of the Bureau of Business Information and Professor of Business Administration, Extension Division
ERNST, ADOLPHINE BIANCA, *Ph.D.*, Associate Professor of German, Extension Division and College of Letters and Science
EVANS, HERBERT PULSE, *Ph.D.*, Assistant Professor of Mathematics
EVANS, JOSEPH SPRAGG, *B.A., M.D.*, Professor of Medicine
EWBANK, HENRY LEE, *Ph.D.*, Associate Professor of Speech
EYSTER, JOHN AUGUSTINE ENGLISH, *B.S., M.D.*, Professor of Physiology

FARGO, JOHN MERRILL, *M.S.*, Assistant Professor of Animal Husbandry
FARRINGTON, EDWARD HOLYOKE, *M.S.*, Professor of Dairy Husbandry, Emeritus
FASSETT, NORMAN CARTER, *Ph.D.*, Assistant Professor of Botany
FAY, IVAN GLENN, *B.S.*, Assistant Professor of Agricultural Education
FEINSINGER, NATHAN PAUL, *B.A., J.D.*, Assistant Professor of Law
FELLOWS, DONALD ROSS, *M.A.*, Associate Professor of Business Administration
FINCH, VERNOR CLIFFORD, *Ph.D.*, Professor of Geography (on leave I)
FINGARSON, GEORGE EDWIN, *B.A.*, Captain of Infantry, U. S. A., Assistant Professor of Military Science
FISCHER, RICHARD, *Ph.D.*, Professor of Chemistry
FISH, CARL RUSSELL, *Ph.D.*, Professor of History

FISK, EMMA LUELLA, *Ph.D.*, Assistant Professor of Botany
FLETCHER, LILA BELLE, *R.N.*, Associate Professor of Nursing
FLUKE, CHARLES LEWIS, JR., *Ph.D.*, Associate Professor of Economic Entomology
FOERSTER, HARRY ROBERT, *B.S., M.D.*, Assistant Professor of Dermatology
FOERSTER, OTTO HOTTINGER, *M.D.*, Professor of Dermatology
FOWLER, RUSSELL WINSLOW, *M.S.*, Assistant Professor of Drawing, Extension Division
FOWLKES, JOHN GUY, *Ph.D.*, Professor of Education
FOX, PHILIP GORDER, *M.A.*, Associate Professor of Business Administration
FOX, TOM W., Major of Infantry, U. S. A., Commandant and Professor of Military Science
FRED, EDWIN BROUN, *Ph.D.*, Professor of Agricultural Bacteriology
FRIESE, JOHN FRANK, *M.S.*, Assistant Professor of Industrial Education—I
FROKER, RUDOLPH KNUGAARD, *M.S.*, Associate Professor of Agricultural Economics
FROST, WILLIAM DODGE, *Ph.D., Dr.P.H.*, Professor of Agricultural Bacteriology
FULCHER, PAUL MILTON, *Ph.D.*, Associate Professor of English
FULLER, JAMES GARFIELD, *M.S.*, Professor of Animal Husbandry
FULLER, WILLIAM JOHN, *B.A.*, Associate Professor of Civil and Structural Engineering, Milwaukee Extension Center

GAENSLEN, FREDERICK JULIUS, *B.S., M.D.*, Professor of Orthopedic Surgery
GALE, JOSEPH WASSON, *M.A., M.D.*, Associate Professor of General Surgery
GANGSTAD, IDA MARIE, *B.A.*, Assistant Professor of Library Methods, Extension Division
GAUS, JOHN MERRIMAN, *Ph.D.*, Professor of Political Science
GAUSEWITZ, ALFRED LEROY, *B.A., LL.B.*, Assistant Professor of Law
GAY, LUCY MARIA, *B.L.*, Associate Professor of French (on leave 1931-32)
GEIST, FREDERICK DENKMAR, *M.D.*, Assistant Professor of Anatomy
GERRY, ELOISE, *Ph.D.*, Lecturer in Forest Products
GIBSON, JOHN CURRIE, *B.A., C.P.A.*, Associate Professor of Accounting
GIESE, WILLIAM FREDERICK, *M.A.*, Professor of French, Emeritus
GIESSEL, MRS. HELEN BROWN, *B.S.*, Assistant Professor of Dietetics, School of Nursing
GILBERT EDWARD MARTINIUS, *Ph.D.*, Professor of Botany and Plant Pathology
GILLEN, CHARLES FREDERICK, *Ph.D.*, Associate Professor of French
GILLIN, JOHN LEWIS, *Ph.D., LL.D.*, Professor of Sociology
GLAESER, MARTIN GUSTAVE, *Ph.D.*, Professor of Economics
GLASSOW, RUTH BERTHA, *M.A.*, Associate Professor of Physical Education
GLICKSMAN, HARRY, *LL.B., Ph.D.*, Junior Dean of the College of Letters and Science, Lecturer in English
GONCE, JOHN EUGENE, JR., *B.A., M.D.*, Associate Professor of Pediatrics
GOODNIGHT, SCOTT HOLLAND, *Ph.D., LL.D.*, Dean of Men, Dean of the Summer Session
GORDON, EDGAR BERNARD, Professor of Music
GOWER, CHARLOTTE DAY, *Ph.D.*, Assistant Professor of Physical Anthropology
GRABER, LAURENCE FREDERICK, *Ph.D.*, Professor of Agronomy
GRAFF, MARSHALL CONANT, *M.A.*, Assistant Professor and District Representative, Appleton District, Extension Division
GRAUL, EDWARD JOHN, *M.S.*, Associate Professor of Soils
GREELEY, HUGH PAYNE, *B.A., M.D.*, Lecturer in Education—II
GREEN, MORTON KAY, *M.D.*, Clinical Associate in Neuropsychiatry
GREENLEAF, MRS. JEANNE HAROUEL, *B.L.*, Assistant Professor of French (deceased January 22, 1932)
GRIEBSCH, MAX, *Ph.D.*, Professor of German

GROVER, ARLENE EDNA, *B.L.*, Assistant Librarian
GROVES, HAROLD MARTIN, *Ph.D.*, Associate Professor of Economics
GUYER, MICHAEL FREDERIC, *Ph.D., LL.D.*, Professor of Zoology
GUYLES, CALLA ARATHUSA, *Ph.B.*, Assistant Professor in the Teaching of Latin

HAAS, ALFRED JOHN, Executive Secretary, College of Agriculture
HADLEY, FREDERICK BROWN, *D.V.M.*, Professor of Veterinary Science
HAENTZSCHEL, ADOLPH THEODORE, *Ph.D.*, Lecturer in Philosophy
HAGEN, OSKAR FRANK LEONARD, *Ph.D.*, Professor of the History and Criticism of Art (on leave I)
HALE, WEALTHY MARIA, *B.S.*, Assistant Professor of Home Economics
HALL, HOWARD LEWIS, *B.A., LL.B.*, Assistant Professor of Law
HALL, ISAAC FULTS, *Ph.D.*, Assistant Professor of Agricultural Economics
HALL, NORRIS FOLGER, *Ph.D.*, Associate Professor of Chemistry
HALPIN, JAMES GARFIELD, *B.S.*, Professor of Poultry Husbandry
HANLEY, MILES LAWRENCE, *M.A.*, Associate Professor of English (on leave 1932-32)
HARLOW, HARRY FREDERICK, *Ph.D.*, Assistant Professor of Psychology
HARPER, CARL SAMUEL, *B.S., M.D.*, Assistant Clinical Professor of Obstetrics and Gynecology
HARRIS, JOHN WARTON, *M.A., M.D.*, Professor of Obstetrics and Gynecology
HARRIS, JULIAN EARLE, *Ph.D.*, Assistant Professor of French
HART, EDWIN BRET, *B.S.*, Professor of Agricultural Chemistry
HART, WALTER WILSON, *B.A.*, Associate Professor in the Teaching of Mathematics (on leave II)
HASTINGS, EDWIN GEORGE, *M.S.*, Professor of Agricultural Bacteriology
HATCH, KIRK LESTER, *B.S.*, Associate Director of Agricultural Extension
HAUGEN, EINAR INGVALD, *Ph.D.*, Assistant Professor of Scandinavian Languages
HAVIGHURST, ROBERT JAMES, *Ph.D.*, Assistant Professor of Physics, Adviser in Experimental College
HAWLEY, LEE FRED, *Ph.D.*, Lecturer in Forest Products
HAYES, JOHN BARRY, *B.S.*, Associate Professor of Poultry Husbandry
HAZELTINE, MARY EMOGENE, *B.S.*, Principal of the Library School, Associate Professor of Bibliography
H'DOUBLER, MARGARET NEWELL, *M.A.*, Associate Professor of Physical Education
HEAN, CLARENCE SCOTT, *B.A.*, Librarian, College of Agriculture
HEIRONIMUS, JOHN PAUL, *Ph.D.*, Assistant Professor of Classics
HELLEBRANDT, FRANCES ANNA, *B.S., M.D.*, Assistant Professor of Physiology
HENDERSON, RUTH ADELE, *B.S., M.A.*, Assistant Professor in the Teaching of Home Economics
HENMON, VIVIAN ALLEN CHARLES, *Ph.D.*, Professor of Psychology, Director of Educational Guidance
HENRY, WILLIAM ARNON, *Sc.D., D. Agr.*, Professor of Agriculture, Emeritus
HENSEY, IRENE ANITA, *M.S.*, Assistant Professor of Accounting
HERRICK, CHESTER ALBERN, *Sc.D.*, Assistant Professor of Zoology and Veterinary Science
HERRIOTT, JAMES HOMER, *Ph.D.*, Assistant Professor of Spanish (on leave 1931-32)
HERWICK, ROBERT PORT, *Ph.D.*, State Toxicologist; Assistant Professor of Toxicology
HIBBARD, BENJAMIN HORACE, *Ph.D.*, Professor of Agricultural Economics (on leave II)
HIGBY, CHESTER PENN, *Ph.D.*, Professor of History
HILLSTROM, ELLEN GUNIMA, *M.A.*, Associate Professor of Home Economics
HINDERMAN, ROY AARON, *M.S.*, Lecturer in Education

HISAW, FREDERICK LEE, *Ph.D.*, Professor of Zoology
HOBSON, ASHER, *Ph.D.*, Professor of Agricultural Economics
HOFFMAN, AUSTIN CLAIR, *M.S.*, Assistant Professor of Agricultural Economics
HOHLFELD, ALEXANDER RUDOLF, *Ph.D.*, Professor of German
HOLDEN, EUGENE DAVENPORT, *M.S.*, Assistant Professor of Agronomy
HOLT, FRANK OSCAR, *Ph.M.*, Registrar, Executive Director of the Bureau of Guidance and Records
HOLT, HARRIETTE GRACE, *M.A.*, Assistant Professor of Mathematics, Extension Division
HOPKINS, ANDREW WINKLE, *B.L.*, Professor of Agricultural Journalism, Agricultural Editor
HOUGEN, OLAF ANDREAS, *Ch.E., Ph.D.*, Associate Professor of Chemical Engineering
HOYT, MRS. EDITH EVANS, *M.A.*, Assistant Professor of Education, Extension Division
HUFFER, CHARLES MORSE, *Ph.D.*, Assistant Professor of Astronomy, Assistant Astronomer
HUMPHREY, GEORGE COLVIN, *B.S.*, Professor of Animal Husbandry
HUNT, GEORGE MCMONIES, *B.S.*, Lecturer in Forest Products
HURSLEY, FRANK MCCALL, *M.A.*, Assistant Professor of English, Milwaukee Extension Center
HUSBAND, RICHARD WELLINGTON, *Ph.D.*, Assistant Professor of Psychology
HYDE, GRANT MILNOR, *M.A.*, Professor of Journalism
HYLAND, PATRICK HENRY, *M.E.*, Associate Professor of Machine Design

ILTIS, LEON LEONARD, *B.M.*, Assistant Professor of Music
INGERSOLL, LEONARD ROSE, *Ph.D.*, Professor of Physics
INGRAHAM, MARK HOYT, *Ph.D.*, Professor of Mathematics
IRWIN, MALCOLM ROBERT, *Ph.D.*, Assistant Professor of Agricultural Bacteriology and Genetics

JACKSON, HOWARD CAMPBELL, *Ph.D.*, Professor of Dairy Husbandry
JAMES, JOHN AMBROSE, *B.S.*, Assistant Dean of the College of Agriculture, Professor of Agricultural Education
JANDA, HAROLD FREDERICK, *C.E.*, Professor of Highway Engineering and City Planning
JANSKY, CYRIL METHODIUS, *B.A.*, Professor of Electrical Engineering, Extension Division and College of Engineering
JASTROW, JOSEPH, *Ph.D., LL.D.*, Professor of Psychology, Emeritus
JEROME, HARRY, *Ph.D.*, Professor of Economics
JOHNSON, ELIZABETH BARBARA, *B.S.*, Assistant Professor of Home Economics
JOHNSON, GERTRUDE ELIZABETH, *B.A.*, Associate Professor of Speech
JOHNSON, JAMES, *Ph.D.*, Professor of Horticulture
JOHNSON, LAURA BUTLER, *M.A.*, Assistant Professor in the Teaching of French
JONES, CHESTER LLOYD, *Ph.D.*, Professor of Economics and Political Science, Director of the School of Commerce
JONES, EDWARD RICHARD, *M.S.*, Professor of Agricultural Engineering
JONES, LEWIS RALPH, *Ph.D., Sc.D.*, Professor of Plant Pathology
JONES, MRS. NELLIE KEDZIE, *M.S., LL.D.*, State Leader of Home Demonstration Agents, Associate Professor of Home Economics
JONES, THOMAS EDWARD, *B.A., B.P.E.*, Professor of Physical Education
JONES, THOMAS LLOYD, *B.S.*, High-School Visitor, Associate Professor of Education (deceased September 3, 1931)

JUAIRE, MARION ABBIE, *M.S.*, Assistant Professor of Home Economics
JUDAY, CHANCEY, *M.A.*, Professor of Limnology

KAHLENBERG, LOUIS, *Ph.D.*, Professor of Chemistry
KAY, HARRY MAXWELL, *M.D.*, Associate in Clinical Medicine
KEITT, GEORGE WANNAMAKER, *Ph.D.*, Professor of Plant Pathology
KELLOCK, GRACE JEAN, *B.S., R.N.*, Assistant Professor of Nursing
KELLY, FREDERICK THOMAS, *Ph.D.*, Assistant Professor of Semitic Languages, Emeritus
KELSO, LESLIE ERSKINE ALLEN, *B.S.*, Assistant Professor of Electrical Engineering
KESSLER, LEWIS HANFORD, *M.S., C.E.*, Asst. Professor of Hydraulic Engineering
KIEKHOFER, WILLIAM HENRY, *Ph.D.*, Professor of Economics
KING, AGNES, *M.A.*, Assistant Professor of Library Science
KINNE, WILLIAM SPAULDING, *B.S.*, Professor of Structural Engineering; Consulting Engineer, Physical Plant
KIRK, GRAYSON LOUIS, *Ph.D.*, Assistant Professor of Political Science
KIRKPATRICK, ELLIS LORE, *Ph.D.*, Associate Professor of Rural Sociology
KITTEL, PAULA MARGARETHA, *Ph.D.*, Assistant Professor of German
KIVLIN, VINCENT EARL, *M.S.*, Assistant Professor of Agricultural Education; Director of the Short Course in Agriculture
KNAPLUND, PAUL ALEXANDER, *Ph.D.*, Professor of History
KOEHLER, ARTHUR, *M.S.*, Lecturer in Forest Products
KOEHLER, GLENN, *M.S.*, Assistant Professor of Electrical Engineering
KOLB, JOHN HARRISON, *Ph.D.*, Professor of Rural Sociology (on leave II)
KOMMERS, JESSE BENJAMIN, *M.E.*, Professor of Mechanics
KOWALKE, OTTO LOUIS, *Ch.E.*, Professor of Chemical Engineering
KRAUSKOPF, FRANCIS CRAIG, *Ph.D.*, Professor of Chemistry
KREMERS, EDWARD, *Pharm.M., Ph.D., Sc.D.*, Director of the Course in Pharmacy and of the Pharmaceutical Experiment Station, Professor of Pharmaceutical Chemistry
KUEHNER, CONRAD LOUIS, *B.S.*, Assistant Professor of Horticulture
KUNZE, HARRY LEWIS, *M.A., C.P.A.*, Assistant Professor of Accounting, Milwaukee Extension Center

LACEY, JAMES JEROME, *B.S.*, Assistant Professor of Animal Husbandry
LAIRD, ARTHUR GORDON, *Ph.D.*, Professor of Greek
LAMB, ELIZA, *B.A.*, Assistant Librarian
LANGER, RUDOLPH ERNEST, *Ph. D.*, Professor of Mathematics
LARSON, GUSTUS LUDWIG, *M.E.*, Professor of Steam and Gas Engineering; Consulting Engineer, Physical Plant
LATHROP, HENRY BURROWES, *B.A.*, Professor of English
LEITH, BENJAMIN DONALD, *B.S.*, Professor of Agronomy
LEITH, CHARLES KENNETH, *Ph.D., LL.D.*, Professor of Geology
LEONARD, WILLIAM ELLERY, Ph.D., Professor of English
LESCOHIER, DON DIVANCE, *Ph.D.*, Professor of Economics
LESTER, CLARENCE BROWN, *M.A.*, Director of the Library School, Lecturer in Library Science
LÉVÊQUE, ANDRÉ CAMILIE, *Licence en Droit*, Assistant Professor of French
LEVIS, GEORGE WYNDEN, *B.A.*, Associate Professor of Physical Education; Business Manager of Athletics
LIGHTY, WILLIAM HENRY, *Ph.B.*, Director of Extension Teaching, Extension Division
LINK, KARL PAUL, *Ph.D.*, Professor of Bio-Chemistry
LINTON, RALPH, *Ph.D.*, Professor of Social Anthropology

LITTIG, LAWRENCE, *B.S., M.D.*, Lecturer in Radiology.
LITTLE, GEORGE EDKIN, *B.S.*, Director and Professor of Physical Education
LITTLE, MALCOLM GILES, *M.A.*, Assistant Dean, Extension Division
LIVERMORE, JOSEPH DOW, *B.S.*, Assistant Professor of Drawing and Descriptive Geometry
LORENZ, WILLIAM FREDERICK, *M.D.*, Professor of Neuropsychiatry, Director of the Wisconsin Psychiatric Institute
LOWMAN, GUY SUMNER, *B.Di., B.P.E.*, Professor of Physical Education, Chairman of the Course in Physical Education and Athletic Coaching for Men
LUTHER, ERNEST LEONARD, *B.A., B.S.*, Superintendent of the Farmers' Institutes; Assistant State Leader of County Agricultural Representatives
LYGHT, CHARGES EVERARD, *M.D., C.M.*, Assistant Professor of Clinical Medicine; Assistant Physician, Department of Student Health
LYON, ALBERT EDDY, *Ph.D.*, Assistant Professor of Spanish

MCCAFFERY, RICHARD STANISLAUS, *E.M.*, Professor of Mining and Metallurgy
MCCOY, BRUCE RIEGE, *B.A.*, Lecturer in Journalism
MCCOY, ELIZABETH FLORENCE, *Ph.D.*, Assistant Professor of Agricultural Bacteriology
MCELVAIN, SAMUEL MARION, *Ph.D.*, Associate Professor of Chemistry
MCGILVARY, EVANDER BRADLEY, *Ph.D.*, Professor of Philosophy
MACGREGOR, FORD HERBERT, *M.A.*, Associate Professor of Political Science
MCINTOSH, ROSCOE LYLE., *B.S., M.D.*, Assistant Professor of Dermatology
MACLEAN, MALCOLM SHAW, *Ph.D.*, Assistant Director, Milwaukee Extension Center—I
MCNALL, PRESTON ESSEX, *M.S.*, Professor of Agricultural Economics
MCNAUL, JAMES WILBUR, *B.S.*, Assistant Professor of Machine Design
MCNEEL, WAKELIN, *B.S.*, Assistant State Leader of Boys' and Girls' Agricultural Clubs
MACK, JULIAN ELLIS, *Ph.D.*, Assistant Professor of Physics
MACKAY, SCOTT, *M.S.*, Associate Professor of Metallurgy
MANNING, HAZEL, *M.S.*, Professor of Home Economics
MARCH, HERMAN WILLIAM, *Ph.D.*, Professor of Mathematics
MARDEN, MORRIS, *Ph.D.*, Assistant Professor of Mathematics, Milwaukee Extension Center
MARKWARDT, LORRAINE JOSEPH, *C.E.*, Lecturer in Forest Products
MARLATT, ABBY LILLIAN, *M.S., Sc.D.*, Director of the Course in Home Economics, Professor of Home Economics
MARSHALL, WILLIAM STANLEY, *Ph.D.*, Associate Professor of Entomology
MARTIN, MILES J., *Ph.D.*, Associate Professor of Physics, Milwaukee Extension Center
MARTIN, THOMAS LEROY, *B.Ed., M.B.A., C.P.A.*, Assistant Professor of Accounting, Extension Division
MASLEY, ARPAD LOUIS, *G.G.*, Associate Professor of Physical Education; Director of the Men's Gymnasium
MASTEN, MABEL GARDEN, *B.S., M.D.*, Assistant Professor of Neuropsychiatry
MATHEWS, JOSEPH HOWARD, *Ph.D.*, Director of the Course in Chemistry and the Chemistry-Commerce Course, Professor of Chemistry
MAURER, EDWARD ROSE, *B.C.E.*, Professor of Mechanics
MEAD, DANIEL WEBSTER, *C.E.*, Professor of Hydraulic and Sanitary Engineering
MEAD, WARREN JUDSON, *Ph.D.*, Professor of Geology
MEADE, FRANK CELESTINE, First Lieutenant Signal Corps, U. S. A., Assistant Professor of Military Science
MEANWELL, WALTER ERNEST, *M.D., Dr.P.H.*, Professor of Physical Education

MEEK, WALTER JOSEPH, *Ph. D.*, Assistant Dean of the Medical School, Professor of Physiology

MEIKLEJOHN, ALEXANDER, *Ph.D., LL.D.*, Chairman of the Experimental College, Professor of Philosophy

MELOCHE, GLADYS LOUISE, *M.S.*, Extension Specialist in Home Economics

MELOCHE, VILLIERS WILLSON, *Ph.D.*, Assistant Professor of Chemistry

MENDENHALL, CHARLES ELWOOD, *Ph.D.*, Professor of Physics

MENDENHALL, MRS. DOROTHY REED, *B.A., M.D., Sc.D.*, Lecturer in Home Economics

MERRIMAN, CURTIS, *Ph.D.*, Professor of Education

MICHELL, ROBERT BELL, *Ph.D.*, Assistant Professor of French

MIDDLETON, WILLIAM SHAINLINE, *M.D.*, Associate Professor of Medicine

MILLAR, ADAM VAUSE, *M.S.*, Assistant Dean of the College of Enginering, Professor of Drawing and Descriptive Geometry

MILLER, ERIC REXFORD, *M.S.*, Lecturer in Meteorology

MILLER, WILLIAM SNOW, *M.D., Sc.D.*, Professor of Anatomy, Emeritus

MILLINGTON, PAUL EMANUEL, *Ph.D.*, Assistant Professor of Chemistry, Milwaukee Extension Center

MILLS, CHARLES HENRY, *D.Mus., F.R.C.O.*, Director of the School of Music, Professor of Music

MILWARD, JAMES GARFIELD, *M.S.*, Professor of Horticulture

MOORE, JAMES GARFIELD, *M.S.*, Professor of Horticulture

MOORE, RANSON ASA, Professor of Agronomy

MORGAN, BAYARD QUINCY, *Ph.D.*, Professor of German

MORPHY, EDSON WILFRED, Associate Professor of Music

MORRIS, SARAH ISABELLE, *M.D.*, Associate Professor of Clinical Medicine (on leave 1931-32)

MORTENSON, OTTO AXEL, *M.S., M.D.*, Assistant Professor of Anatomy

MORTENSON, WILLIAM PETER, *Ph.D.*, Assistant Professor of Agricultural Economics (on leave II)

MORTIMER, GEORGE BYRON, *B.S.*, Professor of Agronomy

MORTON, WALTER ALBERT, *Ph.D.*, Associate Professor of Economics (on leave 1931-32)

MOSSMAN, HARLAND WINFIELD, *Ph.D.*, Assistant Professor of Anatomy

MOULTON, FRANK STILLMAN, *A.I.A.*, Lecturer in Art Education

MOWRY, WILLIAM ATWOOD, *M.D.*, Professor of Clinical Medicine; Physician in Chief, Department of Student Health

MUCKS, ARLIE MAX, *B.S.*, Associate Professor of Animal Husbandry

MURPHY, GEORGE WILLIAM, Assistant Professor of Physical Education

MUSBACH, FRED LUDWIG, *B.S.*, Professor of Soils, in charge of Marshfield Branch Experiment Station

NAFZIGER, RALPH OTTO, *B.S., M.A.*, Assistant Professor of Journalism

NEFF, EZRA EUGENE, *B.A., M.D.*, Associate Professor of Ophthalmology

NELSON, DELMAR WOOD, *M.E.*, Assistant Professor of Steam and Gas Engineering

NELSON, GLENN HENDERSON, *B.S., Ph.M.*, Lecturer in Education

NESBIT, WELLWOOD MACK, *M.D.*, Associate Professor of Orolarynology

NETTELS, CURTIS PUTNAM, *Ph.D.*, Associate Professor of History

NEWLIN, JOHN A., *B.S.*, Lecturer in Forest Products

NICHOLS, MERLE STARR, *Ph.D.*, Chemist, State Laboratory of Hygiene; Assistant Professor of Sanitary Chemistry

NICKERSON, FRANK, Assistant Professor of Physical Education

NOHR, ROBERT, JR., *G.G.*, Associate Professor of Physical Education

NOLAND, LOWELL EVAN, *Ph.D.*, Associate Professor of Zoology

OESTERLE, JOSEPH FRANCIS, *Ph.D.*, Assistant Professor of Metallurgy
OGG, FREDERICK AUSTIN, *Ph.D., LL.D.*, Professor of Political Science (on leave II)
OLSON, JULIUS EMIL, *B.L.*, Professor of Scandinavian Languages and Literature, Emeritus
ORSINGER, REMINGTON, *B.S.*, Captain of Infantry, U. S. A., Assistant Professor of Military Science
ORTEGA, JOAQUIN, *M.A.*, Professor of Spanish
ORTH, HERBERT DENNY, *B.S.*, Associate Professor of Drawing and Descriptive Geometry
O'SHEA, MICHAEL VINCENT, *B.L.*, Professor of Education (deceased Jan. 14, 1932)
OTIS, DELOS SACKET, *Ph.D.*, Assistant Professor of History; Adviser in the Experimental College
OTTO, MAX CARL, *Ph.D.*, Professor of Philosophy
OVERTON, JAMES BERTRAM, *Ph.D., Sc.D.*, Professor of Plant Physiology
OWEN, EDWARD THOMAS, *Ph.D.*, Professor of French and Linguistics, Emeritus (deceased Nov. 9, 1931)
OWEN, RAY SPRAGUE, *B.S.*, Associate Professor of Topographic Engineering

PAGE, WILLIAM HERBERT, *B.A., LL.M., S.J.D.*, Jackson Professor of Law
PARKINSON, GEORGE AMBROSE, *Ph.D.*, Associate Professor of Mathematics, Milwaukee Extension Center
PARSONS, HELEN TRACY, *Ph.D.*, Associate Professor of Home Economics
PATTERSON, HELEN MARGUERITE, *M.A.*, Assistant Professor of Journalism
PATTON, STELLA TROUT, *M.S.*, Assistant Professor of Home Economics
PAUL, BENSON HOWARD, *M.S.*, Lecturer in Forest Products
PAUL, FRANCIS, *M.D.*, Clincial Associate in Neuropsychiatry
PAXSON, FREDERIC LOGAN, *Ph.D.*, Professor of History
PERLMAN, SELIG, *Ph.D.*, Professor of Economics
PERSON, PHILIP HILMORE, *Ph.D.*, Assistant Professor of Sociology, Milwaukee Extension Center
PETERSON, WILLIAM HAROLD, *Ph.D.*, Professor of Agricultural Chemistry
PHILLIPS, BURR WENDELL, *M.A.*, Assistant Professor in the Teaching of History
PHILLIPS, JAMES DAVID, *B.S.*, Business Manager
PITMAN, ANN MARIA, *Ph.D.*, Associate Professor of Classics, Extension Division
POHLE, ERNST ALBERT, *M.D., Ph.D., F.A.C.R.*, Professor of Radiology
POOLEY, ROBERT CECIL, *M.A.*, Assistant Professor in the Teaching of English
POTTER, PITMAN BENJAMIN, *Ph.D.*, Professor of Political Science
PRICE, JOHN REESE, *B.S.*, Professor of Electrical Engineering
PRICE, WALTER VAN, *Ph.D.*, Professor of Dairy Husbandry
PRYOR, MARGARET, *Ph.D.*, Assistant Professor of Economics
PUERNER, RUSSELL EDWARD, *B.S.*, Assistant Professor of Machine Design
PUESTOW, KARVER LOUIS, *M.S., MD.*, Assistant Professor of Clinical Medicine
PULVER, HARRY E., *C.E.*, Professor of Civil and Structural Engineering, Extension Division
PURIN, CHARLES MALTADOR, *Ph.D.*, Director of the Milwaukee Extension Center, Professor of German
PYRE, JAMES FRANCIS AUGUSTIN, *Ph.D.*, Professor of English, Chairman of the Athletic Council

QUINTANA, RICARDO BECKWITH, *Ph.D.*, Associate Professor of English

RAGATZ, ROLAND ANDREW, *M.S.*, Assistant Professor of Chemical Engineering
RAGSDALE, CLARENCE EDWIN, *Ph.D.*, Assistant Professor of Education

RANDOLPH, MRS. RUTH SACKETT, *B.S.*, Assistant Professor of Home Economics (on leave II)
RAUSHENBUSH, PAUL A., *B.A.*, Assistant Professor of Economics, Adviser in Experimental College, (on leave II)
REBER, LOUIS EHRARD, *M.S., Sc.D.*, Dean of the Extension Division, Emeritus
REELY, MARY KATHARINE, *B.A.*, Assistant Professor of Bibliography
REESE, HANS HEINRICH, *M.D., F.A.C.P.*, Associate Professor of Neuropsychiatry
REINEKING, WALTER CLARENCE, *B.A., M.D.*, Lecturer in Medicine
REYNOLDS, MRS. MAY STALLER, *M.S.*, Assistant Professor of Home Economics
REYNOLDS, ROBERT LEONARD, *Ph.D.*, Assistant Professor of History
RICE, WILLIAM GORHAM, JR., *M.A., S.J.D.*, Professor of Law
RICHARDS, CLARICE AUDREY, *Ph.D.*, Lecturer in Forest Products
RICHTMANN, WILLIAM OSCAR, *Ph.G., Ph.D.*, Associate Professor of Pharmacognosy
RIKER, ALBERT JOYCE, *Ph.D.*, Professor of Plant Pathology
RILEY, MILES CHARLES, *LL.B.*, Lecturer in Agricultural Economics
RITCHIE, GORTON, *B.A., M.D.*, Assistant Professor of Pathology
RITTER, GEORGE JOSEPH, *Ph.D.*, Lecturer in Forest Products
ROARK, RAYMOND JEFFERSON, *M.S.*, Associate Professor of Mechanics
ROBERTS, RAY HARLAND, *Ph.D.*, Professor of Horticulture
ROCKWELL, ETHEL THEODORA, *B.A.*, Chief of the Bureau of Dramatic Activities and Assistant Professor of Speech, Extension Division
ROE, FREDERICK WILLIAM, *Ph.D., Litt.D.*, Professor of English
ROEBUCK, JOHN RANSOM, *Ph.D.*, Professor of Physics
ROGERS, HARRY LOVEJOY, JR., First Lieutenant of Infantry, U. S. A., Assistant Professor of Military Science
ROGERS, SAMUEL GREENE ARNOLD, *M.A.*, Associate Professor of French
ROSS, EDWARD ALSWORTH, *Ph.D., LL.D.*, Professor of Sociology (on leave II)
ROSS, SARAH GRIDLEY, *M.A.*, Hostess of Barnard Hall
ROTH, WILLIAM EDWARD, *Ph.D.*, Assistant Professor of Mathematics, Milwaukee Extension Center
ROWLANDS, WALTER AUGUSTUS, *B.S.*, Associate Professor of Agricultural Engineering, Assistant State Leader of County Agricultural Representatives
RUNDELL, OLIVER SAMUEL, *LL.B.*, Professor of Law, Acting Dean of the Law School
RUNGE, ALMA MATILDA, *B.A.*, Assistant Professor of Library Science
RUPEL, ISAAC WALKER, *M.S.*, Assistant Professor of Animal Husbandry
RUSSO, JOSEPH LOUIS, *Ph.D.*, Associate Professor of Italian
RYAN, HEBER HINDS, *Ph.D.*, Principal of the Wisconsin High School, Associate Professor of Education

SALTER, ELIZABETH M., *B.S.*, Assistant State Leader of Boys' and Girls' Agricultural Clubs
SALTER, JOHN THOMAS, *Ph.D.*, Associate Professor of Political Science (on leave 1931-32)
SAMMIS, JOHN LANGLEY, *Ph.D.*, Associate Professor of Dairy Husbandry
SANBORN, JOHN BELL, *Ph.D.*, Lecturer in Law
SAUNDERS, LAURANCE JAMES, *M.A.*, Associate Professor of History
SAUTHOFF, AUGUST, *B.S., M.D.*, Clinical Associate in Neuropsychiatry
SCHLATTER, EDWARD BUNKER, *Ph.D.*, Professor of Romance Languages, Extension Division
SCHLICHER, JOHN JACOB, *Ph.D.*, Assistant Professor of Latin
SCHLOMOVITZ, BENJAMIN HERMAN, *M.D.*, Lecturer in Physiology, Milwaukee Extension Center—II
SCHMIDT, ERWIN RUDOLPH, *B.A., M.D., F.A.C.S.*, Professor of General Surgery

SCHNAITTER, MARION REXFORD, *M.A.*, Associate Porfessor of Economics, Milwaukee Extension Center
SCHUETTE, HENRY AUGUST, *Ph.D.*, Associate Professor of Chemistry
SCHUMM, HERMAN CHARLES, *B.S., M.D., F.A.C.S.*, Associate Professor of Orthopedic Surgery
SCOTT, ALMERE LOUISE, *B.A.*, Director, Department of Debating and Public Discussion, Extension Division
SCOTT, WILLIAM AMASA, *Ph.D., LL.D.*, Professor of Economics (Emeritus II)
SEARLS, EDWARD MARLBOROUGH, *M.S.*, Assistant Professor of Economic Entomology
SEEVERS, MAURICE HARRISON, *Ph.D.*, Assistant Professor of Pharmacology
SELLERY, GEORGE CLARK, *Ph.D., LL.D.*, Dean of the College of Letters and Science, Professor of History
SENN, ALFRED, *Ph.D.*, Professor of Germanic and Indo-European Philology
SEVRINGHAUS, ELMER LOUIS, *M.A., M.D.*, Associate Professor of Medicine
SHANDS, RUEBUSH GEORGE, *Ph.D.*, Assistant Professor of Agronomy
SHARP, FRANK CHAPMAN, *Ph.D.*, Professor of Philosophy
SHARP, MALCOLM PITMAN, *M.A., LL.B., S.J.D.*, Associate Professor of Law
SHARP, WALTER RICE, *Docteur en Droit*, Associate Professor of Political Science (on leave 1931-32)
SHERRARD, EARL CHARLES, *Ph.D.*, Lecturer in Forest Products
SHIELS, KENNETH GRINNELL, *M.S.*, Assistant Professor of Drawing and Descriptive Geometry
SHOREY, EDWIN ROY, *E.M.*, Associate Professor of Mining and Metallurgy
SHOWERMAN, GRANT, *Ph.D.*, Professor of Classics (on leave I)
SHROCK, ROBERT RAKES, *Ph.D.*, Assistant Professor of Geology
SISK, IRA ROSCOE, *Phar.D., M.D., F.A.C.S.*, Professor of Urology
SISK, JOSEPH NEWTON, *B.S., M.D.*, Lecturer in Radiology
SKINNER, ERNEST BROWN, *Ph.D.*, Professor of Mathematics
SLICHTER, CHARLES SUMNER, *Sc.D.*, Dean of the Graduate School, Professor of Applied Mathematics
SMITH, MRS. AMY HOYT, *M.A.*, Recorder, Extension Division
SMITH, CHARLES AUGUSTUS, *M.A.*, Secretary of the Faculty
SMITH, CHARLES FORSTER, *Ph.D., LL.D.*, Professor of Greek and Classical Philology, Emeritus (deceased August 3, 1931)
SMITH, HOWARD LESLIE, *B.A., LL.B.*, Professor of Law, Emeritus
SMITH, HUGH ALLISON, *M.A.*, Professor of French
SMITH, LEONARD SEWELL, *C.E.*, Professor of Highway Engineering and City Planning, Emeritus
SMITH, WALTER MCMYNN, *B.A.*, University Librarian
SNELL, CHESTER DEFOREST, *B.H., B.S.*, Dean of the Extension Division
SOKOLNIKOFF, IVAN STEPHEN, *E.E.*, Assistant Professor of Mathematics
SOLALINDE, ANTONIO GARCIA, *Litt.D.*, Professor of Spanish
SOMMER, HUGO HENRY, *Ph.D.*, Professor of Dairy Husbandry
SORUM, CLARENCE HARVEY, *Ph.D.*, Assistant Professor of Chemistry
SPEARS, CLARENCE W.
STAMM, ALFRED J., *Ph.D.*, Lecturer in Forest Products
STEBBINS, JOEL, *Ph.D., Sc.D.*, Director of Washburn Observatory, Professor of Astronomy (on leave I)
STEBBINS, ROLAND STEWART, *R.M.A.A.*, Assistant Professor of Art Education
STEENBOCK, HARRY, *Ph.D.*, Professor of Agricultural Chemistry
STEINAUER, JOSEPH CHRISTIAN, Associate Professor of Physical Education
STEINFORT, META MARY, *M.A.*, Associate Professor of Spanish, Milwaukee Extension Center
STERLING, SUSAN ADELAIDE, *M.L.*, Assistant Professor of German, Emeritus

STEVE, WILLIAM FREDERICK, *M.A.*, Associate Professor of Physics
STILLMAN, GLADYS SARAH, *M.S.*, Assistant Professor of Home Economics
STONE, ALDEN LESCOMBE, Associate Professor of Agronomy
STOUFFER, SAMUEL ANDREW, *Ph.D.*, Assistant Professor of Social Statistics (on leave 1931-32)
STOVALL, WILLIAM DAVIDSON, *M.D.*, Director and Bacteriologist, State Laboratory of Hygiene; Professor of Hygiene
STREVEY, TRACY ELMER, *Ph.D.*, Assistant Professor of History, Milwaukee Extension Center
SULLIVAN, WALTER EDWARD, *Ph.D.*, Professor of Anatomy
SUMNER, WILLIAM ALLISON, *Ph.M.*, Associate Professor of Agricultural Journalism
SUNDT, GUY MERRILL, *B.S.*, Associate Professor of Physical Education
SWAN, FRED HAVISIDE, *B.A.*, Assistant Professor of Physical Education
SWINNEY, EDWARD EARLE, *B.A.*, Associate Professor of Music

TATUM, ARTHUR LAWRIE, *Ph.D., M.D.*, Professor of Pharmacology
TAYLOR, CARL, *M.A.*, Assistant Professor of Speech, Milwaukee Extension Center
TAYLOR, WILLIAM BAYARD, *Ph.D.*, Associate Professor of Finance
TAYLOR, WARNER, *M.A.*, Professor of English
TEISBERG, HALVOR ORLANDO, *B.A.*, Assistant Librarian
TENNEY, HORACE KENT, JR., *M.D.*, Assistant Professor of Pediatrics
THISTLETHWAITE, GLENN F., *B.S.*, Professor of Physical Education
THOMAS, CHARLES WRIGHT, *B.S., M.A.*, Assistant Professor of English
THOMSEN, LOUIS CHARLES, *B.S.*, Assistant Professor of Dairy Husbandry
THORNBURY, ETHEL MARGARET, *Ph.D.*, Assistant Professor of English
THWAITES, FREDRIK TURVILLE, *M.A.*, Lecturer in Geology
TIBBITTS, CLARK, *B.S.*, Lecturer in Sociology—II
TIEMANN, HARRY DONALD, *M.E., M.F.*, Lecturer in Forest Products
TORGERSON, THEODORE L., *Ph.D.*, Assistant Professor of Education
TOTTINGHAM, WILLIAM EDWARD, *Ph.D.*, Associate Professor of Agricultural Chemistry
TOWN, GEORGE GALLOWAY, *Ph.D.*, Associate Professor of Chemistry, Milwaukee Extension Center
TRACY, GORDON FREDERICK, *M.S.*. Assistant Professor of Electrical Engineering
TREWARTHA, GLENN THOMAS, *Ph.D.*, Associate Professor of Geography
TRILLING, BLANCH MATHILDE, *B.A.*, Chairman of the Course in Physical Education for Women, Professor of Physical Education
TROUTMAN, WILLIAM CHILTON, *M.A.*, Associate Professor of Speech
TROXELL, MRS. LOUISE FLEMING, *B.S., B.A.*, Dean of Women
TRUAX, THOMAS ROY, *M.S.*, Lecturer in Forest Products
TRUMBOWER, HENRY ROSCOE, *Ph.D.*, Professor of Economics
TRUOG, EMIL, *M.S.*, Professor of Soils
TURNEAURE, FREDERICK EUGENE, *C.E., D.Eng.*, Dean of the College of Engineering
TWADDELL, WILLIAM FREEMAN, *Ph.D.*, Assistant Professor of German
TWENHOFEL, WILLIAM HENRY, *Ph.D.*, Professor of Geology (on leave II)

UTERITZ, IRWIN CHARLES, *B.A.*, Associate Professor of Physical Education

VAN HAGAN, LESLIE FLANDERS, *C.E.*, Professor of Railway Engineering
VAN VALZAH, ROBERT, *B.A., M.D.*, Professor of Clinical Medicine
VAN VLECK, EDWARD BURR, *Ph.D., LL.D., D.M.* and *Phys., Sc.D.*, Professor of Mathematics, Emeritus
VAN VLECK, JOHN HASBROUCK, *Ph.D.*, Professor of Physics

VARNEY, VERNE VINCENT, *B.S.*, Assistant State Leader of Boys' and Girls' Clubs
VARNUM, WILLIAM HARRISON, *B.P.*, Professor of Art Education
VASILIEV, ALEXANDER ALEXANDER, *Ph.D.*, Professor of History
VAUGHAN, RICHARD ENGLISH, *M.S.*, Professor of Plant Pathology
VOLK, FREDERICK EUGENE, *B.A.*, *B.S.*, Librarian, College of Engineering
VON GRUENINGEN, JOHN PAUL, *Ph.D.*, Lecturer in German
VOSS, ERNST KARL JOHANN HEINRICH, *Ph.D.*, Professor of Germanic Philology, Emeritus

WAGNER, GEORGE, *M.A.*, Professor of Zoology
WAHLIN, HUGO BERNARD, *Ph.D.*, Associate Professor of Physics
WAKEMAN, NELLIE ANTOINETTE, *Ph.D.*, Assistant Professor of Pharmacy
WALES, JULIA GRACE, *Ph.D.*, Assistant Professor of English
WALKER, JOHN CHARLES, *Ph.D.*, Professor of Plant Pathology
WALLERSTEIN, RUTH COONS, *Ph.D.*, Assistant Professor of English
WALTON, JAMES HENRI, *Ph.D.*, Professor of Chemistry
WATERS, RALPH MILTON, *B.A.*, *M.D.*, Associate Professor of Surgery (Anesthesia)
WATSON, JAMES WEBSTER, *B.S.*, Professor of Electrical Engineering
WATTS, OLIVER PATTERSON, *Ph.D.*, *Sc.D.*, Associate Professor of Chemical Engineering
WEAR, JOHN BREWSTER, *B.A.*, *M.D.*, Assistant Professor of Urology
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JOHANSEN, JOHN PETER, *M.A.*, Honorary Fellow in Sociology—I
JOHNS, CYRIL KAY, *M.S.*, Fellow in Agricultural Bacteriology
JOHNSON, MARVIN JOYCE, *B.A.*, *M.S.*, Fellow in Agricultural Chemistry
JORDAHL, OLAF MELVIN, *B.A.*, *M.S.*, Fellow in Physics
JUSTICE, ROBERT SHERMAN, *B.S.*, Fritzsche Brothers Fellow in Pharmacy

KECK, ESTHER RUTHERFORD, *M.A.*, Mary M. Adams Fellow in English
KELLY, MARTIN FRANCIS, *B.S.*, Industrial Fellow in Dairy Husbandry
KELSO, MAURICE MAYTUM, *M.S.*, Fellow in Agricultural Economics
KING, ROLAND W. P., *M.S.*, Fellow in Electrical Engineering
KINGERY, WILLIAM RAY, *M.A.*, Fellow in Spanish and Portuguese
KISER, FANNYBELLE, *B.A.*, Honorary Scholar in Latin
KLINE, BERNARD, *B.S.*, Industrial Fellow in Agricultural Chemistry
KNECHTGES, OSWALD JOHN, *M.S.*, Research Fellow in Hydraulic Engineering
KNOWLES, HENRY ROBERT, *B.S.*, Commonwealth Fund Fellow in Agricultural Chemistry
KRAMER, FRANK RAYMOND, *B.A.*, Fellow in Greek
KRAUS, OTTO PROTEUS, *M.A.*, Honorary Scholar in German; Seminary Endowment Fellow—II
KUCKUK, MRS. ZINA PARLETTE, *M.S.*, Industrial Fellow in Agricultural Bacteriology

LAMBECK, DOROTHY, MARIE, *B.A.*, Scholar in Mathematics
LANDER, CAROLINE ABIGAIL, *M.S.*, Fellow in Botany
LARSON, HARALD CHRISTIAN, *M.S.*, Fellow in Agricultural Economics
LARSON, HAROLD W. E., *M.S.*, Fellow in Soils
LARSON, HARRY, *M.S.*, Fellow in Hydraulic Engineering
LATHROP, ANDREW WILLIAM, *M.S.*, Industrial Fellow in Animal Husbandry

LEAHEY, ALFRED, *M.S.*, Honorary Scholar in Geology
LEASE, ELMER JOHN, *B.S.*, National Research Fellow in Agricultural Chemistry
LIU, JU CHIANG, *M.S.*, Rochefeller, Foundation Fellow in Botany
LOHMAN, JOSEPH, *B.A.*, Scholar in Sociology
LOHR, CARLETON ELI, *B.A.*, Henry Gund Scholar in German
LOOMIS, ROBERT MORTON, *B.A.*, Fellow in Political Science
LUDBROOK, WALLIS VERCO, *M.S.*, Honorary Fellow in Plant Pathology

MCCULLOCH, ERNEST CARR, *D.V.M.*, *M.A.*, Industrial Fellow in Veterinary Science and Agricultural Becteriology
MCQUEEN, ETHEL JEAN, *B.A.*, Scholar in Philosophy
MAGNUSON, HARRY P., *M.S.*, Honorary Fellow in Soils
MANGOLD, FREDERICK ROGERS, *B.A.*, Annie Gorham Fellow in Spanish
MASON, JOHN BROWN, *B.A.*, Honorary Fellow in Political Science—II
MAYOR, JOHN ROBERTS, *B.S.*, *M.A.*, Fellow in Mathematics
MESLOW, EDWIN, CORNELL, *B.S.*, Industrial Scholar in Industrial Education
MESSERSCHMIDT, BERNICE KATHERINE, *B.S.*, Industrial Fellow in Agricultural Bacteriology
MINNE, NELS, *B.A.*, *M.S.*, Fellow in Chemistry
MOLAND, OSCAR GERHARD, *B.A.*, Ripon College Scholar in Anatomy
MORGAN, CHARLES LEE, *M.S.*, Honorary Fellow in Animal Husbandry
MORGENROTH, ERNEST JOHANNES, *Ph.D.*, Industrial Fellow in Soils
MUNRO, SANFORD STERLING, *M.S.*, Fellow in Genetics

NICHOLSON, DONALD HANLIN, *M.A.*, Honorary Scholar in History
NORMAN, ARTHUR GOEFFREY, *B.S.*, Rockefeller Foundation Fellow in Agricultural Bacteriology
NORRIS, LEITHTON CYRUS, *B.S.*, Lloyd Fellow in Pharmacy

OELSCHLAGER, VICTOR RUDOLPH BERNHARDT, *B.A.*,Scholar in Spanish
ONCLEY, JOHN LAWRENCE, *B.A.*, Charles A. Coffin Foundation Fellow in Chemistry
O'NEILL, MARION, *B.S.*, Milwaukee Downer College Scholar in Home Economics
OZER, SOL DAVID, *M.A.*, Fellow in Sociology

PASCHAL, ELIZABETH, *M.A.*, Fellow in Economics
PENNEY, WILLIAM GEORGE, *Ph.D.*, Commonwealth Fund Fellow in Physics
PERRIGO, HAROLD WILLIAM, *M.A.*, Fellow in Economics
PESSIN, JOSEPH, *M.A.*, Fellow in Psychology
PHILLIPS, PAUL H., *B.S.*, Industrial Fellow in Animal Husbandry
POWER, JOHN DALE, *B.A.*, Scholar in Economics
PRUESS, LOUIS MARTIN, *Ph.D.*, Research Fellow in Agricultural Chemistry and Agricultural Bacteriology

ROSSMANN, ZRSULA M. L., *Ph.D.*, Honorary Scholar in German

ST. CLAIR, KENNETH EDSON, *B.A.*, Lawrence College Scholar in History
SALLANS, BRYCE JOHN, *B.A.*, *M.S.*, Honorary Scholar in Plant Pathology
SAMUELSON, EMIL EMANUEL, *M.A.*, Fellow in Education
SAPPINGTON, NEWTON OWEN, *M.A.*, Fellow in European History
SCHAENZER, JOSEPH PETER, *B.S.*, Industrial Fellow in Agricultural Engineering
SCHLAPP, ROBERT, *Ph.D.*, Rockefeller Foundation Fellow in Physics
SCHWARTING, ALBERT CLARENCE, *B.A.*, Scholar in European History
SHANNON, JASPER BERRY, *M.A.*, Honorary Fellow in Political Science
SHAW, LUTHER, *M.S.*, Fellow in Plant Pathology

SILVEUS, MARIAN, *M.A.*, Honorary Scholar in History
SMITH, ALBERT LORENZO, *M.S.*, Fellow in Plant Pathology
SONDERN, CLARENCE WILLIAM, *M.S.*, Fritzsche Brothers Fellow in Pharmacy
SQUIRES, HENRY DAYTON, *Ph.D.*, Honorary Fellow in Geology
STANLEY, ERNEST BROOKE, *M.S.*, Honorary Fellow in Animal Husbandry
STEPHENS, KARL, *Ph.D.*, Rockefeller Foundation Fellow in Econmics
STILL, BAYRD, *M.A.*, Fellow in History
STRANGE, C. ROY, *D.V.M.*, Fellow in Veterinary Science—I

TAYLOR, GLEN SEYMOUR, *B.A.*, Beloit College Scholar in Sociology
TEMPLETON, HUGH LONGWILL, *Ph.D.*, Industrial Fellow in Dairy Husbandry
TEMPLIN, VERA MAY, *M.A.*, Industrial Fellow in Agricultural Chemistry
THARP, WILLIAM HARDY JR., *M.S.*, Industrial Fellow in Plant Pathology
THOMAS, BART EDWARD, *B.A.*, Honorary Fellow in Spanish
THOMSON, JAMES, EDGAR, *M.A.*, Honorary Fellow in Geology
TIBBALS, MARJORIE MOORE, *M.A.*, Fellow in Latin
TILLMAN, NATHANIEL PATRICK, *M.A.*, Mary M. Adams Fellows in English
TODD, WILBERT REMINGTON, *M.S.*, Fellow in Agricultural Chemistry
TROTTER, IDE PEEBLES, *M.S.*, Honorary Scholar in Rural Sociology
TUTTLE, ALVA MAURICE, *M.S.*, Fellow in Mathematics
TYNER, EDWARD HENRY, *B.S.*, Scholar in Soils
TYNER, HOWARD DALE, *M.S.*, Honorary Scholar in Chemistry

VAN AKKEREN, LEON ABRAHAM, *B.A.*, Carroll College Scholar in Chemistry
VAN DONK, EVELYN CAROL, *B.S.*, Industrial Fellow in Agricultural Chemistry
VILJOEN, MRS. HELEN GILL, *Ph.D.*, Markham Traveling Fellow in English
VINSON, GRACE ESTHER, *M.A.*, Fellow in Education
VOLK, NORMAN JAMES, *M.S.*, Industrial Fellow in Soils

WALKER, ARTHUR HENRY, *B.S.*, Research Fellow in Animal Husbandry
WALKER, MARY JOSEPHINE, *M.A.*, Fellow in Education
WHITGROVE, HELEN GOOLD, *B.S.*, Industrial Fellow in Agricultural Bacteriology
WHITNEY, WILLIAM PERCY, *M.S.*, Research Fellow in Mining and Metallurgy
WHITTEN, JENNIE ALMA, *M.A.*, Honorary Fellow in German
WIGGINS, FORREST ORAN, *B.A.*, Fellow in Philosophy
WILLIAMS, GORDON CURRAN, *B.S.*, Fellow in Chemical Engineering
WILSON, PERRY WILLIAM, *M.S.*, Research Fellow in Agricultural Bacteriology and Agricultural Chemistry
WOO, WILLIAM (HUA FUH), *Ph.D.*, Honorary Scholar in Engineering
WOOLLEY, GEORGE WALTER, *B.S.*, Fellow in Genetics
WORMELI, BENJAMIN, C., *B.S.*, Research Fellow in Agricultural Chemistry and Poultry Husbandry
WRUBLE, MILTON, *M.S.*, Hollister Fellow in Pharmacy

YOVITCH, ZLATOJE, J., *M.A.*, Honorary Fellow in Agricultural Economics

FACULTY SUMMARY
1931-32

Rank	Men	Women	TOTAL
President, Registrar, and Deans	10	1	11
Directors of Schools	3	1	4*
Professors	209 (18)	3	212 (18)
Associate Professors	104 (1)	19	123 (1)
Assistant Professors	142 (3)	50 (2)	192 (5)
Lecturers (small part of time)	43 (8)	4 (1)	47 (9)
Clinical Associates (small part of time)	4	0	4
Research Associates (includes State Associates)	5	2	7
Instructors	265 (12)	104 (5)	369 (17)
Assistants (mainly half time)	312 (22)	106 (6)	418 (28)
Research Assistants (mainly half time)	116 (3)	17	133 (3)
Clinical Assistants	2	0	2
Totals	1,215 (67)	307 (14)	1,522 (81)

Numbers in parenthesis indicate faculty members who were here for only one semester either by appointment or because of resignation, leave for one semester, or death. These numbers are included in the totals for men and women by ranks. Totals also include members on leave for the year as indicated in table below.

*All professors except the director of the Library School, who is a lecturer.

THE ABOVE TABLE INCLUDES:

a. Members of the instructional and research staffs at Madison.
b. Extension workers throughout the State, including the Milwaukee Center.
c. Administrative officers and librarians having the rank of any member of the instructional staff.
d. The following who were on leave for the entire year:

	Men	Women	Total
Professors	2	0	2
Associate Processors	5	3	8
Assistant Professors	3	0	3
Instructors	0	1	1
Totals	10	4	14

THE TABLE DOES NOT INCLUDE:

a. The following emeritus memebers of the faculty:

President	1	0	1
Dean	1	0	1
Professors	12	0	12
Assistant Professors	1	3	4
Totals	15	3	18

b. The following persons without faculty rank:

Administrative Staff	18	11	29
Hygienic Laboratory Staff	0	4	4
Library Staff	1	21	22
State Geologist's Staff	2	0	2
Totals	21	36	57

c. Fellows and Scholars:

Fellows	108	19	127
Scholars	34	13	47
Totals	142	32	174

d. Undergraduate Assistants 10 1 11

PUBLIC LECTURES

ACADEMIC YEAR 1931-32

1931

July 24—R. A. Fisher—"The Analysis of Variance in Relation to the Design of Experiments."
July 25—R. A. Fisher—"Biometric Treatment of Small Samples."
October 12—Kathryn McHale—"Current Trends in Changes and Experiments in Liberal Arts Education."
October 28—M. Palyi—"The International Capital Market in Crisis."
November 3—Charles T. Seltman—"Athenian Vases and Their Painters."
November 4—Auguste V. Desclos—"Ideals of French Education."
November 13—Edgar L. Hewitt—"Mexico in 1931."
November 23—Schulze Gaevernitz—"World Depression, Causes and Cure."
November 30—Eugen Gustav Steinhof—"Stage Decoration and the Modern Point of View."
December 3—Harold E. Palmer—"A New Technique in Language Study."
December 7—H. T. Wijdeweld—"Trends in Modern Architecture from the International Viewpoint."
December 10—Carol Aronovici—"The City of Tomorrow."

1932

January 5-8—Eliot Blackwelder, five lectures on "Geological Processes in the Desert."
January 6—Friedrich von der Leyen—"Folklore and Fairy Tales."
January 7—Friedrich von der Leyen—"Die Blutezeit des Mittelalters in deutscher Dichtung."
January 13—Louis E. Lord—"Excavating the Athenian Agora."
January 15—Preston E. James—"Travels in Brazil."
February 11—Marvin Lowenthal—"Morocco: The Last Stand of the Middle Ages."
February 15—Maximo M. Kalaw—"The Demand for Philippine Freedom."
February 19—Clara M. Liepman—"The Community Program for Crime Prevention," and "Fundamentals of the German Legal System, Penal Law and Penal Procedure."
February 29—Louis Fischer—"The Soviets in World Affairs."
March 4—Einar Haugen—"O. E. Rolvaag, Author, Man and Prophet."
March 11—William A. Robson—"Recent Trends in English Local Government."
March 14—Herbert A. Miller—"Race Relations in the Modern World."
March 18—Moises Saenz—"The Genius of Mexico."
March 23—Bernard Fay—"Andre Gide Et L'Evolution de la Prose Contemporaine."
April 12—Eugen Kuhnemann—"The Youthful Goethe."
April 15—Paul H. Nesbitt—"The Development of Aboriginal Civilization in the Southwest."
April 15—R. L. Moore—"Foundations of Point Set Theory."
April 20—Eugen Kuhnemann—"Goethe and the Modern World."
April 20—Albert C. Seward—"Plant Record of the Rocks."

April 21—Ellery H. Harvey—"The Organization and Function of a Laboratory in a Retail Merchandising Establishment."
April 25—William J. Robbins—"Biological Research in Europe and America."
May 6—Ernst Waldschmidt-Leitz—"Specificity and Mode of Action of Proteolytic Enzymes."
May 10—George Wagner—"Goethe as a Scientist."
May 11—Philo M. Buck—"Goethe and Shelley."
May 12—Alexander Hohlfeld—"Goethe and our Time."
May 20—Richard Courant—"Relations between the Calculus of Probability and Differential Equations."
May 25—A. J. Kluyver—"Metabolism of Microorganisms and Redox Potentials."
May 27—Daniel Mornet—"Quelle Idee les Francais du VXIIIe Siecle se sont-ils faits de l'Amerique."

PART II—GENERAL INFORMATION

HISTORY AND GOVERNMENT

HISTORICAL SKETCH—In the settlement of the pioneer regions of the United States, it very early became the established practice to set apart a share of the unoccupied land for the support of an institution of higher learning. Immigrants were thus assured that the opportunities of an advanced education would not be denied the children of the new community because the founders of it had ventured into the wilderness. This system, conceived in a spirit of statesmanship at once high and prudent, tended to draw an intelligent body of citizens into the region which was being settled, and to set at work forces which would be felt in the permanent elevation of the tone of public education. Thus in 1836, the first year of the territory of Wisconsin, steps toward the establishment of a university were taken by the territorial legislature. In 1839, the National Congress granted to the territory two townships of public land "for the use and support of a university"; and in 1848, when Wisconsin was applying for admission to statehood, provisions for the university were written into the constitution laid before Congress.

The state was admitted May 29, 1848; the necessary legislative acts providing for the organization of the University were approved July 26 of the same year; and the first Board of Regents met at Madison in October. The new state had nothing with which to endow the new institution but the unsettled land already granted to it. The Regents, therefore, had before them the choice of two courses—to sell the lands at low prices in competition with the other wild lands of the state, or to refrain from selling until the increase of population should have raised the value of the university property to a substantial amount. The one course would sacrifice the material endowment; the other would prevent the state from benefitting by the influence of the University in its formative years. The Regents wisely, as the history of the state has proved, determined to open the institution without delay. The financial operations which followed have been severely condemned, but there can be no question that the intelligent bounty of the state legislature has afforded the University a safer and far more generous support than the largest possible endowment that could have been secured by the conservative management of the land of the institution. Moreover, the direct dependence of the University upon the legislature has made it a part of the life of the state in an intimate way, and by making higher education a practical matter for all citizens, has performed a useful service as an element in raising political questions above a merely material plane.

The new institution began instruction in February 1849. It bore the name of a university, but had in operation only a preparatory school of twenty pupils, under the tuition of John W. Sterling, a graduate of Princeton, who bore the title of professor of mathematics. Professor Sterling gave a life of sacrificial devotion to the institution as it added to its academy a little college, and as the little college carried on its struggling and painful life. He was happy enough to live until the University began to assume proportions worthy of its ambitious name. The chancellor, John H. Lathrop, a graduate of Yale, called from the presidency of the University of Missouri, entered upon his duties in the autumn of 1849. He was a man whose plans were genuinely large and at the same time

definite, but which were in the main never realized because of the paucity of funds. He insisted upon maintaining a solid classical course as the nucleus about which all possible future developments were to be gathered but which was never to be sacrificed to any other objects, however plausible they might seem and however much he desired to meet them. Under his administration (1849-1858) the faculty grew to seven members, and some systematic instruction was given in modern languages, English literature, the art of teaching, and agriculture, as well as ancient languages, mathematics, and philosophy. The college was bitterly criticized. There was a feeling abroad, vague but insistent, that the University did not do for the community what it should. A "practical" education was wanted, without any clear idea of what a practical education might be, or how expensive the equipment for it must be. Chancellor Lathrop resigned, and after a few months, during which the well-known educational theorist, Henry Barnard, then in ill health, held the title of chancellor, the administration lapsed into the hands of the faculty, Professor Sterling presiding as vice-chancellor. The dark days of the Civil War followed. The professors lived on half pay. Many of the students took their places in the army, so that in 1864 no commencement exercises were held, only one of the senior class being in residence.

The maintenance of the institution during these days of struggle had its important effect—that a center and tradition were created. The material beginning of the University may fairly be said to be the grant under the Morrill Act (1862) for the support of a college of agriculture and mechanic arts "without excluding other scientific and classical studies." This noble statute bears evidence of the influence of the Civil War in that it made instruction in military tactics a condition of the continuance of the grant. The very smallness of the literary college perhaps made it the more natural to amalgamate the new institutions with the old, and thus give to the University of Wisconsin its peculiar character. In the state all types of highest instruction, whether liberal, professional, or technical are given by the one institution. The University of Wisconsin has accordingly a very great diversity of functions and a very complex organization. In this way unseemly rivalries among institutions of higher learning conducted by the state have been avoided and the conception of instruction within the University has been in some departments liberalized and in others elevated.

The reorganization of the institution after the acceptance of the Morrill grant was carried out under the vigorous presidency of Dr. Paul A. Chadbourne of Williams College (1867-1870). A department of agriculture and a college of law were established in 1868; steps were taken toward the acceptance of women students on an equality with men; and the legislature began, first of all to appropriate moneys to compensate for the impairment of the university fund, later resumed the responsibility of providing necessary buildings, and finally took the step of voting direct taxes for the support of the University. At the same time a system bringing the University into close relations with high schools in the state was organized. The presidency of Dr. John H. Twombly (1871-1874) followed that of Dr. Chadbourne.

The foundation of the University had now been laid, and the policy of including within it a group of technical and professional colleges, as well as a strong college of liberal arts, had been determined upon. During the presidency of Dr. John Bascom (1874-1887), the University was developed into a firmly organized and well equipped teaching institution, was brought into close and orderly relations with other public schools of the state, and was made a moral force in the lives of its students and of the community. Dr. Bascom found the recognition of coeducation halfhearted and ambiguous and made it distinct and complete. He found the income deficient, the buildings, the library, and the

scientific apparatus inadequate, and the faculty too small for the proper division of the departments and the maintenance of high standards. In every point the institution was put on a sound basis. Buildings were erected and satisfactorily equipped, especially for the science departments. The library was enlarged and the faculty became a body of specialists, rather than a group of general teachers. Dr. Bascom more than any other man was responsible for the increase in income which made this progress possible, by the creation of a ratio tax, established in 1876 in the proportion of one-tenth mill to each dollar of the property valuation of the state. The system has been maintained with a few interruptions and with liberal increases ever since. Finally the free high schools, the establishment of which was promoted by the act of 1875, granting state aid to such institutions, were bound to the University by a system of accrediting their graduates on the one hand, and on the other by the recognition of the university degree as a qualification for a certificate to teach in the public schools of the state.

In the administration of Dr. Bascom's successor, Dr. Thomas Chrowder Chamberlin (1887-1892), a graduate of Beloit College, the strong college of Dr. Bascom began to grow into a true university. In all ways graduate work assumed a place as an active part of the institution. Scholars with the ideas of research brought from Johns-Hopkins or from Germany were added to the faculty. The first university fellowships were established. The degree of doctor of philosophy was offered. A reorganization into the Colleges of Letters and Science, Engineering, Agriculture, and Law, effected in 1889, testifies to the growing vigor and more distinctly understood aims of the professional and technical institutions. Intercollegiate debates and athletics and "student activities" began to be heard of, and in brief the tendencies which have resulted in the condition of the present day showed themselves definitely.

During the presidency of Dr. Charles Kendall Adams (1892-1901) these tendencies became dominant. A large armory and gymnasium was built. An athletic field was acquired—Camp Randall, the historic encampment where the Wisconsin troops were concentrated during the Civil War. The University became socially more complex. A dean of women was appointed. A school of music and a choral society were established. In every way the institution developed. The colleges of law and engineering grew rapidly, and had to be provided with new buildings. The fields of political, economic, and social science, and of history were greatly strengthened. The University had become very definitely the recognized culmination of the public instruction of the state, and was resorted to in increasing numbers by graduates of the state normal schools. The institution was cramped for want of room, and though the increases in building and equipment were rapid, they barely kept pace with the enormous growth in the number of students. The crowning achievement of Dr. Adam's administration was the erection on university ground of a building to house, with the university library, the library of the State Historical Society—a reference library of great value, and in some aspects unique. The improvement of the facilities placed at the service of the University by the opening of the library, which took place in 1900, marks an epoch in the history of the institution.

Dr. Adam's health failed in 1900; and from that time to 1903, with but a few weeks of interruption, Dr. Edward Asahel Birge, for many years a member of the faculty and then Dean of the College of Letters and Science was acting president. Throughout the entire period the increase in numbers and the corresponding development of the work of the institution went on uninterruptedly.

Charles Richard Van Hise, professor of geology, was the first alumnus of the University to be called to the presidency, which he assumed in 1903 and occupied until his death on November 19, 1918. The material progress of the

institution continued under his administration. The College of Agriculture became an important college, as well as an institution of research. A course in home economics was created; the first two years of a medical course were given. Courses in journalism, in chemistry, and for the training of teachers were established, while the older similar School of Commerce, now called a course, continued to thrive. Lagging somewhat behind these advances have come the material provisions for them, so that the University remains crowded. The mere enumeration of the newly organized courses illustrates the fact that during the administration of President Van Hise, the tendency of the University to accentuate professional equipment rather than a liberal culture suffered no abatement. At the same time, the work of the department of the humane arts and the pure sciences constituted the largest single part of the activity of the University and the opportunity and the ideal of liberal culture were maintained with energy.

The war made a deep impress upon the life of the University. In such a national crisis an institution of higher learning manifests its ideals mainly through the response of those who have received its training and imbibed its spirit. The University fostered the ability and encouraged the desire of its faculty, alumni, and students to be of directly active use to their country, an ability and a desire which have been abundantly manifested. For the alumni it could do little directly, but it has carefully preserved the record of their service as a memorial to the future. To the members of the faculty called to war work, it granted leave of absence on generous terms. The total number of faculty, alumni, and students in active military service was approximately 10,000 men.

The signing of the armistice did not terminate the University's connection with the war, for many students and not a few of the professors remained in the service in the war zone, or in the army's educational schools, or aided the American Commission in the manifold duties of settling the terms of the Peace of Versailles. In all the labors of war and of the coming peace, President Van Hise was untiringly active, and his death, a few days after the armistice, was in truth another sacrifice which the Great War imposed upon the University.

In January 1919, Edward Asahel Birge, who had been Dean of the College of Letters and Science since 1891, was elected President of the University. The issues which confronted his administration were especially heavy and complicated. They involved numerous scholastic questions and also many difficult financial problems, raised by the phenomenal increase in attendance after the war and by the concurrent increase in the cost of living and building, which came at a time when business of nearly all kinds was beginning to suffer the inevitable check which followed the peace. Partial solutions were found for these problems until a special session of the legislature, in May, 1920, granted the necessary funds for operation and enabled the University to place salaries on a satisfactory basis. Toward the close of President Birge's term and under his inspiration, regents, faculty, legislature, and state had united to ensure the future of the University. Other results of his administration, which helped to initiate the post-war development of the University, were: the securing of a modest but promising annual research fund; the enlargement of the medical course to the full four years; the erection of the Wisconsin General Hospital, which is administered by the Medical School; and the resumption of building operations in the University, made possible by the legislature of 1925.

Glenn Frank, editor of *The Century Magazine,* succeeded Dr. Birge upon the retirement of the latter in 1925.

PLACE IN THE EDUCATIONAL SYSTEM—The University of Wisconsin is the culmination of the free educational system of the state. In the educational policy

of the state, the University is related to the high schools as are the high schools to the primary and grammar schools. It is not expected that all pupils who complete the grammar grade will advance to the high school; nor is it expected that all who complete a high-school course will go forward to the University. But the school system of the state has been so arranged as to make advancement from one step to another as easy and natural as possible. The University encourges in its teachers and advanced students research, including learning, investigation, and the application of scientific knowledge to the arts of life. Its largest work is to disseminate knowledge through the systematic discipline of organized courses to resident students, both in liberal and professional study. In addition, the University, through an extension division organized upon the broadest basis, assists those who for any reason cannot become resident students to enjoy the benefits of its facilities and equipment, with the fewest possible restrictions.

SUPPORT—The University is supported partly by the income of federal grants, partly by taxation of the people of the state, partly by student fees, and to a slight extent by private gifts. There have been several federal grants, namely: The Two-Township Grant of 1848; the Supplementary Two-Township Grant of 1854; the Morrill Grant of 1862; the Supplementary Morrill Grant of 1890, and the Nelson Grant of 1907 for the support of teaching in agriculture and mechanic arts; the Hatch Grant of 1887, the Adams Grant of 1906, and the Purnell Grant of 1925 for the support of agricultural experiment stations; the Smith-Lever Grants of 1914 and 1924, and the Capper-Ketcham Grant of 1928 for the support of extension work in agriculture and home economics.

In addition to numerous and large appropriations for buildings and other scientific purposes, the state of Wisconsin has made a number of continuing grants. The first was the one-tenth mill tax of 1876. The principle of this tax was once temporarily abandoned, but has been recurred to by the legislature, the present ratio being three-eights of a mill on the dollar.

The more important gifts that have come to the University are from Dane County for the purchase of lands for the University farm; from the late Governor C. C. Washburn for the founding of Washburn Observatory; from the late Judge Mortimer M. Jackson for the establishment of the Mortimer M. Jackson professorship of law; from the late Dr. C. K. Adams and Mrs. Adams for the foundation of fellowships; from the late Mrs. Fannie P. Lewis for the foundation of scholarships for women; from the late Anna Marston for the establishment of the Anna Marston Fellowship; from the late Calvin K. Jayne, the residue of whose estate is to be used as a loan fund for agricultural students, or for fellowships in the event that the money is not required for loans; and from Horace S. Oakley, Mrs. Mary Oakley Hawley, and George Walter Oakley, a fund in honor of their mother to be known as the Jane Oakley fund, the income to be used to pay the annual contributions of the University of Wisconsin to the American School of Classical Studies at Athens, Greece.

On August 27, 1908, the entire estate of Colonel William F. Vilas was bequeathed to the University, the income, however, (part, or whole if need be) to go to his wife and daughter during their lives. Half of the income of the estate is to be used for the support of research professorships, fellowships, and scholarships, and the remainder to increase the principal. The residue of the estate of the late Torger Thompson is bequeathed to the University to establish a chair in the Scandinavian languages and to assist Scandinavian students attending the University; the will also provides for a trust fund of $10,000, the income to be paid annually to the Regents for research in clinical medicine. In 1911 the friends of the University created the Carl Schurz Memorial Foundation

with a fund of $30,000 given in trust to the Regents of the University. The unused income from this fund has been transferred to the principal from time to time so that the fund now amounts to $48,000.

The late J. Stephens Tripp, of Prairie du Sac, made the University residuary legatee of his estate of approximately $500,000, free from limitations and restrictions of any kind, which marks it as a remarkable expresssion of confidence in the permanent administration of a great public educational trust. $300,000 of the principal and accumulated income was used to aid in the construction of Tripp Hall, one of the dormitories for men. It is expected that this sum will be returned to the J. Stephens Tripp Fund when the other indebtedness on the dormitories has been amortized. $200,000 was used to aid in the construction of the Memorial Union Building and Tripp Commons. $10,000 was put in the permanent University Trust Funds, the income to be used for a scholarship for students from Sauk County. The remainder is to be used for the acquisition of land for the development of an arboretum in the vicinity of Lake Wingra, already undertaken by the Madison Parks Foundation. The will of the late Mary J. Eichelberger, of Horicon, provided $20,000 for the University; like that of Mr. Tripp, this bequest is free from limitations and restrictions.

The will of the late John M. Olin of Madison provided for the gift to the Regents, in memory of his wife, Helen Remington Olin, of his beautiful home at 130 North Prospect Avenue, and eight lots, to be used as the residence of the president of the University. The premises are now occupied by President Frank and his family.

The will of the late Thomas Evans Brittingham of Madison provided for a "University of Wisconsin Trust Fund," the amount of which has not been reported to the Regents. The trustees are to distribute annually, or from time to time, so much of the net income as they may deem proper to individuals, colleges, or departments of the University. The funds released have been sufficient to maintain the Brittingham Professorship of Philosophy during the past three years.

The will of the late William H. Kipp, of Reedsburg, provides for a permanent trust fund, the amount of which has not yet been determined. The income is to be used for scholarships of $1,000 per year for students from Wisconsin high schools; the first one is to be awarded to a student from Adams County, and thereafter (as rapidly as funds become available) to students from other counties in alphabetical order.

GOVERNMENT—The government of the University is vested in the Regents, who possess all the powers necessary to accomplish the objects of its establishment and to perform the various duties prescribed by law. The Regents, appointed by the Governor of the state, include one member from each of the eleven congressional districts, and four from the state-at-large, of whom two are farmers and two are from the manual trades. At least two of the members are women, and the President of the University and the Superintendent of Public Instruction are *ex-officio* members. The Regents appoint all administrative officers and faculty members, and all faculty rules regarding the government of students are subject to their approval.

The university faculty exercises authority, subject to the approval of the Regents, in all matters relating to educational policy, scholastic standards, and, in general, the relation of students to the University. All members of the staff of instruction with the rank of assistant professor or above constitute the governing faculty; other members of the staff of instruction have a voice but no vote at all meetings of the university faculty, with the exception of executive sessions. The faculty of each college, school, or division is similarly organized for the purpose of administering matters relating solely to its own unit of organization.

PUBLICATIONS OF THE UNIVERSITY

The University of Wisconsin Studies are published quarterly at Madison and contain original papers by persons connected with the University. More detailed information regarding these and other publications may be obtained on application to the University Editor.

The general series of the Bulletin of the University of Wisconsin includes the annual announcements of courses, both general and special. Copies of the special announcements of the various schools and colleges may be obtained upon application to the University Editor; the complete announcement is reserved for institutional distribution and so is not available to prospective students. The University Directory, containing names, classifications, and addresses of students and staff members, is published annually in November; copies are mailed by the Information Office upon receipt of fifty cents in stamps.

The high-school series, comprising a number of manuals designed to assist secondary school teachers in the subjects of the high-school curriculum, is published by the Committee on High-School Relations.

From the Washburn Observatory are issued the Publications of Washburn Observatory; from the Agricultural Experiment Station, bulletins and annual reports; and from the office of the Farmers' Institute, the Wisconsin Farmers' Institute Bulletin.

THE CAMPUS

By the provisions of the Constitution of the state of Wisconsin, the University must be located at or near the state capitol, afterwards fixed at the "village of Madison." The founders of Madison intelligently adapted the original plan of the city of Washington to local conditions, selecting an eminence in the center of the city for the site of the capitol, and laying out radial thoroughfares approaching it so that it closes the vista from every direction. A mile to the west, at the end of one of these radial streets, on a second elevation rising abruptly to a height of more than a hundred feet above the shore of Lake Mendota, the principal building of the University was erected, thus closing the view from the capitol in that direction.

The earliest buildings to be erected on the campus were North and South Halls (1851, 1855), which contained for some years not only all the classrooms and offices of the University, but also the living quarters of both faculty and students. These twin buildings, remodeled in recent years, now house the departments of mathematics, journalism, and political science, and several administrative offices. Rapid increase in enrollment soon resulted in the erection of University Hall (1857), since renamed Bascom Hall, which at once became and has always remained the center of the University. This building, originally constructed in the simple and dignified modification of classical renaissance architecture accepted in America since colonial times, has been twice added to (1900, 1906), and has recently (1927) undergone further enlargement in conformity with farsighted plans for symmetrical expansion. In Bascom Hall are located the principal educational administrative offices of the University and the classrooms and offices of several of the more important departments of instruction in liberal arts subjects.

From Bascom Hall a broad open plaza bordered by elms—the upper campus—sweeps downward in the direction of the capitol. Along one side are North Hall, the Engineering Building (1901, 1910), and Science Hall (1888), back of which, near the lake shore, may be found a number of the special buildings of the College of Engineering; on the opposite side are situated the Biology Building (1910), South Hall, the Law Building (1893), and Music Hall (1879), flanked by the group of women's buildings, including the two dormitories, Chadbourne Hall (1871) and Barnard Hall (1912), and the gymnasium, Lathrop Hall (1909). Back of Bascom Hall, at the base of the hill, are the Chemistry Building (1905, 1912, 1928) and Sterling Hall (1916), in which are housed the departments of physics, economics, and sociology.

The lower campus, a flat area encroaching upon the old residential district of the city, is still in an early stage of development. Here, at the lake's edge, stands the combined men's gymnasium and armory (1894) adjacent to which are the boat houses and an open field used for a parade ground and for certain types of athletic exercises. Close by is situated the most stately of all the buildings on the campus, the Library (1900, 1912), an edifice of Bedford limestone with a colonnade and terrace of great beauty and dignity. In a grove of oaks and elms toward the lake from the library stands the Memorial Union Building (1928), "erected and dedicated to the memory of the men and women of the University of Wisconsin who served in our country's wars." Among the features of this building are a large refectory, several dining rooms, recreation rooms, quarters for student publications and other undergraduate activities, and lodgings for transient alumni. The Y. M. C. A. dormitory, the University Club Building, and the Administration Building, headquarters of the business organization of the University, are also located in the lower campus district.

Westward from the main group of buildings are situated the University Extension and Home Economics Building (1912), Washburn Observatory (1878), the medical group, the Wisconsin High School (1913), and, extending for some distance beyond these, the numerous buildings and experimental plots of the College of Agriculture, including barns, greenhouses, and a large judging pavilion (1908) containing an oval amphitheater with a seating capacity of two thousand. The medical group consists at present of the Wisconsin General Hospital (1924), the Service Memorial Institutes Building (1928), the Bradley Memorial Hospital (1918), the Infirmary (1918, 1931), the Nurses' Dormitory (1925), and the Orthopedic Hospital for Children (1931). On the lake shore back of the principal agricultural buildings is a group of men's dormitories, Adams Hall, Tripp Hall, and the Refectory (1926), near which are located the intramural athletic fields for men.

South of the agricultural campus lies the forty-two acre tract known as Camp Randall, the north portion of which has been set aside as the new site for the College of Engineering; the present buildings include the old Forest Products Laboratory (1909) and the Mechanical Engineering Building (1920, 1931). The south part of the area is dominated by the Men's Field House (1930) and a large concrete stadium, with adjacent playing fields for men. Memorial Park, the women's field house and playing fields, tennis courts, and storehouses occupy the rest of the Camp Randall area.

A new Forest Products Laboratory is now under construction by the Federal Government on a tract of land some distance to the west of the dairy barns of the College of Agriculture; upon completion of this new building, the present laboratory and the old wing of the Soils Building will be available to the University for much needed expansion.

Spread for nearly a mile along the crest and on the slopes of an irregular ridge, bordering the southern shore of the largest of Madison's four lakes, the grounds of the University are of marked natural beauty and afford many rare views out over the broad expanses of water, farm lands, and city dwellings. Of special attraction are the many choice groups of evergreens, the rows of towering elms, and the willow drive fringing the lake-shore. The lake itself provides unexcelled facilities for swimming, boating of all sorts, and, during the late winter, skating, while the hills make possible two other forms of winter sports not everywhere common, skiing and tobogganing.

The grounds have a special archaeological interest because of the presence of several Indian effigy mounds which are found in abundance in and near Madison. These are small mounds of earth in the form of animal and other totems, made by the Winnebago and allied native tribes in prehistoric periods, unique in being found only in southern Wisconsin and along the boundaries of the states to the west and south.

LIBRARIES

The libraries at Madison, all of which are at the service of members of the University, are six in number, viz., the Library of the University of Wisconsin, the Library of the Historical Society of Wisconsin, the Library of the Wisconsin Academy of Sciences, Arts, and Letters, the State Law Library, the Legislative Reference Library, and the Madison Free Library. These libraries duplicate books only to supply exceptional demands, and have an effective strength approximately equal to the whole number of volumes possessed by them. The total number of bound volumes in all the libraries is about 899,000 and the number of pamphlets exceeds 422,000.

The first three libraries above named are housed on the university campus in the library building of the State Historical Society. In the south half of the first floor are located three department libraries of the Historical Society, viz., documents, newspaper files, and maps and manuscripts. In the north end of this floor is a series of six seminary rooms, allotted to American history, European history, economics, political science, and mathematics. The greater part of the second or main floor is occupied by the general reading room and the periodical room, which are used in common by the two libraries. In open cases in the reading rooms are shelved several thousand general reading, reference, and reserved books. To these, as well as to the large collection of general periodicals in the periodical room, all readers have direct access. The main portions of both libraries are stored in the stack wings adjoining the delivery room on the west. University staff members have direct access to the shelves in all parts of the library, and students engaged in advanced work, upon recommendation of their instructors, are allowed access to those parts of the collection dealing with their special subjects.

The administrative rooms of the Historical Society and of the University Library are situated at the south and north ends of the second floor respectively. The north end of the third floor is occupied by six seminary rooms for the subjects of philosophy and education, classics, and modern languages and English. The museum and gallery of the Historical Society occupy the fourth floor. During the academic year, the library is open fourteen and one-quarter hours daily, except on Sundays and legal holidays.

A large reserved book reading room in the basement of Bascom Hall is open at the same hours as the Library during the academic year. The agricultural, engineering, law, medical, astronomical, biological, chemical, and geological libraries are located in their respective buildings.

The Library of the University of Wisconsin, including its branches, contains about 436,500 volumes and 70,000 pamphlets. The catalog is the usual dictionary card catalog of authors, subjects, and titles in one alphabetical arrangement. Subject to certain restrictions, books may be drawn by all members of the University. Every student of the University, matriculated for the regular year, is required to make a library deposit of $2.00. This deposit, less charges for fines and damages, is returnable to the student by the cashier upon graduation or earlier withdrawal from the University.

The Library of the State Historical Society contains 274,000 volumes and 292,000 pamphlets. While strong in all fields of American history and allied subjects, it is especially rich in manuscript and other material for the study of the history of the Mississippi valley. Its collections in English history are among the most extensive in this country.

The Library of the Wisconsin Academy of Sciences, Arts, and Letters, comprising about 5,000 volumes, is a valuable collection of reports and transactions of learned societies. It is located in the library building and constitutes a useful supplement to the other libraries in this special field.

The Legislative Reference Library in the Capitol numbers 60,000 volumes, pamphlets, and collections of clippings. This library collects information on all subjects of legislation, but the material is chiefly in the field of political science and economics. The State Law Library, also in the Capitol, numbers about 90,000 volumes. Students are allowed to draw books from the Madison Free Library, a collection of 93,000 volumes.

GENERAL ACADEMIC REQUIREMENTS

ADVISERS. Upon being admitted to the University, each student is assigned to a member of the faculty, who acts as his adviser. The duties of the adviser are to assist the student in selecting his subjects so as to secure a well-rounded education, as well as to aid him in interpreting the requirements and to oblige him to meet them in their proper sequence. The responsibility for the selection of courses rests, in the final analysis, upon the student and it is not the province of the advisor to refuse approval of a course which the student is entitled to elect. Similarily, it is the primary duty of the student to meet the requirements of his course in their proper order, so that he may not, in his senior year, find himself ineligible for graduation. At the opening of each semester the student is required to consult his adviser concerning his choice of studies, and the adviser must approve the student's elections before he is permitted to enter classes.

EXAMINATIONS. Each subject terminates in a two-hour written final examination at the close of the semester; these final examinations are regularly scheduled, and the times set may not be changed without special faculty authorization. Duding the semester two or three one-hour written tests are ordinarily held in all but the most advanced courses. There are no exemeptions from examinations because of high standings in class work.

CREDITS. The unit used in computing the amount of work required for graduation is the credit, which represents one hour of class work per week for one semester, together with the necessary preparation. Two or sometimes three hours of laboratory work are considered as the equivalent of one hour of class work.

GRADES AND POINTS. Semester grades are reported by letter only, although they are commonly based on averages of numerical grades in final examinations and other written work. The characterization of letter grades by plus and minus signs is not authorized. For the sake of convenience in computing weighted averages, each letter grade carries a specified number of points per credit; thus, a B in a three-credit subject would yield 6 points. The scale of grades and points follows:

GRADE	PERCENTAGE EQUIVALENT	POINTS PER CREDIT
A (Excellent)	93-100	3
B (Good)	85- 92	2
C (Fair)	77- 84	1
D (Poor)	70- 76	0
E (Condition)		0 (—½)*
F (Failure)	Below 70	0 (—1)*

POINT-CREDIT RATIO. The general quality of a sudent's work over a number of semesters is expressed in terms of a point-credit ratio, which is the result obtained by dividing the total number of points he has earned by the total number of credits *earned*. The highest possible quotient is 3.0, which represents a grade of A in every subject; the lowest possible quotient is zero.

The point-credit ratio must not be confused with a similar figure known as the grade-point average; this is computed at the close of each semester and is based solely on the number of points earned and credits *elected* during that semester, with deductions for deficiencies (see * above). The maximum average is 3.0, the minimum -1.0.

ATTENDANCE. Students are required to be present at the opening of the semester and to remain until the work of the semester is finished. It is expected that every student will be present at all of the classes at which he is due. If at any time a student is absent, he must satisfy his instructors that such absence is for good and sufficient cause. Any student who is absent from recitations immediately preceding or following Thanksgiving day or the Christmas or spring recess without an excuse acceptable to the dean of his college will be excluded from the semester examinations in those subjects from which he was absent and will be required to write special examinations during the following semester. This rule also applies to absences at the opening of the second semester.

AUDITORS. Regular students may enter classes as auditors, subject to the approval of the adviser and of the instructor whose class is visited. Auditors are under no obligations of regular attendance, preparation, recitation, or examination, and receive no credit toward graduation. Others may be admitted as auditors only with the consent of the dean; they are required to register, pay the regular fees, and to have class cards for the courses they elect to attend.

COURSES AND DEGREES

TITLES

GRADUATE IN AGRICULTURE—Two-Year Course in Agriculture
GRADUATE NURSE—Three-and Five-Year Nursing Courses
JUNIOR GRADUATE IN LIBERAL STUDIES—Completion of sophomore year in College of Letters and Science

FIRST DEGREES

BACHELOR OF ARTS—Granted in General Course and Course in Commerce
BACHELOR OF ARTS (Humanities)
BACHELOR OF ARTS (Journalism)

BACHELOR OF LAWS

BACHELOR OF MUSIC

BACHELOR OF PHILOSOPHY—Granted in General Course and Course in Commerce
BACHELOR OF PHILOSOPHY (Normal Course)—discontinued in 1932

BACHELOR OF SCIENCE (Agriculture)—Four-Year Course
BACHELOR OF SCIENCE (Agriculture and Education)
BACHELOR OF SCIENCE (Art Education)
BACHELOR OF SCIENCE (Chemistry)
BACHELOR OF SCIENCE (Chemistry-Commerce)—discontinued in 1932
BACHELOR OF SCIENCE (Chemical Engineering)
BACHELOR OF SCIENCE (Civil Engineering)
BACHELOR OF SCIENCE (Education)
BACHELOR OF SCIENCE (Electrical Engineering)
BACHELOR OF SCIENCE (Home Economics)
BACHELOR OF SCIENCE (Home Economics and Education)
BACHELOR OF SCIENCE (Hygiene)—Five-year Nursing Course
BACHELOR OF SCIENCE (Industrial Education)—not granted after February 1933
BACHELOR OF SCIENCE (Mechanical Engineering)
BACHELOR OF SCIENCE (Medical Science)
BACHELOR OF SCIENCE (Metallurgical Engineering)
BACHELOR OF SCIENCE (Mining Engineering)
BACHELOR OF SCIENCE (Pharmacy)—Four-Year Course
BACHELOR OF SCIENCE (Physical Education)

GRADUATE IN PHARMACY—not granted after 1934

A graduate of any course may receive the baccalaureate degree of any other course by completing the additional studies required in that course. Two baccalaureate degrees cannot be taken in one year, and for a second bachelor's degree in the College of Letters and Science there are required one year's additional study and a special thesis.

HIGHER DEGREES

The University confers in course, the degrees of Doctor of Philosopny, Doctor of Medicine, and Doctor of Public Health. The degree of Master of Arts is conferred as a second degree upon candidates who have received the degree of Bachelor of Arts or an equivalent, and the degree of Master of Science upon candidates who have received the corresponding baccalaureate degree. Special Master of Arts degrees in Commerce and in Jounrnalism are also conferred. The degree of Master of Public Health is granted in course to graduates of approved medical colleges for graduate work done here. The degree of Master of Philosophy is conferred upon candidates who have received the degree of Bachelor of Philosophy at the University of Wisconsin; such candidates may receive the degree of Master of Arts or Master of Science by doing supplementary work. Candidates who have taken the degree of Bachelor of Science in one of the engineering courses may receive the degree of Master of Science in the appropriate branch, or the degree of Civil Engineer, Mechanical Engineer, etc. For conditions under which these higher degrees are granted, see "Graduate School."

HONORS AND PRIZES

Sophomore Honors. Sophomore honors and high honors are awarded on the basis of a minimum of two full years' work, not less than 60 credits, completed in residence at the University. A student earning during these two years 135 grade-points, plus 1½ grade-points for each credit above 60 required in his course, will be awarded Sophomore Honors; a student earning during these two years 165 grade-points, plus 2 grade-points for each credit above 60 required in his course, will be awarded Sophomore High Honors.

Senior Honors. Senior honors and high honors are awarded on the basis of the academic requirements for the second half of any four-year course. A student earning 135 grade-points, plus 1½ grade-points for each credit above 60 required in his course for completing the second half, will be awarded Senior Honors; a student earning 165 grade-points, plus 2 grade-points for each credit above 60 required in his course for completing the second half, will be awarded Senior High Honors. Any student who has been permitted to carry more than the minimum number of credits during the first two years of his course and less than the minimum during the last two years, will not thereby be barred from securing senior honors.

Thesis Honors. Senior thesis honors are awarded at commencement to students who have written exceptionally fine or original theses, without reference to their other work.

Bryan Prize Fund. In 1899 William Jennings Bryan presented $250 to the University, the income to be used as a prize for the best essay on *The Science of Government*. Unused income has been added annually to the principal, which now amounts to $650. The prize was awarded to Gordon Sinykin in 1931.

Salmon W. Dalberg Prize. A gift of $1000 was received from Mrs. Julia Dalberg Bower and Miss Frieda Dalberg, to establish a trust fund in memory of their brother, Salmon W. Dalberg, deceased. The income is assigned each year to an honor student in the graduating class of the Law School.

Edna Kerngood Glicksman Prize. "This prize, perpetuating the memory and influence of Edna Kerngood Glicksman and awarded each year to a member of the senior class in recognition of intellectual attainments, high womanhood,

and service in the college community," was awarded in 1931 to Miss Marjorie J. Carr.

THE THEODORE HERFURTH EFFICIENCY PRIZE. Mr. Theodore Herfurth, of Madison, has offered a prize of $100 to a senior male student who shows greatest evidence of initative and efficiency. In 1931 the award went to Frederick S. Crawshaw.

JUBILEE MEDAL. The award of this medal, a reproduction in gold of the medal designed for the University at the time of its fiftieth anniversary, was established by the cooperation of the Departments of Economics, History, and Political Science in recognition of the best senior thesis in those three departments, and is awarded annually at commencement. The Departments of Philosophy and Sociology are now included in the competition. Jacob H. Beuscher received the medal in 1931.

LEWIS PRIZE. In 1865, Governor James T. Lewis gave $100 and in 1866 another $100 to constitute a fund the income of which was to purchase an annual scholarship medal. In 1873, with the consent of the donor, it was decided to use the income as a prize for the best undergraduate essay. By 1905 the fund had grown to over $300 and the Regents in recognition of this having been the first permanent endowment given to the University, established the "Lewis Prize," consisting of $25 annually. Any deficiency in the income of the fund, which now amounts to about $700, is to be paid from the general account of the University. The prize is awarded to that member of the freshman class taking full work and regularly enrolled in freshman English who shall write the best theme. under conditions determined by a committee of the instructors in English 1. The prize for 1931 was awarded to Sidney B. Berenner.

MITCHELL MEDAL. In June, 1921, Mr. William M. Chester of Milwaukee offered a gold medal in memory of John Lendrum Mitchell, a member of the Class of 1917 who lost his life while serving as an aviator in the American Expeditionary Force in the World War, the medal to be awarded annually for the best essay on industrial relations. The medal for 1931 was awarded to Bruce A. Green.

WILLIAM F. VILAS MEDAL AND PRIZE FUND. In 1910-11 and again in 1911-12, Anna M. Vilas gave $125 for medals for intercollegiate debating and oratory. In June, 1912, to make this annual gift permanent, she turned over $4,000 to the Central Wisconsin Trust Company of Madison, the annual income to be used as follows: First: $125 for seven medals in oratory, to be known as the William F. Vilas Medals for Oratory. The Department of Speech has charge of the administration of these prizes. Second: Two cash prizes for essays—one of $50 and one of $25 to be known as the William F. Vilas Prizes for Essays. The English Department annually posts on various bulletin boards the conditions of competition. The prizes for 1931 were awarded to F. Hoyt Trowbridge and Maurice F. Neufeld, and the medals to Miss Ruth K. Batterman, Charles H. Jagow, Miss Elizabeth Kyle, Aaron Levine, Jacob J. Muchin, Miss Alice H. Peterson, Aaron L. Tietelbaum.

WESTERN INTERCOLLEGIATE MEDAL. This award is made annually in each institution belonging to the Western Intercollegiate Conference Athletic Association, to the senior in that institution whose scholastic and athletic ability is outstanding. At Wisconsin the winner is selected by the Athletic Council upon nomination of the Athletic Board. In 1931 the recipient of the honor was Louis E. Oberdeck.

STUDENT EXPENSE

UNIVERSITY CHARGES

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

TUITION. No tuition is charged to residents of Wisconsin, except in the Library School ($25 per semester for residents and $50 for non-residents), and the Wisconsin High School ($8 per quarter for residents and $15 for non-residents); a fee of $100 per semester is charged to students who are non-residents of this state, as defined in the following excerpt from Section 36.16 of the Wisconsin Statutes:

"Any student who shall have been a resident of the state for one year next preceding his first admission to the University, or any minor student whose parents have been *bona fide* residents of the state for one year next preceding the beginning of any semester for which such student enters the University, shall, while he continues a resident of the state, be entitled to exemption from fees for non-resident tuition, but not from tuition, incidental, or other fees in the University. Any student who shall not have been a resident of the state for one year next preceding his first admission to the University, except as above provided, shall not be exempt from the payment of the non-resident tuition fees until he shall have attended the University for four academic years but if he shall have attended the University and thereafter shall continuously have been a resident of this state for a period of combined attendance at the University and subsequent residence in the state of not less than four years, he shall, while he continues a resident of the state, be entitled to exemption from payment of the non-resident tuition fee upon reentering the University."

FEES AND DEPOSITS. Each student is required to pay a general fee of $21.50 per semester, covering incidentals, infirmary service, and Memorial Union membership. Students who are paid-up life members of the Memorial Union are entitled to a deduction of five dollars from the general fee. See Summer Session and College of Agriculture for special fees charged in these divisions. The laboratory fees and deposits charged in the various subjects are stated in the announcements of the departments of instruction. A library deposit of $2.00 is required of each student when he first matriculates. Fees are not refundable, except as specified below under Refunds; deposits cover loss of or damage to equipment and are refundable in whole or in part.

PAYMENT. All fees must be paid at the beginning of each semester. Until this has been done, the student will not be considered regularly matriculated and cards entitling him to admission to classes will not be issued. A fine of three dollars ($3.00) is charged for late registration, applicable to all students paying fees after regular registration days, with no exemptions for any reason. The cashier is required not to accept fees from any student who does not pay promptly after his registration card is issued.

Students entering after half a semester or term has elapsed shall pay half of the prescribed fees, excepting that graduate students who enter on May 15 or later may register on the pre-summer session basis, paying the prescribed infirmary and Union fee and the regular weekly rate.

REFUNDS. The cashier, upon recommendation of the Registrar, is authorized to make partial refunds of semester tuition and fees on the following basis to students withdrawing from the University: withdrawal within two weeks from the first day of instruction, 80% refund; within four weeks, 60%; within six weeks, 40%; within eight weeks, 20%; after eight weeks, no refund. Students entering after regular registration days and withdrawing within eight weeks from the first class day will, upon recommendation of the Registrar, be allowed refunds according to the above schedule based on the time actually in residence.

The full amount of fees paid will be returned to students who for any reason fail of admission to the University. No claim for remission of fees will be considered unless such claim be presented during the fiscal year to which the claim is applicable. No fees are refunded in case a student is suspended for disciplinary reasons.

GRADUATE STUDENTS. In general, graduate students are required during the regular year to pay the same fees as are undergraduates, with the following exceptions: (a) instructors, graduate assistants, and regular graduate fellows and scholars are exempt from the non-resident tuition fee only; (b) honorary fellows and scholars are exempt from the non-resident tuition fee and from that part of the general fee known as the incidental fee ($12.00).

The following classes of graduate students who are candidates for higher degrees shall be entitled to exemption from the non-resident tuition fee but shall pay such other fees as may be required of graduate students who hold no offical appointment: members of the teaching and research staffs of the University, graduate fellows, graduate scholars, members of the State Geological and Natural History Survey, members of the technical staff of the Forest Products Laboratory, staff members of the United States Department of Agriculture stationed at the University and engaged in research, technical experts employed in any department of the state government, and officers of the United Sates Army detailed as students by proper authority. However, when any such person shall have paid to the University as a graduate student seven semester or summer session fees, he shall be exempt from further payment of the incidental fee but not of the infirmary or Union fees, in both the regular and the summer sessions, *as long as he shall continue to hold such official appointment.* In the administration of this rule, one but only one, nine-week summer session fee or its equivalent may be counted as two of the seven fees above mentioned; also the full amount of any prescribed fee shall be charged.

Graduate students who are not residents of the state and who are not members of the University staff of instruction or research, and who in any semester pursue studies in amount less than half the normal amount, may have their fees prorated in proportion to the amount of such study upon obtaining the recommendation of the Dean of the Graduate School to the Registrar that the case comes under this rule and that he regards it as one of more than common merit. However, the prorated fee shall not be less in amount than the general fee for the semester.

SELF-SUPPORT

The University Student Employment Office is maintained to assist in finding employment for those men and women students who are partly or wholly self-supporting during their attendance at the University.

Students who have good health, reasonable ability, and a real desire for a college education can make part or all of their expenses by saving what can be

earned during the summer vacation and by working part-time during the school year. Students should realize that to do this requires hard work, the sacrifice of some good times, constant application to studies, responsibility in whatever outside work they undertake, close attention to physical fitness, and careful management of funds. Many working students carry a reduced schedule of classes; the number of credits depends upon the ability of the student and the number of hours of outside work.

Students coming to the University for the first time should have enough to pay all necessary expenses for at least the first semester ($225 to $250), exclusive of tuition fees, clothing, and traveling expenses, so that they may have time to get well started with studies and to find the work best suited to their needs and abilities. Students who have been unsuccessful in obtaining employment and who have no reserve to carry them through the second semester, should not assume that the University will be prepared to finance them.

It is not practicable to make definite arrangements for a position before coming to Madison. In the first place, the employer usually requires a personal interview; in the second place, changes may occur in the plans of either student or employer, so that arrangements made in advance often do not materialize and disappointment results. Neither is it a good plan to come a long while in advance with the idea of finding work, as most employers do not know their needs definitely until a week or ten days before the opening of the school.

As several hundred students apply for work at the opening of the school year, competition is keen. It is impossible to place all of the applicants at once, and often many must wait several days or weeks before finding suitable employment. The office is principally called upon to furnish stenographers, typists, students with technical skill, clerks, waiters and waitresses, dishwashers, janitors, choremen, and houseworkers in private families in exchange for room and board. As far as possible, applications for employment are filled in order; but as the kinds of work available are of a widely varied nature, those students who are best qualified for the work must, in fairness to the employer, be considered first.

Students who desire further information in regard to self-support may write to the University Student Employment Office, 772 Langdon Street, Madison.

SUMMARY OF EXPENSES

Although it is difficult to give a definite set of figures which would be applicable to the "average" student, the following table may suggest the expenses which various classes of individuals might incur during a single academic year, exclusive of clothing, transportation to and from Madison, and non-resident tuition fee.

	Lowest	Average	Highest
Board	$ 180	$ 240	$ 300
Laundry (*if mailed home)	10*	50	75
Sundry personal expenses	50	150	300
Room rent—			
Men's dormitories	110	140	180
Women's dormitories	130	160	160
Double room, per person	90	125	200
Single room	150	175	250
Fees, textbooks, etc.	65	125	200
	$ 395	$ 725	$1125

LOAN FUNDS AND UNDERGRADUATE SCHOLARSHIPS

Information relative to loan funds and scholarships may be obtained from the Chairman of the Committee on Loans and Scholarships, except as specifically noted in the following paragraphs.

SCHOLARSHIPS

LEGISLATIVE SCHOLARSHIPS—Section 36.16 of the Wisconsin Statutes provides that: "The Regents of the University may remit non-resident tuition either in whole or in part, but not other fees, to a number of needy and worthy non-resident students, not exceeding 8 per cent of the number of non-resident students registered in the preceding year, upon the basis of merit, to be shown by suitable tests, examinations, or scholastic records, and continued high standards of scholastic attainment." These scholarships are available for graduates as well as undergraduates; see under the heading Graduate School. The total number of these scholarships is about 235.

AMERICAN ASSOCIATION OF UNIVERSITY WOMEN SCHOLARSHIPS—In May, 1917, the Madison branch of the American Association of University Women made available a scholarship of $100 for a university girl, preferably one who has finished her junior year. In 1922 the amount was increased to $200 to provide two scholarships.

AMELIA E. H. DOYON SCHOLARSHIPS—The will of Mrs. Amelia E. H. Doyon, late of Madison, provided for a gift to the University of $5,000 to be known as the Amelia E. H. Doyon Student Aid Fund. The income from this fund is divided into two equal parts, designated as the Amelia E. H. Doyon Scholarships, which are to be given to young women in attendance at the University, to be selected by the faculty. In making this selection the scholarship or standing of the persons selected and their need of financial help are both taken into consideration. Neither scholarship is to be bestowed on any young woman who has not been in attendance as a student of the University of Wisconsin for at least one year.

WILLIAM J. FISK SCHOLARSHIP. By the will of the late William J. Fisk, of Green Bay, the sum of $6,000 was bequeathed to the University, with the provision that the income be awarded annually to one or more needy and worthy students.

GAMMA PHI BETA SCHOLARSHIP—The Gamma Phi Beta sorority, in 1911, established an annual scholarship of $100 for women students, to be awarded on the basis of scholarship and need of financial assistance.

GEORGE I. HAIGHT SCHOLARSHIP—In June, 1930, the Class of 1899 voted to establish a $500 scholarship in honor of one of its distinguished members. The award is to be made annually to some Wisconsin man in need of financial assistance, preferably an upperclassman who has shown outstanding forensic ability.

KAPPA KAPPA GAMMA SCHOLARSHIP—An annual scholarship of $150 is provided by the Kappa Kappa Gamma sorority for the assistance of needy and meritorious women students.

KOHLER FAMILY SCHOLARSHIPS—In June, 1927, a gift of $20,000 was received from the Kohler family, of Kohler, Wisconsin, to endow two annual scholarships to be known as the Kohler Family Scholarship for Girls and the Kohler Family Scholarship for Boys. The scholarships are created to encourage attendance at the University by deserving graduates of the public high school of the village of Kohler whose intention it is to complete a four-year course.

FANNIE P. LEWIS SCHOLARSHIP FUND—By the will of the late Fannie P. Lewis, of Watertown, Wisconsin, $10,000 was left to be held in trust by the University Regents. The annual income from this money is to be divided equally between two women students of the University who shall be selected by the Regents, on the recommendation of the faculty. In making these recommendations both scholarship and need of financial assistance are to be considered.

LAVERNE NOYES SCHOLARSHIPS—The Trustees of the LaVerne Noyes Estate offer a limited number of scholarships to the University, equal in amount to the tuition plus laboratory fees, to students who have participated in the Great War, or to the children of men who have. Applications should be made at the beginning of the academic year to the Chairman of the Committee on Loans and Undergraduate Scholarships.

OMICRON NU SCHOLARSHIP—Omicron Nu, an honorary organization of home economics students established in 1919, provides a scholarship of $250 annually for a woman in the Home Economics Department of junior, senior, or graduate rank.

HARLAN B. ROGERS ATHLETIC SCHOLARSHIP—The will of the late Viola J. Rogers, of Portage, included a bequest to the University of $5,000 to establish the Harlan B. Rogers Athletic Scholarship, the income to be used each year as provided in the will. The first award was made during the year 1929-30.

SOUTH AMERICAN SCHOLARSHIPS—The Regents have made available to South American students three scholarships of $224 each. For information address the Secretary of the Regents.

CHRISTIAN R. STEIN STUDENT AID FUND—By the will of the late Christian R. Stein, of Madison, a bequest of $1,000 was made to the University, the interest on which maintains a scholarship to be given by the faculty to a student of the University who has been in attendance at least one year.

J. STEPHENS TRIPP SCHOLARSHIP—In April, 1923, the Regents placed $10,000 of the money received from the Tripp Estate in a separate fund in the University Trust Funds to establish the J. Stephens Tripp Scholarship, the income each year to be paid to a student, graduate or undergraduate, from Sauk County, Wisconsin.

MARTHA GUNHILD WEEK SCHOLARSHIP—In December, 1923, the University received $5,000 from the estate of Martha Gunhild Week, of Stevens Point, to establish the Martha Gunhild Week Scholarship. The income each year is to be awarded to a woman undergraduate in chemistry, the candidate to be named and recommended to the Regents by the faculty of the Chemistry Department.

WOMEN'S ATHLETIC ASSOCIATION SCHOLARSHIP—The Women's Athletic Association has established a scholarship in the amount of $100 per annum, which is awarded to an undergraduate woman.

LOAN FUNDS

The loans made by the University of Wisconsin are for emergency purposes only, inasmuch as the funds are not large enough to permit sustaining loans to be made.

MRS. WILLIAM F. ALLEN MEMORIAL LOAN FUND—In 1925 a bequest was made to the University from the estate of Mrs. William F. Allen, and the former University League Loan Fund was merged with it. The fund now amounts to over $2,500 and is available for loans to women students upon recommendation of the Committee on Loans and Scholarships.

ALPHA EPSILON PHI LOAN FUND. In 1931 the National Chapter of Alpha Epsilon Phi Sorority established a loan fund for the use of responsible and scholastically meritorious women students who may be in need of aid. Upperclass students in the College of Letters and Science are given preference; interest is charged at the rate of four per cent per annum.

ARCHIBALD W. CASE LOAN FUND—In 1916, J. F. Case established the Archibald W. Case Loan Fund for engineering students, in memory of his son. For information address the Dean, College of Engineering.

EMERY LOAN FUND—In 1900 a fund was started by Miss Annie Crosby Emery, formerly Dean of Women, which is loaned to needy women students on recommendation of the Committee on Loans and Scholarships.

ARTHUR END MUSIC LOAN FUND—In 1919 the Arthur A. End music loan fund was established as a memorial by his mother, Mrs. Mary B. End, of Sheboygan, Wisconsin, with an initial payment of $100, to be loaned to students of music. For information address the Secretary of the Regents.

CORA RODERMUND EVANS LOAN FUND—In 1926 a bequest of $5,000 was made to the University from the estate of Mrs. Cora Rodermund Evans, with a provision in the will stating that the income from this amount is to be loaned to deserving students in the Medical Department of the University.

JOHN A. JOHNSON STUDENT AID FUND—The University is indebted to the liberality of Hon. John A. Johnson, late of Madison, for a gift of $5,000, made in 1876, the interest on which is loaned to students. The principal of this fund now amounts to about $30,000. The sum obtained by one student in one year shall not exceed $50, and the total amount shall not exceed $200.

BURR W. JONES LOAN FUND FOR LAW STUDENTS. In 1932 an initial gift of $400 was accepted from the Burr W. Jones Memorial Fund Committee for the establishment of this fund. Loans are made upon recommendation of the Dean of the Law School for terms of not more than one year, with the privelege of renewal for an additional year. Original loans draw interest at three per cent, and renewals at six per cent annum.

KEMPER K. KNAPP LOAN FUND—On January 16, 1924, the Regents accepted the gift of $5,000 from Kemper K. Knapp, of Chicago, for a fund to be used as a student loan fund. Since that time Mr. Knapp has increased the fund to $25,000. Loans are made under the following and such other regulations as the Regents may adopt: (1) loans to be made to students in attendance at the University of Wisconsin; (2) each loan before being made to be recommended by a committee of the faculty; (3) each loan to draw interest at the rate of three per centum per annum for the first term and at the rate of six per centum for each renewed term; (4) no loan or renewal of a loan to be made for a longer term than one year.

KUPPENHEIMER LOAN FUND—Mr. Albert B. Kuppenheimer, of Chicago, donated $1,000 in December, 1916, to establish a loan fund open to all men students under following conditions: (1) loans not to exceed one year; (2) joint signatures of responsible parties required; (3) interest, only after maturity, at six per cent; (4) administration to be in the hands of the general university loan committee.

LAKE MONONA WILD LIFE SANCTUARY LOAN FUND. In 1931 a gift of $200 was received for the establishedment of a fund to be loaned to worthy students. preferably Indians.

THOMAS J. MARSTON LOAN FUND—This fund was established in 1925 by a bequest from Mrs. Annie G. Marston in memory of her husband, the income to be used for the purpose of assisting poor, worthy, competent students in pursuing their undergradute studies in the University. The principal of the fund now amounts to approximately $23,000.

JOHN J. POSSEHL LOAN FUND FOR PHARMACY STUDENTS—In February, 1928, a gift of $1,000 was received from John J. Possehl, of Milwaukee, the amount to be held in trust and the income to be loaned each year to worthy students taking the pharmacy course. All repayments of loans are to be added to the principal. Loans to be made upon recommendation of the Director of the Course in Pharmacy.

ALEXANDER H. ROGERS LOAN FUND—Through the generosity of the sons of the late Alexander H. Rogers, of Chicago, the sum of $1,000 from the estate of Mr. Rogers has been turned over to the University to be used as a loan fund for the assistance of needy students. By the terms of the gift no one student may secure more than $250 from this fund.

ISRAEL SHRIMSKI LOAN FUND—In 1929 A. B. Kuppenheimer and John Wineberg of Chicago, friends of Israel Shrimski, a distinguished alumnus of the University of Wisconsin, gave $12,500 to perpetuate his memory. Loans are made under regulations similar to those governing the Kemper K. Knapp Fund.

ISRAEL SHRIMSKI STUDENT AID AND LOAN FUND—In 1929 the Regents received $2,000 from the estate of Israel Shrimski, as provided in his will. The money is to be loaned in such amounts and under such terms and conditions as the Committee on Loans and Scholarships may from time to time determine.

HENRY STRONG LOAN SCHOLARSHIPS—The Henry Strong Educational Foundation, established at Chicago under the will of General Henry Strong, makes an annual allotment to the University of Wisconsin for loan scholarships, available for use of men and women students under the age of twenty-five years, preferably in the upper classes, possessing not only zeal for leadership but also character and those traits tending to leadership, to aid them in obtaining a practical, literary, scientific, mechanical, or business education. The amount available for the year 1931-32 is approximately $2,000.

THE MAJOR LYMAN C. WARD MEMORIAL LOAN FUND—In 1919 a gift of $100 was received for the establishment of the Major Lyman C. Ward Memorial Loan Fund, the money to be loaned to men students only and preferably to undergraduates.

WISCONSIN ALUMNI ASSOCIATION LOAN FUND. On January 25, 1932, the Regents accepted from the Wisconsin Alumni association the gift of $3,500, later increased to approximately $8,500, to establish a student loan fund under the following regulations: (1) loans are to be administered by the faculty committee on loans and scholarships in consultation with the secretary of the Alumni association. (2) Loans are available to undergraduate men and women, both resident and non-resident (for the purpose of this loan an undergraduate is defined as "a student who has not received a degree in the school in which he is registered.") (3) Loans are no bear two percent interest while the recipient is enrolled as an an undergraduate, and four percent when he is no longer so enrolled.

SECRETARY'S LOAN FUND—The Secretary of the Regents in 1900 established a fund of $500 for the aid of meritorious students. Additions to the fund have been made by others. No loan shall ecxeed $50 in a single year, and the aggregate of loans to any person shall not exceed $200. The principal of this fund now amounts to about $3,000. For information address the Secretary of the Regents.

AGRICULTURAL COLLEGE LOAN FUND—In 1911 Albert B. Kuppenheimer, of Chicago, gave $750 to establish a loan fund in the College of Agriculture. In 1916 the outstanding balance of the Geneva Loan Fund was consolidated with the Kuppenheimer Fund, making a total of $1,500. This is loaned to needy students in small amounts with interest at six per cent after maturity. For information address the Dean, College of Agriculture.

COLLEGE OF ENGINEERING LOAN FUND—The College of Engineering Loan Fund was started in 1901 by a friend of the college in Milwaukee, to be used for the assistance of needy students. It has been added to at various times until it now amounts to about $1,800. For information address the Dean, College of Engineering.

WISCONSIN ENGINEER LOAN FUND—In 1923 the Wisconsin Engineer, a student publication, gave $500 to establish the Wisconsin Engineer Student Loan Fund. A further gift of $500 was received in 1928. Loans are made upon recommendation of the Dean of the College of Engineering. Students borrowing from the fund are informed as to the source of the money, and a report is to be made each year to directors of the Wisconsin Engineer, showing the use to which the money has been put. If the Wisconsin Engineer prospers in the future as it has in the past, substantial additions will be made to the fund.

LOAN FUND FOR PHARMACY STUDENTS—This fund was established in 1928 by the Milwaukee Chapter No. 19, Women's Organization, National Association of Retail Druggists, with an initial payment of $400. This fund is to be increased to $1,000. The income only is to be loaned to students in pharmacy, and preference is to be given to women.

PHYSICAL EDUCATION CLUB LOAN FUND—In March, 1929, a gift of $529.94 was received from the Physical Education Club to establish a loan fund for women majoring in physical education; the original amount of the fund has been increased by subsequent gifts. Loans are made upon recommendation of the Director of the Course in Physical Education for Women.

GRADUATING CLASS LOAN FUND—The Class of 1900 gave to the University several hundred dollars, the profit of the Senior Class Play, as the nucleus of a loan fund for the aid of needy students, to which several succeeding classes have made substantial additions.

CLASS OF 1885 LOAN FUND—In March, 1916, the Class of 1885 established a small loan fund for needy students.

CLASS OF 1912 LOAN FUND—The Class of 1912 left the balance in the class fund, amounting to $850, to establish a loan fund. The money was placed in the University Trust Fund and allowed to accumulate for ten years; the interest is available for loans. The principal of the fund now amounts to some $1,800.

CLASS OF 1913 LOAN FUND—The Class of 1913 turned over the proceeds of the class play, amounting to $396.48, and a number of the members of the class took out twenty-payment life insurance policies of $100 in the state life insurance fund. Dividends on these policies and interest earnings on the fund have been added annually. The principal of the fund now totals about $2,600. When the policies mature in 1933 the income each year will be loaned to students.

CLASS OF 1914 LOAN FUND—The Class of 1914 established a loan fund, each senior paying $2 a year for five years. The fund now amounts to approximately $1,500.

CLASS OF 1916 MEMORIAL LOAN FUND—The Class of 1916 established a loan fund now amounting to approximately $1,400. Principal and interest are to be loaned to students for periods of not to exceed one year; not more than $50 is loaned to one person. Three per cent interest is to be charged, with six per cent after maturity.

CHICAGO ASSOCIATION OF WISCONSIN ALUMNAE LOAN FUND—In 1913 the Chicago Association of Wisconsin Alumnae donated a fund for loans to needy women students. Preference is given to juniors and seniors and no student may draw more than $50 from the fund.

ROOM AND BOARD

The University owns and operates two dormitories for women, Chadbourne and Barnard Halls, accommodating about 275 students; also two for men, Adams and Tripp Halls, accommodating 500 students. In addition, there are five so-called cooperative houses, Tabard Inn, Charter House, Andersen House, Catherine Cleveland House, and Fallows House, where a total of 95 women students is accommodated. The occupants of these houses are usually chosen from students who have been in attendance at the University at least one semester, but a few rooms in each house are available for new students who come well recommended. Students living in these cooperative houses keep their expenses considerably lower than is possible elsewhere; for example, board is obtainable for $180 to $200 a year, instead of $225 to $250; rooms are from $90 to $150 a year. Information regarding these houses may be obtained from the Dean of Women.

Special interest houses open to women for both room and board include La Maison Française, Das Deutsche Haus, and Arden House, operated under the auspices of the departments of French, German, and English respectively. Both men and women rooming outside may take their meals at these houses.

All other students are dependent for rooms upon commercial dormitories, private rooming houses, the Y. M. C. A. building, and the various fraternity, sorority, and club-houses. The prices of single rooms outside of university dormitories range from $4 to $10 a week. A few double rooms can be rented for $2.50 a week per student, but the more desirable ones rent at $3 to $5 per student.

Lists of approved rooming houses for men and for women are prepared by the Dean of Men and Dean of Women respectively, from whom copies may be obtained. However, the supply of available rooms is ample, and, inasmuch as all arrangements for student rooms hold for an entire semester under ordinary circumstances, students are urged not to engage rooms which they have not seen, but to wait until they arrive in Madison before renting. All houses listed by the Dean of Women have been inspected by the staff of her office, and, although responsibility cannot be assumed by the University, such houses are believed to be suitable homes for women students. They accommodate women exclusively and in each case a parlor is provided for the reception of visitors. Permission to live in houses other than those inspected and approved is given only by the Dean of Women, and such permission must be obtained before the student engages a room.

Dining rooms are maintained in Chadbourne and Barnard Halls and in connection with the men's dormitories. In the Memorial Union the University provides a variety of dining services for students not living in dormitories. The combined dining rooms in the Union accommodate two thousand students a day. The Refectory, the largest room, serves three meals daily, cafeteria style; the Georgian Grill serves a la carte and table d'hote meals noon and night; and the Rathskeller provides light lunch and bar service for men at all times. In addition, seven private dining rooms are available to students for private dinners or banquets of any size. In private boarding houses and cafeterias, board ranges from $5 to $7 a week.

DORMITORY REGULATIONS

In accordance with an act of the Legislature of 1913, preference in the assignment of rooms in these halls is given to residents of the state of Wisconsin. When assignments are made for the following year, students living at one of the halls will be given preference over those who have not had such residence. Certain quotas by classes (freshman, sophomore, etc.) have been established; these are maintained until July 15, after which date all unassigned applicants constitute the general waiting list in order of deposit.

The halls and dining rooms are closed during the Christmas recess; during the spring recess the halls are open but the dining rooms are closed. University regulations require that board and room be paid in advance by the quarter.

Application for rooms will not be received until April 1; they should be sent to the Director of Dormitories and Commons, together with a deposit of $10 and a statement of the student's choice of dormitory, the permanent home address, and an indication of the class he will enter. Room assignments will be made beginning June 1.

Written acceptance of assigned rooms for the year must be received by the Department of Dormitories and Commons not later than September 1 or, for the second semester, January 20, or the deposit will be forfeited and the room reassigned. Those accepting rooms must take possession by 8 a. m. of the last registration day of the first semester, or the corresponding date of the second semester, or forfeit their deposit and room, unless written notification of late arrival is received by the department before that time and the room and board bill for the period is paid in advance. When a person remains on the waiting list after September 1, or January 20 in the case of the second semester, the deposit will be forfeited if an assignment is made before the beginning of classes and is not accepted or rejected promptly.

All rooms are assigned for the entire academic year and the student will be held for the rent of the room for the year, or until it is filled from the waiting list. All students are required to sign a contract covering room and board for the period of assignment. Students withdrawing must make satisfactory arrangements with the Department of Dormitories and Commons in advance.

Rooms will be ready for occupancy at the beginning of the academic year in September at noon of the day preceding the beginning of Freshman Period. Baggage marked with hall and room number will be received beginning the same day.

Requests for information regarding rooms, board, rates, assignments, and refunds should be addressed to the Department of Dormitories and Commons.

DORMITORIES FOR WOMEN

In Chadbourne Hall, accommodating 125 women, and Barnard Hall, accommodating 150 women, each room is provided with dresser, rocker, cot, bookshelves, rug, and study table, lamp, and chair. During the academic year, students are expected to provide towels, sheets, pillow cases, blankets, and couch covers. During the summer session, sheets, pillow cases, counterpanes, and two light-weight cotton blankets are furnished, but towels are not.

Women living in the dormitories are under the immediate charge of the hostesses of the halls and are subject to the rules of the Women's Self-Government Association of the University.

The rent for the school year of a single room in either Chadbourne or Barnard Hall is $160; of a room accommodating two, $130 per person; of two rooms *en suite* accommodating two, $160 per person. A few single rooms on the fifth floor of Barnard Hall are rented for $130 per student. Residents of Chadbourne and Barnard Halls are required to take their meals in the hall in which they reside. In addition, there are accommodations in the dining rooms for a number of other women students. The price of board has been fixed at $230 for the academic year, including the time from the beginning of classes in September to the last day of examinations in June, exclusive of Christmas and spring recesses.

DORMITORIES FOR MEN

Tripp and Adams Halls, modern fireproof buildings situated on the lake shore, are each designed to house about 250 men. Each hall is a quadrangle divided into houses accommodating about thirty men; each house is thus an independent unit with its own entrance, social rooms, toilet and shower facilities. This arrangement of units enables the men to become banded together in a congenial comradeship for social purposes and for participation in intramural athletic tournaments. The rooms are furnished in a comfortable and sturdy masculine style with chiffonier, bed, study table, lamp, and chair, bookshelves, arm chair, rug, waste-basket, and curtains. Bed linen, a bed cover, and two woolen blankets are supplied and laundered by the University, but students are expected to furnish towels and to provide for their personal laundry.

Residents are subject to the regulations of the Men's Dormitory Association, a self-governing body, and are expected to comply cheerfully with the requirements and obligations of this association, including the payment of the semester dues. There are very definite regulations governing quiet hours and conduct at social functions and in the dining halls. The university rules ap-

plying to all organized groups are in effect and enforced in the dormitories. A group leader known as the dormitory fellow has immediate charge of the men in his unit; his office is to give counsel and help in building up a strong social organization, and to aid the men in profitably pursuing their college careers.

The rent of a single room for the academic year is $140; of a double room $110 per person; of three-window end rooms, $180; and of two-window corner rooms, $160. There is only a very limited number of double rooms. Residents of the men's dormitories are required to take their meals in the adjacent refectory, in which there are also accommodations for a number of other men students. Board has been fixed at $240 for the academic year, including the time from the beginning of classes in September to the last day of examinations in June, exclusive of Christmas and spring recesses.

STUDENT LIFE

Much of the life and activity of students outside the classroom is concentrated in the University's new "living room," the Memorial Union, a splendid building erected and equipped at a cost of $1,250,000, largely through the generosity of more than 18,000 students, alumni, faculty, and friends of the University. Among the physical facilities of the Union are: cafeteria, large and small dining rooms, grill room, and lunchrooms; rooms for games, music, committee meetings, and assemblies; quarters for student publications and clubs; combined ballroom and banquet hall; library; spacious lounge; barber shop; writing room; checkrooms; alumni offices; and lodgings for transient alumni and visiting teams. By virtue of this wide range of facilities, the Memorial Union opens to the university community heretofore unequalled opportunities for formal and informal social gatherings of diverse types.

Upon registration and payment of his or her semester fees, including an amount of five dollars set aside for the maintenance and operation of the Memorial Union, each student automatically becomes a member of the Union and is entitled to all the privileges of the building during the semester. Life members of the Union (students who have paid a total of fifty dollars in Memorial Union fees or by subscription) are exempt from further payments and are accorded the privileges of the building for life.

FACULTY SUPERVISION

The Faculty Committee on Student Life and Interests has general supervision over all organized student activities, and its chairman, the Dean of Men, is available for correspondence and consultation regarding student affairs at all times. He will gladly confer with parents or guardians regarding individual men students, and he is anxious to get in touch with boys who are contending against illness, discouragement, financial worries or other obstacles to successful work in college. His office issues mimeographed lists of lodging and rooming houses for men students, with detailed information.

The academic and social welfare of women students is under the direct supervision of the Dean of Women, whose office is located in Lathrop Hall, a building designed for the use of women students. The dean and her staff of assistants invite correspondence with parents and guardians of women students and gladly cooperate with them in matters affecting their welfare. For the benefit of those women who cannot be accommodated in Chadbourne and Barnard Halls, the dean's office prepares annually lists of rooming and boarding houses for women students. New students desiring rooms should report at once to her office upon arrival in Madison.

STUDENT GOVERNMENT

THE WISCONSIN UNION

The Wisconsin Union is the organization of all men and women students, created to operate the new Memorial Union building and to provide a cultivated social program and a common life for its student, faculty, and alumni members. Its chief component parts are the Men's Union, representing the men of the University, and the Women's Self-Government Association, representing the women.

The central governing body of The Wisconsin Union is the Union Council, consisting of eight men and women student members and six alumni and faculty members, all elected or appointed by the bodies of Union members they respectively represent. Assisting the Union Council are twelve committees, planning for an extensive social program and controlling the several departments of the house: commons, library, program, women's affairs, graduate activities, studio, forum, etc.

The Wisconsin Union is an experiment not only in the integration of a diverse student population and in the enrichment of the hours outside the classroom, but also an experiment in student self-government and self-education.

MEN'S UNION

Every male student in the University is *ipso facto* a member of the Men's Union. Where Wisconsin men are concerned, the Men's Union is concerned; consequently it tries to set up in a subtle way, a set of standards by which the quality of a man at Wisconsin is to be judged, and tries to make it possible for a man to live a full-rounded man's life at the University. Among the more external agencies of which the Union avails itself to accomplish its purposes are: student dances, a winter sports program, a community chest, and a concert series which brings leading musical artists of the world to Madison.

The two formal units in the executive machinery of the Men's Union are the Union Board and the Subsidiary Union Board. The Union Board is the board of directors of the Men's Union, and it chooses the president and the other officers of the Union from among its own number; the Board is elected by the male members of the student body. The subsidiary body supplements the Board in carrying out the principal activities of the Men's Union; its members are chosen by the Board on the basis of effort, interest, and performance during a period spent as candidates in performing routine tasks.

WOMEN'S SELF-GOVERNMENT ASSOCIATION

Every woman student in the University is *ipso facto* a member of the W. S. G. A. The object of the Association is, in its own words, "To regulate all matters pertaining to the student life of its members which do not fall under the jurisdiction of the Faculty; to further in every way the spirit of unity among the women of the University to increase their sense of responsibility toward each other; and to be a medium by which the social standards of the University can be made and kept high." Each dormitory, each sorority house, and each lodging house where more than three girls reside, has one or more representatives on the board.

The Association each year provides entertainment of various sorts for university women, cooperates with Union Board in arranging social events for the whole University, and undertakes, in cooperation with a faculty committee representing different schools and departments and under direction of an as-

sistant in the office of the Dean of Women, the presentation of information concerning various occupations and professions for women through a biennial vocational conference and other mediums. A bulletin of information for freshman women, "If I Were a Freshman Again," is published by the Association and mailed out during the summer.

STUDENT HEALTH

THE DEPARTMENT OF STUDENT HEALTH was initiated by the University for the protection and adequate care of the health of students. Upon first admission to the University, *each student, including those in the Graduate School,* is required to undergo a medical examination for the purpose of determining his medical and physical status. Based on the findings of this examination, special recommendations are made to the dean of the student's college and to the Departments of Physical Education and Military Science to safeguard the interests and health of the individual.

Students are notified at the time of registration when and where to report for examination and *they must be punctual in keeping such appointments, assured that these take precedence over all class work.* Excuses for any class or laboratory work missed on account of the medical examination will be granted in every instance. Where, in the case of graduate students, teaching hours conflict with the pre-arranged time for the compulsory medical examination, *an immediate phone call* to the Student Health Department will secure for such applicants *another appointment at a mutually convenient hour.*

The chief function of the service is to prevent illness in the student population. In order to accomplish this aim, the cooperation of each student is necessary, since the protection of the whole depends upon the maintenance of health in the individual. Whenever illness occurs, the medical staff is ready to meet the need of the individual. Consequently, the prompt reporting of illness works to the advantage of both the individual and the community.

THE AMBULATORY CLINIC, situated on the main floor of the infirmary, maintains an adequate staff of physicians and nurses for the needs of all students able to report in person. Hours for consultation are 8 a. m. to 12 noon and 2 to 4 p. m. on week days, excepting Saturday afternoon, and 9:30 to 10:30 a. m. on Sunday; students are requested to observe these hours except in emergency cases. A member of the staff will see or visit emergency cases at any hour with an appreciation of the grave possibilities of minor illness. Early attention to each and every indisposition is encouraged.

THE STUDENT INFIRMARY, a modern hospital of approximately 100 beds connected with the Wisconsin General Hospital, provides facilities for the care of students who are confined to bed or who need nursing attention. It is desirable that all such students avail themselves of these privileges rather than to remain in their rooms, in order that they may receive adequate medical and nursing attention and that the spread of communicable diseases may be checked.

ABSENCE. Statements of absence from classes because of illness should be obtained promptly through the Clinic or Infirmary as the case may be. Application for excuses must be made within a week after return to classes.

EXPENSE. The clinic is maintained by the University as a part of the administration of general student welfare without expense to the student. The infirmary is supported by $4.50 of the student's general fee and all necessary laboratory and nursing service is rendered without charge to the student. Care of specialists and special nursing in individual cases are matters of extra expense, and arrangements for them may be made through the infirmary staff.

SOCIETIES AND PUBLICATIONS

LITERARY, FORENSIC, AND DRAMATIC SOCIETIES

The men's literary societies are: Athena, organized in 1850, and Hesperia, organized in 1854. These societies are interested principally in debating. The women's literary societies are: Castalia, organized in the early years of the University and Pythia, organized in 1902. Most of their time is devoted to more general literary pursuits and not extensively to debating. The University is a member of the Western Conference Debate League composed of Northwestern University, Purdue University, and the Universities of Michigan, Illinois, Minnesota, Iowa, Indiana, Ohio, and Wisconsin. Each University meets four others in debate annually. From time to time additional intercollegiate debates are arranged. Wisconsin meets the Universities of Iowa and Minnesota annually in a triangular league for women.

The University regularly competes in the annual contest of the Northern Oratorical League, composed of Northwestern University, Western Reserve University, and the Universities of Iowa, Michigan, Minnesota, and Wisconsin. Positions on the University debating teams are won in open competition, both undergraduate and graduate students in good standing being eligible. The privilege of representing the University in the Northern Oratorical League contest is won in the local David B. Frankenburger contest, open to undergraduates in good standing.

Participation in intercollegiate debating or oratorical contests makes a student eligible for membership in the Wisconsin Chapter of the national honorary forensic fraternity, Delta Sigma Rho, which, together with the Forensic Board, represents the organized student control of forensic affairs in the University.

The general dramatic club, Wisconsin University Players, is composed of both men and women and is open to all students who upon tryout show either sufficient dramatic talent or special ability in the fields of production or management. The club gives several formal productions during the year in the University Theatre. They also give a series of laboratory plays as open meetings which the public may attend.

Haresfoot Club is a men's dramatic organization devoted to the annual production of an original musical comedy in which all the rôles are taken by men.

PROFESSIONAL SOCIETIES

A number of professional clubs and societies for the promotion of interest in specific lines of academic or technical work have been organized and are usually maintained under the guidance of the departments concerned. In other departments where no such organization has been effected, similar results are reached by means of senior and graduate seminaries.

RELIGIOUS ORGANIZATIONS

Prominent among the religious organizations of the University are the Young Men's Christian Association and the Young Women's Christian Association. These organizations maintain secretaries who devote their entire time to religious, social, and philanthropic work among the students. Nine student pastors supported by eight religious denominations, each with its own student organization, cooperate with the secretaries and promote religious work in the student body in a systematic way.

MUSICAL ORGANIZATIONS

The University Band, consisting of about 200 men, is divided into a concert band and a second band, the latter serving as a training school for the less experienced players. Rehearsals are held two and three times weekly, respectively. Underclassmen playing in the band may receive credit in satisfaction of the physical activity requirement. Upperclassmen who are members of the concert band and who remain for duty at commencement are compensated for their services to the extent of thirty dollars each.

The University Orchestra, composed of about 75 players, is organized for the purpose of studying the larger classical forms and presenting them in public. Membership is open to qualified students of all classes. The Second Orchestra is open to all University students who through lack of experience or conflict of hours do not play in the regular University Orchestra. The fundamentals of orchestral playing are stressed in the study of the easier types of music. Practical experience in conducting and interpretation is offered.

The Men's Glee Club, incorporated under the laws of Wisconsin, is composed of a concert club and a second club, membership in each of which is determined by competitive tryouts. The concert club makes an extensive annual tour throughout the Middle West and has gained everywhere a most enviable reputation by maintaining the highest standard of chorus singing.

The Women's Glee Club is an organization of forty-five women which makes public appearances locally. Membership is open to all women students and vacancies are filled by competitive trial. The University Singers, an organization of fifty voices, studies and performs masterpieces of choral literature. The A Cappella Choir is limited in number to thirty-two; it presents in concert the best part songs in musical literature. Membership in these two groups is on a competitive basis and is open to any student in the University.

SOCIAL ORGANIZATIONS

The social life of the undergraduate finds expression in about a hundred fraternities, sororities, and other house groups, and in a great diversity of clubs and societies, many of them organized principally around professional or other special interests but usually embodying a distinct element of comradeship as well. To catalog even the more important of these organizations would serve no very useful purpose, inasmuch as the student, if he has the time and other requisites for membership, usually has no difficulty in making the necessary contacts with organizations of the sort in which he may be interested.

STUDENT PUBLICATIONS

Student publications include the *Daily Cardinal,* a morning newspaper published in its own printing plant adjacent to the campus; the *Octopus,* an illustrated humorous monthly; the *Wisconsin Engineer* and the *Wisconsin Country Magazine,* monthlies edited and managed by students of these colleges and containing material of professional interest and the *Badger,* a comprehensive and elaborate annual issued under the auspices of the senior class. Positions on the editoral and business staffs of these publications are ordinarily open to all qualified students above the rank of freshman; appointments are made by the various boards of control on the basis of experience and ability.

HONORARY FRATERNITIES

The honorary fraternities with the dates of their establishment at Wisconsin are:

Alpha Gamma Pi (Women's Commerce), 1918
Alpha Epsilon Iota (Women's Medical), 1926
Alpha Kappa Delta (Sociology), 1922
Alpha Omega Alpha (Men's Medical), 1926
Alpha Zeta (Agricultural), 1905
Artus (Economics), 1912
Beta Gamma Sigma (Men's Commerce), 1913
Chi Theta Epsilon (Civil Engineering), 1924
Delta Phi Delta (Art), 1921
Delta Sigma Rho (Forensics), 1906
Eta Kappa Nu (Electrical Engineering), 1910
Gamma Alpha (Graduate Scientific), 1910
Gamma Epsilon Pi (Women's Commerce), 1922
Gamma Sigma (Gymnastics), 1918
Order of the Coif (Law), 1907
Omicron Nu (Home Economics), 1915
Phi Beta Kappa (Academic), 1898
Phi Delta Kappa (Educational), 1921
Phi Eta Sigma (Men's Freshman Scholastic), 1927
Phi Kappa Phi (General), 1919
Phi Lambda Upsilon (Chemical), 1906
Phi Mu Alpha Sinfonia (Men's Musical), 1921
Phi Sigma (Biological), 1917
Pi Epsilon Delta (Dramatic), 1919
Pi Tau Sigma (Mechanical Engineering), 1916
Rho Chi (Pharmaceutical), 1925
Scabbard and Blade (Military), 1905
Sigma Delta Chi (Men's Journalistic), 1911
Sigma Delta Epsilon (Women's Graduate Scientific), 1921
Sigma Delta Psi (Athletic), 1917
Sigma Epsilon Sigma (Women's Freshman Scholastic), 1927
Sigma Sigma (Medical), 1908
Sigma Xi (Graduate Scientific), 1907
Tau Beta Pi (Engineering), 1899
Theta Sigma Phi (Women's Journalistic), 1910

PART III—ADMISSION

METHODS OF ADMISSION

There are four general methods by which admission to undergraduate standing in the University may be obtained; in each case the general requirements for admission (see next page) must be fulfilled.

1. By presenting a certificate of graduation from an accredited high school, with the recommendation of the principal (see page 37).
2. By passing entrance examinations (see page 39).
3. By qualifying as an adult special student (see page 39).
4. By submitting evidence of studies successfully pursued in another institution of higher learning (see page 40).

By corresponding with the University Registrar, prospective freshmen and adult special students may learn at any time of year whether or not they have the necessary qualifications for admission and upon what basis they may be admitted. Prospective students who have had some college work should correspond with the Advanced Standing Committee (see page 40). Students may enter the University at the opening of either semester or of the summer session, but all credentials should be filed sufficiently in advance of the date chosen to permit the authorities to pass upon them and to issue the proper certificates of admission. Candidates for admission in September are responsible for having their credentials filed by the first of August. The credentials must in every case include a complete record of all previous secondary school and advanced work.

FRESHMAN PERIOD

All freshmen are required to be present at the University on the Wednesday preceding the beginning of instruction in September 1932 and to remain throughout the week. This period (September 14-20) will be devoted to registration, conferences with advisers, physical examinations, aptitude tests, special educational examinations, assignments to classes, lectures and discussions on subjects of importance to new students, and a general introduction to university life.

Because attendance throughout the entire period is required, it is essential that all details connected with admission be attended to as early as possible. Students who graduate from high schools or academies in June should inform their principals sometime in May or early in June of their intention to attend the University in the fall, so that the necessary certificates may be prepared and other important data furnished to university authorities. No guaranty of admission can be made to prospective students whose credentials are not in the hands of the Registrar by August first. So far as possible, candidates who will need to take entrance examinations should avail themselves of the June examination period; this means that candidates with dubious records and those from non-accredited schools outside the State would do well to correspond with the Registrar before June first.

Rooms for the semester should be secured in advance of Freshman Period so that there will be no confusion, uncertainty, or waste of time during the days when attention should be centered on "getting started."

GENERAL REQUIREMENTS

Fifteen units*, distributed as follows, are the fundamental requirement for regular admission to any college or course in the University, excepting certain special short courses in the College of Agriculture, as specified on the next page:

I. Two units of English are required of all entrants; three units are recommended for all and are required of those who do not offer two units of foreign language.

II. One unit of algebra and one of geometry are also required of all, with an additional half or whole unit of algebra recommended for those seeking admission to the College of Engineering.

III. Two units of science or history, or two units of one of the following foreign languages—French, German, Greek, Hebrew, Italian, Latin, Norse, or Spanish—must be presented by all. If foreign language is offered there must be at least two units in a single language, although in exceptional cases one unit may be offered as the optional subject.

IV. The remaining units necessary to bring the total to fifteen must be offered from Groups A and B, with a maximum of four units from Group B and a total of not more than four units in any single subject.

GROUP A

	Units
English	1—2
Foreign language	
French	1—4
German	1—4
Greek	1—3
Hebrew	1—2
Italian	1—2
Latin	1—4
Norse	1—2
Spanish	1—4
History and Civics	
History	1—4
Civics	½—1
Economics	½
Mathematics	
Advanced algebra	½—1
Solid geometry	½
Trigonometry	½
Science	
Botany	½—1
Biology	1
Chemistry	1
General science	½—1
Geography	½—1
Physics	1
Physiology	½
Zoology	½—1

GROUP B

	Units
Agriculture	1—4
Bookkeeping	½—2
Commercial law	½
Commercial arithmetic	½
Commercial geography	½
Business organization, Office practice, Salesmanship — If taken in the junior or senior year	½ each
Shorthand	2
Typewriting (only ½ unit if not combined with shorthand)	½—1
Domestic art	1—2
Domestic science	1—2
Drawing, art and design	1—4
Mechanical drawing	1—4
Shop work	1—2
Shop work and drawing	1—4
Music	1—4
History and appreciation	1
Theory and harmony†	2
Choral music	½—1
Orchestra	½—2
Band	½—2
Applied music	½—2
Optional (not including drill subjects such as penmanship, physical education, or military training)	½—1

†Not less than 2 units accepted.

*Entrance requirements are stated in units of high-school work, a term which is not to be confused with the term credit as applied to university work. A unit represents five class periods a week in one branch of study for a school year of at least 36 weeks. Two laboratory periods in any science or vocational study are considered equivalent to one class period. In closely alliedsubjects, such as botany and zoology, not usually taught throughout an entire year, units may be constructed by adding the respective time values of the subjects. Three periods a week for a year and a half may be counted as one unit.

SPECIAL REQUIREMENTS

COLLEGE OF AGRICULTURE. For admission to the Short Course and Dairy Courses students must be at least sixteen years of age and must have a good common school education. Candidates for the Winter Dairy Course are required to have at least six months of experience in a creamery or cheese factory before being admitted.

COLLEGE OF ENGINEERING. Students planning to enter this college are advised to include in their high-school work the following subjects: 1½ or 2 units of algebra, 1 unit of plane geometry, ½ unit of solid geometry, 3 units of English, 2 units each of science and history, and 2-4 units of foreign language.

SCHOOL OF COMMERCE. Two full years of work in one of the General Courses in the College of Letters and Science, or the equivalent thereof, including eight credits in elementary economics, are required for admission. Students are strongly advised to include also eight credits in mathematics and seven in accounting.

SCHOOL OF EDUCATION. The regular university entrance requirements apply to students entering the special courses (Art Education and Physical Education). For others, two full years of work in the College of Letters and Science are required for admission.

SCHOOL OF JOURNALISM. For admission to this school, two full years of work toward the B.A. degree in the College of Letters and Science, or the equivalent thereof, are required, ordinarily including the special studies of the pre-journalism sequence as noted under that heading.

LAW SCHOOL. Candidates for the degree are required to present for admission the equivalent of three full years of work in the College of Letters and Science. A limited number of students who have reached their majority and who have the general entrance requirements stated above and two years of college work may be admitted as special students.

LIBRARY SCHOOL. The numerous special requirements are given in detail under the heading Library School, which see.

MUSIC SCHOOL. The special requirements are set forth under the heading School of Music, which see. It is advisable that such students should include in their high-school work music courses listed in Group B above, as outlined under "Scope of Preparatory Work", page 46.

ADVISED GROUPING OF PREPARATORY SUBJECTS

Students are advised to adapt their preparatory work to the course they expect to pursue in the University. Attention is called to the special admission requirements of the various colleges and courses and to recommendations regarding preparation in foreign language. Students expecting to go to the University and who are uncertain as to the college in which they will take their work, are advised to distribute 12 of the 16 units of the high-school course as follows: at least 2 units each of mathematics, science, and history; 2 to 4 units of foreign language; and at least 3 units of English, or 4 if less than 3 units of foreign language are offered. Extra units of history, science, or mathematics should replace foreign language if none is offered.

FOREIGN LANGUAGE

COURSES LEADING TO THE BACHELOR OF SCIENCE DEGREE

Although foreign language is not definitely required for admission to any caurse, failure to present it will result in greatly curtailing the student's free elections in completing the requirements for graduation from certain courses. Those who expect to take any of the following named courses should preferably present units of foreign language as indicated:

College of Letters and Science

Course in Chemistry—2 units of French; 2-4 units of German
Course in Hygiene—2-6 units, any languages listed
Medical Science Course—2 units of Latin; 2-4 units of French or German
Pharmacy Course—2-4 units of French; 2-4 units of German

College of Agriculture

Course in Home Economics—2-4 units in one language or 5 units in two

School of Education

Course in Physcial Education for Men—3 units in one language or 2 units in each of two
Course in Physcial Education for Women—4 units, any languages listed

COURSE LEADING TO THE BACHELOR OF ARTS DEGREE

The attainment of *some degree of proficiency* in one or more foreign languages before entering the University, as opposed to *mere completion* of foreign-language courses in high school, will be of great advantage in meeting the new requirements for graduation from those courses in the College of Letters and Science which lead to the Bachelor of Arts degree. (See Announcement of the College of Letters and Science for statement of attainment examinations for proficiency and for intermediate knowledge in a foreign language.) Students who expect to enroll in one of the following named courses of study are strongly advised to prepare themselves in foreign language as indicated:

College of Letters and Science

General Course, Course in Commerce*, Course in Journalism—4 units of French, German, Latin, or Spanish, with a possible addition of 2-4 units of another language listed under Group A above

Course in Humanities—4 units of Latin, and 2-4 units of Greek, French, or German

General Course, with major in Medical Science—2 units of Latin and 4-6 units in French or German or both.

Course in Music (Bachelor of Music degree)—See General Course above.

COURSES LEADING TO THE BACHELOR OF PHILOSOPHY DEGREE

No foreign language is definitely required for this degree, but if the student has completed four years of one language in high school he may take an attainment examination, success in which will relieve him of certain other requirements for the degree.

*No foreign language required in Commerce if student is a candidate for the Ph.B. degree.

ADMISSION UPON CERTIFICATE

FROM WISCONSIN SCHOOLS

Graduates of accredited high schools may enter the University, without examination, upon presentation of a certificate showing the satisfactory completion of the fifteen required units and bearing the recommendation of the principal. Only the form prepared by the University is acceptable, a supply of which may be obtained from the Registrar by the principal. The completed certificates should be returned to the University before August 1.

Before applying for admission to the University, graduates are urged to confer with their principals, seeking information as to the significance of ratings in the college aptitude test given to all seniors in Wisconsin high schools. This rating, combined with the high-school record, is valuable insofar as it enables the principal to interpret a prospective student's chance of success in college.

Principals of accredited schools are requested to note the statement on page 41 regarding the examination of freshmen in English. A similar examination in algebra is given to freshmen in the College of Engineering.

Graduates of four-year non-accredited schools in Wisconsin who have satisfied the full requirements for admission to the University may be admitted on probation, without examination, upon recommendation of the principal.

Any high school or academy in the state whose course of instruction covers the branches required for admission to the University may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a committee of the Faculty. Upon application made by an officer of any high school or academy in the state to the Chairman of the Committee on High-School Relations, the University will examine the school with reference to placing it upon its accredited list of preparatory schools. The examination, which will be conducted by a committee of the Faculty, will cover the course of study and methods of instruction in the school. No school can be placed upon the list whose course of study is not fully equal to the four-year course for high schools recommended by the State Superintendent.

Any high school or academy with a complete four-year course which does not include foreign language may be admitted to the accredited list under the conditions stated, provided its course of instruction covers fifteen units in the subjects accepted for admission to the University.

FROM SCHOOLS OUTSIDE WISCONSIN

1. Graduate of secondary schools outside Wisconsin, included in the current list of accredited schools of the North Central Association, may be admitted when recommended and certified by the principal as indicated above, provided the minimum admission requirements of the University be fulfilled. The grades must average *fair* or above, and the record of the last two years in the secondary school will be given special and critical consideration.

2. Graduates of other secondary schools outside Wisconsin may be admitted when properly recommended and certified, provided: (a) That the school maintains, on the basis of regular inspection, accredited relationship with the state university, or other university within the state included in the membership of the Association of American Universities. The state university must maintain the same standard of admission requirements as those institutions belonging to the Association of American Universities. (b) That the minimum admission re-

quirements of the University of Wisconsin be fulfilled as to both number of units and character of work. In such cases the character of the work submitted is interpreted to mean an average standing of *good*.

Credentials properly certified by the principal on forms provided by the University should be submitted for approval before August 1.

DEFICIENCIES IN ENTRANCE REQUIREMENTS

Graduates of secondary schools who fail to gain the recommendation of their principals because of low grades will be required to take entrance examinations in those Group A subjects in which they are deficient. A deficient grade is one lower than 77 when 70 is the passing grade of the school, or below 81 on the basis of 75 as passing.

Graduates of schools which have established a "recommending grade" will be required to take entrance examinations in those subjects in which they failed to receive this recommending grade.

Graduates who do not have the required fifteen units will take entrance examinations in those subjects in which they lack credit.

Applicants for admission who are required to take entrance examinations as indicated above must also take a college aptitude test which will be used in conjunction with the entrance examinations for determining admission.

Entrance examinations are given three times a year, in September, February, and June, as specified in the calendar; no special examinations are given. Those who are likely to be required to pass entrance examinations in order to gain admission will do well to correspond with the Registrar as soon as possible so that they may be informed early of their deficiencies and thus have ample time to prepare themselves for examination. There is likely to be less severe disappointment if candidates take the examinations in February or June, since, if rejected, they still have opportunity to seek admission to some other institution.

Graduates of accredited schools whose academic subjects average less than 77 with 70 as the passing grade of the school, or less than 81 with 75 as passing, are urged not to apply for admission to the University because their chances for success in college are slight. If they are admitted it will be only on probation.

ADVANCED CREDIT

Advanced credit for high-school work may be granted to students with satisfactory average standings who present more than fifteen units acceptable for admission, provided: (a) the subjects in which advanced credit is sought are the general subjects accepted for admission to the University; (b) the work is as advanced as work given in the freshman year; (c) the course for which credit is desired be approved by the chairman of the department; and (d) the student passes a satisfactory examination at least two hours in length, held at the University before or during the Christmas recess. No advanced credit will be given for work in language unless it be in excess of six units of language offered for admission, nor will advanced credit be given for less than three semester hours.

ADMISSION UPON EXAMINATION

Applicants for admission who have not been graduated from a secondary school may be admitted to the University upon passing entrance examinations in the required number and kinds of units as specified above. These examinations are given three times a year, in February, June, and September, on the dates indicated in the calendar; no special examinations of any sort are given. All candidates are expected to correspond with the Registrar before presenting themselves for examination, and all must be present at 9 o'clock on the first examination day. Candidates may divide the subjects and take the examinations in two trials, but failure to pass all the subjects in two trials will necessitate complete re-examination. The Registrar will furnish, upon request, information as to the character of the examinations.

Results of College Entrance Board Examinations are accepted in lieu of passing these entrance examinations.

In general, it is preferable for prospective entrants to submit to examination in February or June rather than in September, since failure at the latter date may result in a sudden change of plans at the very outset of the academic year.

These admission examinations are also open to high-school graduates who may be deficient in certain subjects and who therefore are unable to take full advantage of the certificate plan of admission.

ADMISSION ON THE ADULT SPECIAL BASIS

Citizens of Wisconsin, twenty-one years of age or over, who do not possess all of the requirements for admission and who are not candidates for a degree, may be admitted to the College of Letters and Science or the College of Agriculture upon giving satisfactory evidence that they are prepared to take advantageously the subjects open to them. Such students are normally required to select their studies only from courses open to freshmen. If they desire to take a study to which only advanced students of these colleges are regularly admitted, they must show special preparation or aptitude for such course. This privilege of admission is granted in the College of Engineering only to students who are able, on examination, to meet all the entrance requirements in mathematics or who have completed their preparatory mathematics in the Extension Division of the University and present a certificate therefrom, duly approved by the chairman of the Department of Mathematics. The privilege of admission on the adult basis is rarely granted in the Law School and then only to students who can meet the regular entrance requirements to the College of Letters and Science.

Candidates applying for admission on the above basis are required to present to the Registrar in advance of their coming an official detailed statement of their preparatory studies for evaluation and approval.

Students will not be admitted, save in exceptional cases, directly from the secondary schools to the status of adult specials; nor will graduates of accredited schools be permitted to enter as adult specials, since they are required to qualify for regular matriculation.

Before beginning their third year, students admitted on the adult basis must have fully satisfied all entrance requirements. When all entrance requirements have been thus absolved, such students may continue work in the University, will receive regular classification, and may be accepted as candidates for a degree.

ADMISSION WITH ADVANCED STANDING

Students from accredited normal schools, colleges, and universities who have pursued college courses equivalent to those of the University of Wisconsin with an average standing of at least C on an A-B-C-D-Fail grading basis, and who have been granted honorable dismissal from their former institutions, may be admitted to the University. Former students of such institutions can not be received as freshmen on the basis of their preparatory school records.

Applicants for admission who have had any work whatsoever in another institution of higher learning, regardless of whether or not they wish to receive credit for it, must submit complete credentials of both their high-school and "college" work to the proper authorities of the specific college which they desire to enter, and not to the University Registrar. Applicants who wish to enter the College of Engineering should send their records to the Dean of that College; those entering the College of Agriculture to the Assistant Dean; and all others to the Chairman of the Advanced Standing Committee. All such transcripts should be sent at least six weeks preceding the opening of the session which the student desires to enter.

Not more than one-fourth of the number of credits required for a four-year course will be given for a single year's work in another institution. This maximum will be given only when the student makes an average of C or better during his first or second semester at Wisconsin. At least the senior year's work (30 credits and 30 grade-points) must be earned in residence at Wisconsin, and students can therefore expect at best not more than three years of advanced standing on transfer.

In the College of Letters and Science, freshmen are limited in their elections to English composition, foreign language, history, mathematics, natural sciences, and drawing. Students who wish to receive full credit for their freshman year at other colleges should, therefore, make up their programs from these subjects. Studies not open to freshmen at Wisconsin, such as philosophy, education, and sociology, will ordinarily not be credited if taken in the freshman year at another institution. A point-credit ratio (see page 51) of 1.3 for the first two years is now required of University of Wisconsin students for admission to the junior year of this College. This authorizes the admission of only those transferred students whose grades are such as to warrant the belief that they will do work of this calibre at Wisconsin.

ADMISSION TO THE SUMMER SESSION

Applicants for admission to the Summer Session who wish to work for a degree at Wisconsin must file regular transcripts as specified in the preceding paragraphs; this requirement also applies to all persons seeking admission to the Law School or the Graduate School, regardless of their intention of securing a degree. All other summer session applicants who have not previously been matriculated at Wisconsin are required to furnish documentary evidence of good standing.

All other summer session applicants who have not previously been matriculated at Wisconsin are required to furnish documentary evidence of good standing. For a teacher this will consist of a statement of his or her status in the school where employed, signed by a responsible official of such school; for a student at another institution, an official statement of good standing thereat; for others, appropriate statements of attainments, occupation, and purpose. These statements are to be filed in advance so that necessary permits to register can be issued.

SCOPE OF PREPARATORY WORK

The following description serves to indicate the extent of the preparation expected in each of the several subjects named in the preceding requirements for admission:

ENGLISH

2, 3 or 4 units. Candidates for admission must present two units in English, one in composition, and one in the reading and study of English classics. These two units correspond to the work of the first two years of the standard high-school course, in which half of the time is devoted to theme writing and instruction in composition, and half to the detailed study of a number of the English classics. At least three units in English are recommended, the third unit to consist of additional work in composition, and either (1) an outline history of English or American literature with the reading and study of selections of each period, or (2) the intensive study of a few typical examples of the novel, the drama, the lyric, and the essay. Four units of English should include composition and both (1) and (2) given above, in addition to the required units.

THE TWO UNITS REQUIRED OF ALL

COMPOSITION AND RHETORIC. Practice in theme writing with instruction in the principles of composition and the forms of discourse must form an important part in each unit of English presented for entrance. Every entrant is examined as to his ability to express himself in clear, correct, idiomatic English. The test consists in writing several essays on familiar subjects, in which the student plans his work by paragraphs and constructs both paragraphs and sentences in accordance with the simpler principles of composition. No student will be passed in this test and premitted to pursue the course in freshman English whose work shows serious weakness in spelling, punctuation, grammar, sentence construction, or division into paragraphs. Facility of expression will not be sufficient to offset marked deficiencies in these respects. A more detailed statement of the requirements for admission to freshman English is given in University Bulletin, High-School Series, No. 25. Students deficient in English composition must make up such deficiency in one year or be dropped from the University. The University provides special instruction for such students.

READING AND STUDY OF ENGLISH CLASSICS. The two units required in English should include the thorough study of at least ten of the English classics on the list of uniform college entrance requirements in English, or their equivalents. The primary aim of the study of these selections should be the interpretation of the works as independent units; other considerations, such as form, biography, literary history, or critical comparisons, though they should not be neglected, should be kept subsidiary to this main object.

UNITS IN ADDITION TO THE TWO REQUIRED OF ALL

HISTORY OF ENGLISH AND AMERICAN LITERATURE. 1 unit. In addition to the required units in English, one unit in the history of English literature or in the history of English and American literature may be presented. The greater part of the time should be devoted to the reading of selections from representative authors of each period. In the study of the history of literature, which should occupy no more than one-quarter of the time, emphasis should be placed on general movements and tendencies as shown in the selections studied. In the history of English literature characteristic selections from most of the following authors should be read: Chaucer, Shakespeare, Bacon, Milton, Pope, Addison, Goldsmith,

Gray, Burns, Scott, Wordsworth, Coleridge, Keats, Shelley, Tennyson, Browning, Lamb, George Eliot, Dickens, and Thackeray. In American literature selections from the following: Longfellow, Whittier, Bryant, Holmes, Irving, Hawthorne, Cooper, Poe, Lowell, and Emerson. A study of the principles of composition and practice in theme-writing must be included in this unit.

ADVANCED STUDY OF CLASSICS. 1 unit. In addition to the two units of required work, which include the reading and study of English classics, students may offer one unit representing advanced work in the study of literature. This should consis of an intensive study of typical examples of the novel, the drama, the lyric, and the oration or the essay. At least one work from each of the following four groups should be included: I. (a) Thackeray's *Henry Esmond;* (b) Hawthorne's *The House of Seven Gables;* (c) Dickens' *A Tale of Two Cities;* (d) George Eliot's *Silas Marner.* II. Shakespeare's (a) *Macbeth,* (b) *Hamlet,* (c) *King Lear.* III. Palgrave's *Golden Treasury* (First Series), (a) Books ii and iii, or (b) Book iv; (c) Milton's *Lycidas, L'Allegro,* and *Il Penseroso.* IV. (a) Burke's *Speech on Conciliation;* (b) Webster's *First Bunker Hill Oration,* and Washington's *Farewell Address;* (c) Macauley's *Life of Johnson, Essays on Milton;* (d) Carlyle's *Essay on Burns.* A study of the principles of rhetoric, with ferquent and systematic theme-writing, must form a part of this unit.

MATHEMATICS

ALGEBRA. 1, 1½, or 2 units. The one required unit should include: addition, subtraction, multiplication, division, equations of the first degree with one unknown number, simultaneous equations of the first degree, including the graphical solution of a pair of linear equations with two unknowns, factors, highest common factor, lowest common multiple, solution of quadratic equations.

A third half year of algebra is strongly recommended for all students and is required of engineering students. The work should cover: the theory of quadratic equations; elementary theory of exponents and radicals; systems of non-linear equations including linear quadratic systems, quadratic systems containing no first degree terms; graphic representations of quadratic equation in two variables: examples involving binomial theorem with positive integral exponents; arithmetical and geometrical progressions; logarithms; ratio, proportion, and variation.

If a fourth half year is given it should cover: proof of binomial theorem for positive integral exponents, with examples involving negative and fractional exponents; polynomials and equations of any degree in one variable, including factor theorem, remainder theorem, determination of rational roots, graphic and algebraic approximate determination of real irrational roots, roots common to two equations, relation between roots and coefficients of the equation; permutations and combinations; determinants.

GEOMETRY. 1 unit of plane geometry. An additional half year of solid geometry is strongly recommended for students who expect to enter the College of Engineering.

TRIGONOMETRY. ½ unit. The fundamental properties of the trigonometric functions, the addition theorem and the more important formulas which follow from it; the solution of the various cases of right and double plane triangles; the use of logarithmic and trigonometric tables.

Additional credit. ½ or 1 unit for work in algebra, trigonometry, surveying or other mathematics; total credit not to exceed 4 units

HISTORY, CIVICS, AND ECONOMICS

HISTORY. 1, 2, 3, or 4 units. History may be offered in the following blocks of 1 unit each: ancient, ancient and medieval, European to approximately the end of the 17th Century, medieval and modern, modern European, English, United States. One, two, three, or four blocks may be presented. A real equivalent may be presented in place of a recommended block, but a one-year course in general history will not be accepted.

CIVICS. ½ or 1 unit. This may comprise the study of government in its relation to either the local community or the nation, or both. It may be combined with history or economics in the construction of an elective unit.

ECONOMICS. ½ unit. A knowledge of the fundamental principles of economic science as presented in a good elementary treatise.

SCIENCE

BIOLOGY. 1 unit. This course should include plant biology, animal biology, and human biology or physiology. The course should include demonstrations by the teacher and individual laboratory work on the part of pupils. Biology should be upon the same basis as physics and chemistry.

BOTANY. 1 unit. A study of the life histories of types from the main groups of plants, with a series of simple physiological experiments. At least two-thirds of the course should consist of laboratory work. If it is impracticable to give a full year's work to the subject, botany may be combined with physical geography, physiology, or zoology to construct units.

CHEMISTRY. 1 unit. A study of the more common elements and their compounds. This course should include about four or five actual hours of work a week in the laboratory, and two or three periods a week in the classroom throughout the year. Two laboratory periods are considered as equivalent to one class exercise. A laboratory notebook must be kept.

PHYSICS. 1 unit. Not less than three classrooms periods a week, and not less than four actual hours of work a week in the laboratory. A record of all work done should be kept in a notebook. Any standard textbook may be used.

PHYSICAL GEOGRAPHY. 1 unit. To include: (1) The principles as presented in the best recent textbooks, which give adequate treatment of the atmosphere and ocean, and emphasize the development and influence of topographic forms. (2) Field study adapted to the locality; every candidate must submit a statement of the field trips taken by him. (3) The interpretation and habitual use, in the laboratory, of topographic maps, weather maps, charts, and pictures. If it is impracticable to give a full year's work to the subject, physical geography, botany, physiology, and zoology may be combined to construct units.

PHYSIOLOGY. ½ unit. Human anatomy, histology and physiology, and the essentials of hygiene. The textbook work must be illustrated by charts and models, and supplemented by anatomical demonstrations and chemical experiments.

ZOOLOGY. 1 unit . Laboratory work (at least two-thirds of the course), with careful description and drawings. Class exercises may be based on any standard textbook.

FOREIGN LANGUAGE

GREEK. 1, 2, or 3 units. First units, grammar and elementary book; second unit, Xenophon's *Anabasis,* four books; Greek composition; third unit Homer's *Illiad,* six books, or an equivalent amount of the *Odyssey;* Greek composition.

LATIN. 1, 2, 3, or 4 units. First unit, grammar and elementary book; second unit, *Caesar,* books I-IV; third or fourth units, *Cicero,* six orations (selections from the letters may be substituted for two orations); or *Virgil,* six books; composition, perferably in connection with *Caesar* and *Cicero.* These requirements are planned with special reference to the needs of those candidates who purpose continuing the study of ancient or modern languages or of history. Real equivalents will be accepted for any part of these requirements, such as Rofe and Dennison, *Latin Reader,* or Sanford-scott, *Second Latin Book.*

GERMAN. First unit. (a) Correct pronunciation; (b) grammar equivalent to Manfred's *Ein praktischer Anfang* (23 lessons), Spanhoofd's *Elementarbuch* (24 lessons or Bacon's *New German Grammar* (50 lessons); (c) about 50 pages of easy prose; (d) ability to translate from German into English and vice versa, and to answer simple German questions in German.

Second unit. (a) Fluent pronunciation; (b) elementary grammar completed; (c) about 75 of the more usual strong verbs; (d) 200 pages of reading, chiefly modern prose, but including simple poems and possibly a short play.

Third unit. (a) Further grammar and syntax study; (b) at least 200 pages of prose and verse, partly as outside reading reported on for content only; (c) constant oral and written practice.

Fourth unit. (a) At least 400 pages of standard literature in prose and verse, partly as outside reading as above; (b) increasing attention to literary appreciation and biographical and historical background; (c) ability to understand ordinary modern German texts, to write simple topics relating to them, and to converse on them in German; (d) ability to follow recitations conducted in German.

FRENCH. First unit. (a) The elements of grammar as found in the first part of usual French grammars; (b) about 100 pages of simple French, with emphasis on correct pronunciation.

SECOND unit. (a) A review of the grammar covering all the most common irregular verbs; (b) 200 pages of simple French.

Third unit. (a) At least 400 pages of French chosen from nineteenth-century classics; (b) considerable work in oral and written composition.

Fourth unit. One year of work, including: (a) at least 500 pages of classic and modern French literature; (b) ability to write a short French composition and to show understanding of a simple lecture in French by answering questions upon it in the same language.

For detailed information as to grammars, texts, etc., see *A Four-Year High-School Course in French,* copies of which may be obtained on application to the Department of French and Italian.

ITALIAN. First unit. (a) The elements of grammar; (b) 200 pages of easy Italian, with emphasis on correct pronunciation. Second unit. (a) Correct pronunciation. (b) ability to translate freely simple Italian texts; (c) an accurate knowledge of the grammatical principles of the language, and of its regular verbs; (d) about 500 pages of text.

SPANISH. First unit. (a) The elements of grammar; (b) 100 pages of easy Spanish, emphasis on correct pronunciation. The work in grammar should be approximately that found in any standard Spanish grammar. The student should be taught the Castillian pronunciation.

Second unit. (a) Correct pronunciation; (b) ability to translate freely simple Spanish texts; (c) an accurate knowledge of the grammatical principles of the language, and of its regular verbs; (d) about 300 pages of text.

Third unit. (a) At least 400 pages of Spanish chosen from nineteenth-century authors; (b) considerable work in oral and written composition.

Fourth unit. One year of work including: (a) at least 400 pages of modern Spanish literature; (b) ability to write Spanish composition and to show understanding of a simple lecture in Spanish by answering questions upon it in the same language.

For detailed information, see pamphlet entitled *A Four-Year Course in Spanish,* issued by the Department of Spanish and Portuguese.

NORSE. First unit. (a) Grammar and exercises equivalent to Holvik's *Beginner's Book in Norse,* or Michelot's *First Year Norse;* (b) 100 pages of text of the grade of Bjornson's *En Glad Gut.* Second unit. (a) A review of the grammar; (b) 200 pages of prose and verse, equivalent in grade to Holvik's *Second Book in Norse* and Ibsen's *Terje Viken.*

HEBREW. First unit. (a) Correct pronunciation and principles of Hebrew phonetics; (b) grammar, the equivalent of Harper's *Elements of Hebrew* as prescribed in Harper's *Introductory Hebrew Method and Manual,* first 25 lessons (through the regular verb); (c) reading of the first four chapters of Genesis or an equivalent amount of simple historical prose; (d) translation of simple English sentences into Hebrew. Second unit. (a) Completion of the *Elementary Hebrew Grammar* covering the irregular verbs and nouns with suffixes (completion of Harper's *Method and Manual);* (b) the reading of about 50 pages of simple Hebrew prose; (c) ability to translate into Hebrew ordinary English prose, and to read at sight historical Hebrew like the narrative portions of *Judges* or *Samuel,* when new words are given.

ART AND VOCATIONAL SUBJECTS

Owing to the present state of development of fine and applied arts and the vocational subjects in the high-school curriculum, requirements in these subjects are not defined.

AGRICULTURE. Plant production, agricultural chemistry, soils, 1 or 2; animal husbandry, 1; rural economics, farm management, and farm mechanics, 1½.

COMMERCIAL WORK. Bookkeeping, ½ to 2; shorthand, 2; typewriting, 1 if combined with shorthand, otherwise only ½; commercial arithmetic, ½; commercial law, ½; commercial geography, ½; business organization, salesmanship, and office practice, each ½ unit if taken during the last two years.

DRAWING, ART, AND DESIGN. 1-4 units. Art, to include freehand drawing, light and shade, color rendering, and perspective, 1 or 2; principles of design including application in line, form, and color, 1 or 2; crafts with correlated design, 1 or 1½.

DOMESTIC ART. Textiles and clothing, 1 or 2.

DOMESTIC SCIENCE. Food study, 1 or 2.

MANUAL ARTS. Mechanical drawing, 1-4; shop work, 1-2; freehand drawing and design, 1-2; mechanical drawing and shop, 1-4.

MUSIC

A maximum of four units of entrance credit in music may be allowed, when taken under the conditions stipulated by the University School of Music.

HISTORY AND APRECIATION OF MUSIC. 1 unit; five periods per week for one year. A non-technical presentation of those fundamentals of form and design essential for intelligent listening to music, together with a brief historical account of the development of music which will aid in giving perspective to musical understanding. The course should consist of assigned reading, prepared topics, analysis of typical examples, class projects, musical participation, and much *discriminative* listening. To conduct this course successfully, there must be available adequate reference material. Also, for purposes of musical illustration, there must be an excellent phonograph and, if possible, a player-piano, with an adequate supply of acceptable records, rolls, and scores.

THEORY AND HARMONY. 2 units only; five periods per week for two years. The course aims in the first year to provide the student with:

a) Theoretical knowledge of music symbols, terminology, intervals, key signatures, rhythms, and elementary chord structure, and a thorough knowledge of major and minor scales.

b) Ear-training, sight-singing, and dictation (laboratory work).

c) A knowledge of tone relationships with respect to rhythm, melody, harmony, and design.

In the second year the course should begin with simple triads and continue through cadences and sequences up to the dominant seventh chord. The purpose is:

a) To provide a stimulus for the creative impulses of the student, rather than to serve merely as musical grammar.

b) To develop a capacity for harmonic analysis essential for sound musicianship.

The work should consist of both paper and key-board application of all chords and progressions studied.

CHORAL MUSIC. ½ unit per year; five laboratory periods per week. This course contemplates choral study in small groups where it will be possible to pay attention to voice training and to the development of individual skill in singing. Sight-reading ability is prerequisite. The material studied must be selected from the standard choral literature and the course must be planned in such a manner that a systematic development of both skill and appreciation will result. In addition to the finished performance of typical examples of choral literature, opportunity should be provided for becoming acquainted with a wide range of the best choral literature.

ORCHESTRA. ½ unit per year; five laboratory periods per week. The basis for recognition of credit by the University is:

a) The instrumention shall be such that constructive orchestral development is possible.

b) Instructors must have had sufficient practical training to satisfactorily carry on such work.

The purpose of this course is to provide players of orchestral instruments an opportunity for the development of skill and for the enjoyment of this form of ensemble playing. It is essential, therefore, that there be an instrumentation that is sufficiently complete for the characteristic qualities of the various choirs to be realized. It is only upon this basis that an adequate performance of the literature of the symphony orchestra may be approximated.

The following minimum instrumentation is essential: four first violins, four second violins, two violas, one cello, one bass, one flute, two clarinets, one oboe, one bassoon, two trumpets (or cornets), one trombone (valve or slide), two French horns, tympani, and percussion.

In augmenting this group, the strings may first be greatly increased, with attention, however, to proportional increases in violas, cellos, and basses; then second bassoon, second oboe, second and third trombones, third and fourth French horns, and second flute may be added.

The music played by such a group may be simple but must be musically worth while. Perfect intonation, good tone, accuracy of reading, and expressive performance are the ends sought.

BAND. ½ unit per year; five laboratory periods per week. In order that credit for band may be accepted by the University, the following minimum instrumentation is necessary: eight B-flat clarinets, one flute and piccolo, one oboe, one bassoon, four cornets or trumpets, one baritone, two trombones, two tubas (preferably E-flat and BB-flat), three French horns in F or E-flat, and two percussion instruments. Instruments may be added in the following order: two B-flat clarinets, one additional French horn, one trombone, one E-flat clarinet, one alto clarinet, one bass clarinet, two trombones, and four saxophones (B-flat, E-flat, tenor, and baritone). With such an instrumentation, music of a symphonic charactor is possible. Tone, intonation, accuracy, skill in reading, and expressive performance are the ends to be attained. It should be a fundamental concept that the band is organized essentially as a musical organization rather than for utility purposes.

APPLIED MUSIC. ½ unit per year, with a maximum of 2 units; one thirty-minute private lesson per week, with one hour of practice daily.

Instruction in applied music taken for credit with teachers outside the regular school system should include: correct position with its relation to the natural production of good tone; scales and arpeggios played in rhythms in major and minor keys; sight reading; in the case of piano, pedaling; in the case of stringed instruments, bowing; the various types of touch; music chosen from the works of composers generally recognized as the best, and representing the various forms, such as march, waltz, gavotte, sonata; in the case of piano and organ, the complete cadence in all keys; correct interpretation as demanded by the pieces of various types studied.

Written application must be made in duplicate by the pupil, with the countersignature of the parent, to the principal of the high school not later than the second week of the school year, requesting permission to take applied music for a specific amount of credit with a private teacher properly accredited by the State Department of Education. When approved by the principal, one copy of the application should be signed and retained for the school office, and the other copy signed and returned to the student, who will present the approved application to the accredited private instructor when registering with such instructor for work with credit. The teacher shall submit to the principal, on a form provided by the school, a monthly report of the work done by the pupil. At the close of each semester, each pupil taking applied music for entrance credit to the University of Wisconsin shall be examined by a person selected by the principal from a list prepared by the University School of Music. The nature and the scope of each examination shall be determined by the University School of Music.

PART IV—THE COLLEGES

COLLEGE OF LETTERS AND SCIENCE

G. C. Sellery, Dean

I. COURSES OF STUDY OFFERED

The work of a student during his first two years in the College of Letters and Science is included under either the B.A. or the Ph.B. General Course or one of several special courses mentioned below and discussed in detail on the pages indicated. After completing two years in one of the General Courses the student may regularly (1) work toward either the B.A. or the Ph.B. degree in the General Course, (2) enter one of the special courses (Commerce, Journalism), (3) transfer to the School of Education as a candidate for the degree of B.S. (Education) and for the University Teachers' Certificate, or (4) work toward the B.A. or Ph.B. degree with a view to entering the Law School at the beginning of the senior year or later.

Leading to the Degree of Bachelor of Arts

General Course, page 64
Course in Commerce, page 79 (School of Commerce)
Course in Humanities, page 73
Course in Journalism, page 84 (School of Journalism)

Leading to the Degree of Bachelor of Science

Course in Chemistry, page 69
Course in Hygiene (see School of Nursing Bulletin)
Course in Pharmacy, page 75
Premedical Course, page 78

Leading to the Degree of Bachelor of Music

Course in Music, page 95 (School of Music)

Leading to the Degree of Bachelor of Philosophy

General Course, page 67
Course in Commerce, page 79 (School of Commerce)

Leading to the Degree of Graduate in Pharmacy

Three-Year Course in Pharmacy (to be discontinued in June 1934; freshmen no longer admitted)

II. GENERAL REGULATIONS

1. ADVISERS

Upon being admitted to the University, each student is assigned to a member of the faculty who acts as his adviser during the freshman and sophomore years. The duties of the adviser are to assist the student in selecting his subjects so as to secure a well-rounded education, as well as to aid him in interpreting the requirements and to oblige him to meet them in their proper sequence. The responsibility for the selection of courses rests, in the final analysis, upon the student and it is not within the province of the adviser to refuse approval of a course which the student is entitled to elect. Similarly, it is the primary duty of the student to meet the requirements of his course in their proper order, so that he may not, in his senior year, find himself unable to graduate. At the beginning of the junior year, when the student has selected his major study, an appropriate member of the division in which the major is located becomes his adviser. At the opening of each semester the student is required to consult his adviser concerning his choice of studies, and the adviser must approve the student's elections before he is permitted to enter classes.

2. CREDITS, GRADES, AND POINTS

CREDITS. The *credit* is the unit for computing the amount of work required for graduation. It is assigned to one hour of class or lecture work or to two or three hours of laboratory work per week for one semester, together with the necessary preparation. Students in the general courses are expected to earn an average of 15 credits per semester in class and laboratory work, making 30 credits per year, or 120 for the four-year course.

Each student in one of the general courses is required to take class and laboratory work in the amount of 14 to 16 credits per semester. A student who desires to elect fewer than 14 credits must obtain permission in advance from the Dean. A student who has received a grade of B in *each* subject of the preceding semester may take not to exceed 18 credits. No student will be permitted to count toward graduation more than 18 credits in one semester.

Candidates for the bachelor's degree who desire to graduate in three years may usually do so by obtaining 17 or 18 credits per semester after the first semester of the freshman year, and by attending three summer sessions. Students will need to select carefully their work for the summer with reference to the required and elective subjects of the course in which they expect to graduate. A student who expects to shorten his course in this way will necessarily consult with his adviser very carefully before selecting his subjects.

EXAMINATIONS. Each study terminates in a two-hour written final examination at the close of the semester; these final examinations are regularly scheduled, and the times set may not be changed without special faculty authorization. During the semester two or three one-hour written tests are ordinarily held in all but the most advanced courses.

GRADES AND POINTS. Semester grades are reported by letter only, although they are commonly based on averages of numerical grades in final examinations and other written work. The qualifying of letter grades by plus and minus signs is not authorized. For the sake of convenience in computing weighted averages, each letter grade carries a specified number of points per credit; thus, a B in a three-credit subject would yield 6 points. The scale of grades and points follows:

GRADE	PERCENTAGE EQUIVALENT	POINTS PER CREDIT
A (Excellent)	93–100	3
B (Good)	85–92	2
C (Fair)	77–84	1
D (Poor)	70–76	0
E (Condition)	(See Sec. 7)	0 (—½)*
F (Failure)	Below 70	0 (—1)*

POINT-CREDIT RATIO. The general quality of a student's work over a number of semesters is expressed in terms of a point-credit ratio, which is the result obtained by dividing the total number of points he has earned by the total number of credits *earned*. The highest possible quotient is 3.0, which represents a grade of A in every subject; the lowest possible quotient is zero.

The point-credit ratio must not be confused with a similar figure known as the grade-point average; this is computed at the close of each semester and is based solely on the number of points earned and credits *elected* during that semester, with deductions for deficiencies (see * above). The maximum average is 3.0, the minimum -1.0.

3. ATTENDANCE

Students are required to be present at the opening of the semester and to remain until the work of the semester is finished. It is expected that every student will be present at all of the classes at which he is due. If at any time a student is absent, he must satisfy his instructors that such absence is for good and sufficient cause. Any student who is absent from any class immediately preceding or following Thanksgiving day or the Christmas or spring recess without an excuse acceptable to the Junior Dean will be excluded from the semester examinations in those subjects from which he was absent and will be required to write special examinations as if he had received conditions. This rule also applies to absences at the opening of the second semester.

4. TRANSFERS

Students transferring from special courses, e. g., Chemistry or Premedical, or from another college of the University, to one of the General Courses, will receive no more than 15 credits a semester toward graduation for work already done, except in semesters in which all standings are B or above, when the maximum is 18 credits. They will not receive credit for technical studies of another college, except to the amount and under the conditions stated under Election of Studies Outside the College, section 18 below. Students transferring are in general required to remove an incomplete, a condition, or a failure incurred in any subject in their former college, provided they can credit the subject in question in this college. If not, the subject may be declared equivalent to a "free elective" by the Executive Committee, on application, after the student has done a semester of satisfactory work in this college. This regulation is applied similarly to transfers within this college. Doubtful cases should be referred promptly to the Executive Committee.

5. ADMISSION WITH ADVANCED STANDING

Students from accredited colleges and universities who have pursued college courses equivalent to those of the University of Wisconsin and who have been granted honorable dismissal may be admitted to this College under the following conditions:

FRESHMAN AND SOPHOMORE YEARS. Inasmuch as freshmen in this College are limited in their choice of subjects to English composition, foreign language, history, mathematics, natural sciences, and drawing, those in other institutions who

wish to receive full credit for their work by transfer here should restrict their choice accordingly. Subjects such as education, philosophy, and sociology taken during the freshman year will definitely not be credited. The minimum standard of excellence for work accepted on transfer must justify the prediction that the student will have a 1.3 point-credit ratio at the end of the sophomore year. (See second paragraph below and section 14.)

JUNIOR AND SENIOR YEARS. No student will be admitted to the junior year unless his point-credit ratio for the first two years meets the 1.3 required for promotion of University of Wisconsin students to the junior year. A correspondingly high scholastic average is requisite for admission into the senior year.

The standard of scholastic excellence expressed as a point-credit ratio of 1.3 may be regarded as the approximate equivalent of C in two-thirds of the total number of credits and B in the remaining third, on an A-B-C-D-Fail grading basis.

6. RESIDENCE REQUIREMENTS

The minimum residence requirement is 30 credits and 30 grade-points, to be earned in at least two semesters at Madison (or six summer sessions, in no one of which may less than four credits be carried). All the requirements of the major subject must be met, including at least 15 credits and 15 grade-points in advanced work at the University.

All candidates for degrees must expect to take their senior year in residence. They are not permitted to take the advanced work of the major study or the thesis in another institution or by correspondence, since these studies normally culminate in the last year of the undergraduate course. In special cases the Executive Committee of the College, on application to the Dean, may permit a senior who has finished all the specific requirements and the work of his major and thesis, to take not to exceed 6 credits by correspondence to complete the requirements for his degree.

Students who wish to earn a second baccalaureate degree in this college are required to complete the additional studies regularly prescribed for that degree, involving at least one year's additional residence and the earning of at least 30 additional credits.

7. DEFICIENCIES

FAILURES. In general, a student who has failed in any subject must remove the failure by repeating that subject in class and securing a passing grade, as soon as the subject is again offered. A failure cannot be removed by correspondence study or by repeating the subject in another institution. Students in this college, however, are required to remove failures only in required subjects, i. e., those chosen to satisfy or those capable of satisfying specific requirements for a given degree, for the teachers' certificate, for any special curriculum or course (e. g., Chemistry Course), or for a major, including also any courses which carry credit toward the major, over and above the minimum requirement thereof. So far as this regulation is concerned, a subject chosen to satisfy any requirement thereby becomes a requirement, and students may not meet the requirement in any other way, but must remove failures in such subjects unless relieved by the Executive Committee as provided in section 4 above. Seniors, including those registered for graduate credit, who incur failures during their last semester of residence must remove such failures in the regular way; this rule applies also to incompletes and conditions incurred during the final semester.

ELIGIBILITY AS AFFECTED BY FAILURES. A student who has a failure on his record shall be eligible to participate in extra-curricular activities: (a) when he shall have repeated the subject with a satisfactory grade, or (b) when he shall have satisfactorily completed, in a subsequent semester or summer session, another subject approved as a substitute by the Executive Committee, or (c) when, in case the failure is in a subject certified to the Registrar by the Dean to be a free elective, he shall have completed a subsequent semester of satisfactory work on a full program. However, to regain eligibility for intercollegiate athletics under (b) or (c) a full year of satisfactory work must be completed, as provided by the Inter-Collegiate Conference rules.

CONDITIONS. The grade of condition is given to a student who has carried a subject throughout a semester with a passing average, but who, failing in his final examination, reduces his semester average to some numerical standing between 60 and 69. A condition must be made good by passing a special examination during the student's next succeeding semester of residence at the University or it becomes a failure, which must be removed as specified above. If a student repeats in class a subject in which he has incurred a condition, he is excluded from taking the condition examination and must complete the subject in the regular way. Former students not in residence are permitted to enter condition examinations only in case they left the University in good standing. No grade points are awarded for conditions made good by examination or by special laboratory work. The student is, however, entitled to the grade which his completed work in the course finally justifies.

The usual way of removing a condition is by a successful final examination taken on the day fixed by the rules. If, however, in a course involving both laboratory and classroom work, the condition has been incurred on account of unsatisfactory laboratory or report work, it may be removed by absolving such substantial requirements as the instructor in charge of the course may prescribe. The removal of this type of condition will take effect on the official date for the removal of conditions. When a condition in such a course becomes a failure, the student may pass the course by repeating that portion of it (laboratory or classroom work) in which the condition was originally incurred, provided the instructor in charge authorizes this arrangement in advance.

INCOMPLETES. An incomplete may be given to a student who has carried a subject *successfully* until near the end of the semester and has then been compelled to quit work on account of illness or other cause beyond his control, leaving the final examination or the final examination and some limited amount of term work undone. An incomplete is not given to a student who stays away from a final examination unless he proves to the instructor that he was prevented from attending as indicated above. In default of such proof he will be failed or conditioned; even with such proof, if his term work has convinced the instructor that he cannot pass, he will be failed or conditioned. A subject marked incomplete must be completed during the student's next succeeding semester of residence at the University or it will lapse into a failure, unless the time limit has been extended in writing by the Executive Committe. A student may not graduate with an incomplete incurred during the final semester of his senior year.

8. HONORS IN SCHOLARSHIP

Sophomore honors are awarded on the basis of a minimum of two full years of work (not less than 60 credits) completed in residence in the University. A student securing during these two years 135 grade-points, plus 1.5 grade-points for each credit above 60 required in his course, will be awarded Sophomore Honors; a student securing during these two years 165 grade-points, plus 2 grade-points for each credit above 60 required in his course, will be awarded Sophomore High Honors.

Senior honors are awarded on the basis of the academic requirements ior the second half of any four-year course, all of which have been completed in residence at the University. A student securing 135 grade-points, plus 1.5 grade-points for each credit above 60 required in the second half of his course, will be awarded Senior Honors; a student securing 165 grade-points, plus 2 grade-points for each credit above 60 required in the second half of his course, will be awarded Senior High Honors. This rule will not be construed so as to bar any student from securing Senior Honors who has been permitted to carry *more* than the minimum number of credits during the first two years of his course and *less* than the minimum during the last two years.

Honors in the major may, upon recommendation of the department, be granted at graduation to any student who has done superior work in his major and who has passed with distinction a comprehensive examination on the work offered for his major. Students doing all their work in course, as well as those doing it partly in course and partly outside of course, shall, with the approval of the department, be eligible for such examination and honors.

Thesis honors are granted for an exceptionally fine or original thesis, without consideration of the student's record in other work.

The names of students awarded sophomore honors are bulletined in Bascom Hall; those of students awarded senior and thesis honors and honors in the major are published in the Commencement Register.

9. CLASSIFICATION OF STUDENTS

Rank. A student must have 25 grade-points and at least 25 credits before he may be classified as a sophomore; approximately 78 grade-points and at least 60 credits before he may be classified as a junior; and 88 grade-points and at least 88 credits before he may be classified as a senior. (See section 14 for rule governing promotion to the junior year.)

Upper and Lower Groups. At the close of the sophomore year all students in the College of Letters and Science are divided provisionally into two groups on the basis of grade-points earned during the freshman and sophomore years. Students who have a point-credit ratio of at least 1.5 by the end of the sophomore year (or at any subsequent time) are designated as upper-group students. A student's upper-group status continues throughout the remainder of his college course as long as his point-credit ratio does not fall below 1.5. At the discretion of departments, upper-group students are eligible for more advanced work than other students.

Advanced Standing. Students transferring to the University of Wisconsin from other institutions with from 45 to 90 credits shall be regarded as upper-group students after they have completed one semester of work at this University, provided their point-credit ratio for this period is not less than 1.5.

10. SPECIAL STUDENTS NOT CANDIDATES FOR A DEGREE

Under recently adopted legislation, persons who meet all the requirements for regular admission to the University, either as freshmen or with advanced standing, may apply to the Executive Committee of the College of Letters and Science for admission as "special students not candidates for a degree." Such individuals must give evidence of seriousness of purpose before their applications for admission on this basis will be approved. A student so admitted may not enter any course for which he lacks the prerequisites as published in announcements and time tables, except by special consent of the instructor therein; nor may he take part in any extra-curricular activity or join any student organization to which the eligibility rules apply. Such students will not be classified by years and will therefore not benefit by the exceptions noted under Rule 1 of the eligibility requirements, as printed in the first-semester time table.

Regular students in good standing may be permitted by the Executive Committee to transfer from a course leading to a degree to the classification of "special students not candidates for a degree."

Special students are assigned to special advisers, to whom they must give evidence of capacity and of application to their university work in order to be permitted to continue.

III. THE FIRST TWO YEARS

11. PLACEMENT AND ATTAINMENT EXAMINATIONS

When he commences his college course, each freshman is required to take a *placement* examination in English, in mathematics (if he expects to continue this subject in college), and in any foreign language which he has taken in high school and expects to continue in college. The results of these examinations determine the classes in which the student is permitted or required to enroll. If, as a result of such placement, a student should be required to repeat in college the substantial equivalent of a subject taken in high school, he would receive no college credit for such equivalent.

Any student who so desires may also take *attainment* examinations in English, history, mathematics, biology, chemistry, physics, and the foreign languages, with the object in view of proving his mastery of certain subjects required for graduation in his college course and thus of absolving the requirements altogether. Success in passing an attainment examination entitles the student to substitute some subject of his own choice for the required subject, but does not reduce the total number of credits required for graduation.

Students who will normally be candidates for the B.A. degree in June 1934 or thereafter are *required* to prove their ability in foreign language by passing attainment examinations rather than by mere accumulation of high-school units or college credits in language. (See section 24c below.)

Attainment examinations are given soon after the opening of the first semester and also near the close of each semester. Students should enroll for one or more of these examinations as soon as they are prepared, so that failure to pass may not unduly delay enrollment in required courses.

12. PHYSICAL ACTIVITY REQUIREMENT

Freshman and sophomore women are required to take three hours of physical education a week for a total of four semesters. Similarly every male freshman and sophomore is required to take three hours of work a week in either physical

education, military science, or band instruction for a total of four semesters. Normal-school graduates, students who enter with junior standing, and students who are physically disabled, as certified by the Department of Student Health, are exempt from this requirement. Freshmen and sophomores who desire exemption must make application to the proper authorities at the opening of the academic year; there are no automatic exemptions.

Students entering from schools where they have had the basic ROTC course may take the advanced course in the freshman year in fulfillment of the general option in military science, but without academic credit; or they may elect physical education or band instruction. In the sophomore year the advanced course may be elected for academic credit as well as in fulfillment of the requirement. If one of the advanced courses in military science is elected, it must appear on the student's study list in the same way as any other regular subject, and sophomores, juniors, and seniors must include it in the maximum number of credits permitted.

13. COMPLETION OF THE FIRST TWO YEARS

Freshmen and sophomores who are pursuing regular courses of study leading to a degree (excepting the Bachelor of Music degree), become candidates for the title of Junior Graduate in Liberal Studies. The title is granted upon completion of two years' work with a total of not less than 60 credits and 60 points. Some students who fail to complete the requirements for this certificate within four semesters will be permitted to return for one additional semester as sophomores on probation. Granting of the certificate of junior graduate does *not* automatically admit the recipient to the junior class.

IV. THE LAST TWO YEARS

14. PROMOTION TO THE JUNIOR YEAR

At the close of the sophomore year, students are classified according to their university records into three groups:

I—Those whose point-credit ratio for the two-year period is 1.3 or higher.

II—Those whose point-credit ratio is 1.1 but less than 1.3.

III—Those whose point-credit ratio is lower than 1.1.

Admission to the junior class will be automatic for students belonging to Class I. Students belonging to Class II may apply to the Committee on Promotion for admission to the junior year, and their applications may be supported by written recommendations from members of the teaching staff under whom the students have worked during the sophomore year. In general, students belonging to Class III will be excluded from the junior year, although the Executive Committee of the College may recommend to the Committee on Promotion the admission of those whose records during the sophomore year show a substantial improvement over their work in the freshman year.

Any student who has been refused admission to the junior year may reapply after a lapse of at least one year or after having successfully carried at least one semester of satisfactory work in another college or university. Applications will be considered on the following bases: (a) the high-school and university records of the student, (b) the record of the student since leaving the University, and (c) other relevant circumstances. Students who have been employed during a period of absence may substantiate their applications by recommendations from employers.

15. MAJOR STUDY AND THESIS

At the beginning of his junior year each candidate for a degree shall select a major study in one of the divisions* into which the College is organized and shall be assigned an adviser appropriate to the field in which he expects to concentrate. A division may refuse to accept as a major any student with less than a specified point-credit ratio in those subjects of the first two years which lie within the field of concentration, but a deficiency in the general point-credit ratio of a student who has been admitted to the junior year shall not be made a basis for refusal.

Within each division certain fields of concentration have been outlined, and special fields may be arranged for individual students with approval of the Dean. These fields may correspond to the separate departments in the division or be restricted to groups of subjects within a department, or they may include courses in more than one department. The regular fields at present authorized are announced under the separate departmental headings. (See Courses of Instruction, pages 101ff.) A few fields which cut across departmental lines or are otherwise irregular are announced below.

The general requirements of the major are as follows: (a) A maximum of 60 credits may be prescribed by the division, including not more than 40 credits within the field of concentration, and not more than 20 credits outside the field of concentration, of which as many as ten may be outside the boundaries of the division. Of these 60 credits, some may be earned during the first two years. (b) At least as many grade-points as credits must be earned in the major. (c) A thesis of 4-6 credits may be prescribed by the division, as specified in the detailed announcements of the major requirements. (d) During the last semester each candidate for a degree is required to pass a comprehensive examination covering all the work of the field of concentration. In the case of a B.A. candidate, this will include a passage of simple prose in one of the foreign languages offered for graduation.

If a thesis be prescribed by the division, it must represent a scholarly treatment of some phase of the student's work in his major study; the subject thereof requires approval by the student's adviser and the faculty member in general charge of the field of concentration (who is ordinarily the departmental chairman). The thesis shall be typewritten and bound according to specifications furnished by the University Librarian, and, after approval by the faculty member under whose guidance it has been prepared, shall be deposited in the University Library not later than the second Friday before Commencement. The thesis carries only 4-6 credits toward the requirements of the major and toward graduation.

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*The term "division" as used in this and the following sections refers to a group of affiliated departments of the college or to any single department not so affiliated. The present groupings are as follows, and all other regular departments are to be regarded as non-affiliated:

Biology—Botany, Zoology.

Language and Literature—Art History, Classics, Comparative Literature, English, French and Italian, German, Scandinavian Languages, Spanish and Portuguese.

Mathematical and Physical Sciences—Astronomy, Mathematics, Physics.

Social Sciences—Economics, History, Philosophy, Political Science, Sociology and Anthropology.

16. QUALITY OF WORK

In any course requiring 120 credits for graduation, the student, in order to absolve the academic requirements of the second half of his four-year course, must earn 60 grade-points and at least 60 credits after he has met all the requirements for admission to the junior year. (See section 14.) In other words, superior achievement in the first two years does not permit inferior achievement in the last two years. If the course requires more than 120 credits for graduation, the student must similarly earn half the total grade-points and at least half the total credits in order to absolve the requirements of the second half of the four-year course.

17. SPECIAL FIELDS OF CONCENTRATION

MEDICAL SCIENCE

A major in medical science is authorized for students in the B.A. General Course who have been pursuing the regular three-year premedical sequence and who have met the usual premedical requirements (see section 18 below). In their senior year such students register in the Medical School as well as in the College of Letters and Science. The work of the major consists of a minimum of 20 credits, including thesis, in medical subjects, of which 10 credits must be within a single department of the Medical School—ordinarily anatomy or physiology. The general requirements for the B.A. degree must be met by students pursuing this major.

The regular Course in Medical Science leading to the B.S. degree consists of two years of premedical studies followed by the first two years of the four-year course leading to the M.D. degree. Students interested in this course are referred to the bulletin of the Medical School.

The two and three-year premedical sequences appear on page 78.

BACTERIOLOGY

Students who wish to prepare themselves for positions in the field of bacteriology are permitted to offer for the B.A. or Ph.B. degree a major in biological sciences, including courses in Medical Bacteriology, Agricultural Bacteriology, and related departments. Such students should consult with Prof. P. F. Clark or Prof. W. D. Frost.

DIVISION OF LANGUAGE AND LITERATURE

The Division of Language and Literature offers the following fields of concentration:

1. Departmental fields of concentration, corresponding to the separate departments of the Division (see statements under departments concerned);

2. Inter-departmental fields of concentration, which include work in more than one department of the Division. For students exceptionally prepared in two or more foreign languages, whose plan of work cannot be adequately met within the Department of Comparative Literature, special arrangements will be made, upon application to the chairman of the Division.

Supervised Individual Reading. Students who have passed the test for either advanced or intermediate knowledge in a given language and whose general record is of considerably more than average grade, may register for additional language credit, if, in order to improve further their fluency and accuracy in the use of foreign texts, they desire to read under supervision works in the foreign language dealing with subjects related to their major field of study. The texts to be read, which should be of a general and not too technical character, will be agreed upon

in consultation between the student's major department and the language department concerned. Credit for such reading will be language credit based on an examination given by the language department and not credit in the student's major department. Arrangements for such individual reading require the approval, in advance, of the language department concerned and the Dean of the College.

HISPANIC STUDIES

Beside the advanced courses in Spanish language, literature, and civilization offered by the Department of Spanish and Portuguese, there are various other Spanish subjects in the University, making possible for the students a comprehensive preparation in the field of Hispanic studies.

Students may register for this major field of concentration at the beginning of their junior year. Prerequisites for registration are: (a) completion of all required subjects for the B.A. degree, other than foreign language; (b) Economics 1a and 1b (General economics); (c) an intermediate-knowledge examination (or, preferably, a proficiency examination) in Spanish. The following courses, although not prerequisites for registration, are recommended for election by students in the first two years to enrich their background in preparation: Geography 5-6 (Regional economic geography) or 1-2 (Elements of natural environment); History 2 (Modern European history) and 4 (History of the United States); Political Science 7 (American government and politics).

The basic courses for this major are:

	Credits
Art History 153—The age of Rembrandt and Velázquez (or cognate fields of Spanish art offered by this department)	2
Economics 151—Latin America; economic development and trade	3
Geography 102—Geography of South America	3
Geography 111—Geography of Middle America	2
Political Science 131—The United States and Latin America	3
Spanish 17 and 18—Spain and Spanish America of today	4
Spanish 21—Survey of Spanish literature	6
Spanish 102—Spanish contemporary literature	6
Spanish 126—Spanish-American literature (conducted in Spanish)	4
Spanish 150—Spanish civilization (conducted in Spanish)	2
Spanish 151—Spanish-American civilization (conducted in Spanish)	2
Total	37

If the preparation of the student warrants, some of these courses may be pursued in the sophomore year. A general knowledge of Spanish literature such as is provided in Spanish 21 will be assumed of students offering the proficiency examination in Spanish at the time of registration in the major (see c above); and therefore the 6 credits involved could be applied to electives.

Plans are under way for the establishment of other basic courses on Spanish subjects in the Department of History.

The program of electives will be flexible enough to accommodate the individual purpose of the student. Courses especially recommended for election because of their particular bearing on the major are: Geography 107 (Geography of the Mediterranean region); Geography 145 (Geography of foreign markets); Portuguese 1-2 (Elementary Portuguese). Economics 251 (Seminary, Latin-American development and trade) will be open in exceptional cases to under-

graduate students. Majors in this field will be expected to do extensive Spanish reading in connection with the courses taken in the various departments. A proficiency examination in Spanish must be passed before graduation.

For further information and registration apply to Professor Joaquín Ortega, in charge of this major field of concentration.

18. ELECTION OF STUDIES OUTSIDE THE COLLEGE

Students in any of the B.A. or Ph.B. courses are allowed to elect a maximum of 20 credits in the college and schools of the University (Agriculture, Engineering, Law, Medicine, and Education) under the conditions specified below. However, certain courses in the School of Education are counted regularly as Letters and Science subjects and so do not come under these rules.

Students in the B.S. courses may credit studies taken outside the College only if such studies are required in their respective courses.

The Schools of Commerce, Journalism, and Music and the Library School are administrative subdivisions of the College of Letters and Science. Students may elect certain studies in the first two of these (i. e., in the Departments of Economics and Journalism) without special permission; rules for enrollment in Music courses may be found on page 95 and for admission to the Library School on page 91.

GENERAL CONDITIONS

(a) The student must have completed the work of the freshman and sophomore years of the College of Letters and Science, including those studies which normally come in the freshman and sophomore years at Wisconsin. This means that a B.A. student, to enjoy the privileges of this rule, must have been promoted to the junior year and must have completed one year of English composition, one year of English literature, the science-mathematics-history requirement, and four semesters of foreign language in college unless the language requirement has been met sooner by examination. (See sections 24-26 below.) Ph.B. students must have been equally industrious in completing the requirements of their course; in particular, they must have completed their English and 20 credits in science and mathematics (requirement b), together with one of the options under requirement c. (See sections 27-29 below.)

(b) The student must be spending at least two full years in residence for the bachelor's degree. That is, studies outside the college may not be credited by students who have been granted more than two years of credit for work completed in another institution or by those whose residence work is reduced below two years by correspondence study.

(c) Certain courses, intended primarily for students of other colleges but offered by departments of the College of Letters and Science (e.g. Math. 51, Physics 51, etc.), are open in the same way as courses intended primarily for students of the College of Letters and Science.

(d) Not more than 5 of the 20 credits may be earned in either semester of the junior year.

(e) Elections must be approved by the Dean of the College of Letters and Science. Such approval will be endorsed on the study list in each case in advance, and on the student's permanent record in the Registrar's office. Courses which are parallel to Letters and Science courses will be approved only for special cause. Courses which involve a large manual or routine technical element will ordinarily be approved only as extras. Special consideration, however, will be given to programs directed to a definite educational end.

SCHOOL OF EDUCATION

The following courses are open in the same way as regular Letters and Science subjects:

Art Education 50, 51, 55—open to freshmen and others

Education 31, 41—open to sophomores and upperclassmen

Education 101, 102, 103, 112, 117, 202, 203, 204 Educational Psychology 109, 121, 123	} open to juniors and seniors only

In the summer session, courses in educational methods are also open for course credit to students in Letters and Science who wish to qualify for the State Teachers' License, but during the regular year the methods courses and Education 75 (Psychology and practice of teaching) are both definitely closed to students not actually registered in the School of Education.

LAW SCHOOL

Candidates for the B.A. or Ph.B. degree may count toward either of these degrees certain credits earned in the Law School, providing their elections outside the College have been confined to that school. If they have completely satisfied the conditions specified in paragraphs (a) and (b) above, a maximum of 26 credits may be counted. If, however, they were admitted to the Law School without having met all the specific requirements of paragraph (a), the maximum is 15 credits, and such students must earn at least 40 credits acceptable toward their degrees in residence in this college.

MEDICAL SCHOOL

Candidates for the B.A. degree are permitted to major in medical science; they may register in the Medical School in their senior year and may count toward their degree the full work of the first-year medical course, 36 credits. Such students must earn at least 90 credits in Letters and Science and meet all the regular premedical requirements (10 credits each in general chemistry, biology, and physics, 4 credits in organic chemistry, one year of college Latin or equivalent, and a reading knowledge of French or German) during the first three years. See section 16 above for requirements of major in medical science.

19. TRANSFER TO THE LAW SCHOOL; PRE-LEGAL STUDIES

Students are eligible for transfer to the Law School when they have (a) completed three academic years of satisfactory work on full programs of study (see second paragraph of section 2 above, entitled Credits and Points) in any of the B.A. or Ph.B. courses, (b) satisfied the basic requirements of the first two years in any of those courses (e. g., English composition and literature, foreign language, and the science-mathematics-history requirement in the B.A. General Course), and (c) successfully carried their third year of Letters and Science studies. In this third year students should complete all unfinished general requirements and virtually all the requirements of the major, withe the exception of the thesis.

Any major in Letters and Science, energetically carried with the general degree requirements, will furnish adequate preparation for the study of law. But the Law School Faculty believes that, as a rule, the student intending to study law should choose a field of concentration in the division of the social sciences (economics, history, philosophy, political science, sociology), and that, in any event, when he begins the study of law he should have acquired some understanding of the economic and political life of the United States and of Anglo-American constitutional history, as well as some acquaintance with philosophy and social psychology. They recommend especially the following courses: Economics 1; History 4, 5, 117, 141; Philosophy 11; Political Science 1 or 101; Sociology 46, 139. They recommend also, for their bearing on certain phases of the law: Economics 5, 19, 123, 124, 133, 137, 142; Philosophy 21, 41, 43, 136, 146; Political Science 13, 123, 125, 139, 165, 245; Sociology 161.

By availing themselves of either this section or section 18, students may earn both the undergraduate degree and the law degree in six years. Indeed, students who do not secure their arts degrees in addition to their law degrees will be at a disadvantage.

20. TRANSFER TO THE SCHOOL OF EDUCATION

See page 68 for admission requirements and for pre-education sequences.

21. UNIVERSITY TEACHERS' CERTIFICATE

The University Teachers' Certificate is not granted to students of the College of Letters and Science excepting those registered in special courses (Chemistry, Commerce, Humanities, Journalism, etc.), who may become candidates for the certificate without losing their regular status by registering in both the School of Education and the College of Letters and Science during the junior and senior years.

Students not in one of the special courses who wish to be recommended for the University Teachers' Certificate are required to transfer to the School of Education in the junior year as candidates for the degree of Bachelor of Science (Education). See page 68.

In order to qualify for the University Teachers' Certificate, special course students must meet the following requirements:

I. Completion of all the regular requirements of the special course, plus four additional credits and four grade-points (if only 120 credits are ordinarily required for graduation from that course).

II. Completion of the following professional requirements:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75—Psychology and practice of teaching	5
Departmental teachers' course	3 or 4
Elective in the Department of Education	4 or 3
	15

III. Completion of the special requirements for teaching a major subject and one or two minor subjects, as outlined under the appropriate departmental heading in the bulletin of the School of Education.

IV. Recommendation of the departments of the major and minor subjects, or the responsible authorities of the special courses, as to fitness for teaching.

V. Presentation of a certificate of physical health and fitness from the University Medical Examiner.

22. STATE TEACHERS' LICENSE

A student who wishes to become a high-school teacher without transferring to the School of Education has the privilege of fulfilling the requirements for a State Teachers' License while completing his regular work for the B.A. or Ph.B. degree. For a first license the following credits in education are *required* by the State Superintendent of Public Instruction:

	Credits
1. Educational psychology (Educ. 41)	3
2. Principles of education (Educ. 31)	3
3. *Teachers' course in major subject	2

Fifteen credits in education are required for a life certificate to teach. For the remaining seven credits the State Superintendent *recommends* the following list; part of the seven must be made up for a renewal license, and the remainder for a life certificate:

	Credits
4. *Teachers' course in minor subject	2
5. History of education	3
6. Educational measurements	2

More specific information may be obtained from the office of the State Superintendent of Public Instruction or from the office of the Dean of the School of Education.

Attention is called to the fact that the minimum requirement to teach in a high school which is a member of the North Central Association of Colleges and Secondary Schools is fifteen hours in education.

23. ADVANCED INDEPENDENT WORK

A student whose point-credit ratio for the first two years is not less than 2.5 and who is recommended by three of his sophomore instructors, may be permitted by the major division of his choice to pursue his major study independently of class work. At the close of the senior year such a student, provided he has met all the requirements outside the major, shall be tested on this independent work by the submission of a thesis and by a comprehensive examination in the major, covering subjects agreed upon at the inception of the independent work. If the thesis and examination are satisfactory, the student shall be granted the maximum number of credits allowed for the field of concentration selected, and grade-points shall be assigned according to the quality of the work.

Upon recommendation of the division and upon approval by the Graduate Office of work done on the thesis, such a student may be admitted to the Graduate School at the end of the seventh semester, thereby becoming subject to its regulations and eligible to its scholarships. The student who, at the close of the eighth semester, has met the general requirements outside the major, has passed the comprehensive examination, has had his completed thesis approved by a committee of three appointed by the Graduate Office, and is recommended by the division and the Graduate School, shall be granted the bachelor's degree (as of the close of the seventh semester) and the master's degree. If all other requirements have been met but the thesis has not been completed, the student shall be granted only the bachelor's degree, and the master's degree shall be withheld until the successful completion of the thesis.

*Available only in the Summer Session.

A student in a special course which requires more than 120 credits for graduation may follow this procedure in nine rather than in eight semesters, in which case the requirements of the ninth semester shall be those stated above for the eighth semester.

A student who is registered for advanced independent work and who fails to pass with distinction the general examination at the close of his senior year may nevertheless be recommended by his examining committee for the bachelor's degree.

V. THE B.A. GENERAL COURSE

24. OUTLINE OF CURRICULUM

(a) ENGLISH: 10 or 12 credits, as follows: 6 credits in freshman composition; 4 or 6 credits in sophomore literature (English 29, 30, or 33). Students earning a grade of A in the first semester of the composition course may, if they so desire, omit the second semester of it. On the completion of English 1 a provisional pass mark is given; if at any time later in his course a student is reported as deficient or careless in English composition he may be required to take additional work in that subject.

(b) SCIENCE-MATHEMATICS-HISTORY: Two of the following: natural science, 10 credits, *in a continuous year course;* mathematics, 8 credits; history, 6 credits, *in a continuous year course.* If the student has had no history or no science in high school, he is expected to take a year course in the subject lacking. A student is not permitted to repeat in college, for credit, the equivalent of a course in mathematics which he has had in high school.

Under continuous year courses in natural science are included botany, zoology, biology (a combined course made up of a semester of botany and a semester of zoology), chemistry, physics, geography, and geology. All are courses of five credits per semester for two semesters, with laboratory work, or field work in geography and geology.

The natural science option may also be satisfied by taking a minimum of 10 credits in elementary science surveys, which are semester courses less specialized or professional than the continuous year courses mentioned above. These surveys, which are offered in astronomy, botany, chemistry, geology, physiology, physics, and zoology, involve either laboratory or field work and carry three or four credits each. (See section 25 below.) The student is not permitted to split the natural science option, i. e., to take one semester of a year course and two survey courses; he must present 10 credits in either one or the other.

(c) FOREIGN LANGUAGE.—I. NEW REQUIREMENT. Students who will normally be candidates for the degree in June 1934 or thereafter must pass attainment examinations which shall prove either (1) *proficiency,* i. e., advanced knowledge, in one foreign language, ancient or modern, or (2) *intermediate knowledge,* i. e., reading knowledge, in two languages. Foreign languages studied in high school are accepted only in fulfillment of entrance requirements; credits in foreign language earned in college (either at Wisconsin or elsewhere) are accepted only as electives toward the 120 credits required for graduation.

The test for *proficiency* in a language presupposes adequate preparation based on the equivalent of four years' study of that language in college (e. g., four years in high school and two in college, or two years in high school and three in college,

etc.); the test for *intermediate knowledge* is based on approximately half this amount of preparation. Superior students with less than this amount of study and those who have lived abroad or who have acquired a knowledge of foreign language in some other way are encouraged to take the examination. (See calendar for dates on which attainment examnations are held.)

Proficiency in a modern language shall be shown by demonstrating (a) adequate comprehension of representative passages from classic and modern authors, which may include matter taken from the student's major field, (b) the ability to understand and pronounce simple phrases in the spoken language, and (c) some knowledge of the history of the literature and culture of the foreign people. *Proficiency in Greek or Latin* shall be shown by demonstrating (a) the ability to translate into idiomatic English representative passages of prose and poetry from the fields of the student's previous reading, which shall be substantially equivalent to the satisfactory completion of four years of the language in high school and four semesters in the University, or a similar amount differently distributed, (b) some knowledge of each author's work as a whole and of its historical and cultural background, (c) the ability to translate English sentences involving the common grammatical constructions into Greek or Latin prose.

Intermediate knowledge in a modern language shall be shown by a test involving the ability to pronounce the modern language and to interpret, adequately, modern prose of average difficulty. *Intermediate knowledge in Greek or Latin* shall be shown by demonstrating the ability to translate adequately and explain the grammatical constructions in passages of average difficulty chosen from such portions of at least three Greek or Latin authors as are usually read in high school or college.

Students entering from foreign countries where they have studied English as a foreign language in recognized secondary schools or colleges, may be allowed not more than four entrance units for their work in English (and, of course, as partial fulfillment of the foreign language required for graduation). Such students, including those entering with advanced standing, will take the preliminary tests in freshman English administered at the beginning of each semester, and those who fail to pass these tests must take work in sub-freshman English. Those presenting English to meet the foreign-language requirement for graduation must pass examinations for intermediate knowledge both in English and in one foreign language other than their mother tongue.

II. Old Requirement. Students who will normally be candidates for the degree prior to June 1934 must earn 32 credits in one, two, or three of the foreign languages specified below; these credits may have been earned partly in high school and partly in the University, or wholly in the University. The rate at which such high-school work is accepted is four university credits for one unit, up to a maximum of six units or 24 credits. A student is not permitted to repeat in college, for credit, the equivalent of a course in foreign language which he has had in high school. Only French, German, Classical Greek, Hebrew, Italian, Latin, Norse, and Spanish may be offered for entrance; these languages and, in addition, Polish and Portuguese, may also be offered for graduation, although Hebrew and Polish are not taught in the University at present. Eight is the minimum number of credits in a single language which will be accepted in fulfillment of this requirement, and if two or three languages are presented at least 16 credits must be in one language. In general, students are required to take a minimum of 8 credits in one foreign language in college.

(d) Major Study and Electives to total 120 credits. (See section 15 above.)

25. STUDIES OF THE FRESHMAN YEAR

Only one subject is definitely required of all first-year students, viz., English 1 (freshman composition), three credits per semester. Those freshmen, however, who are successful in the attainment examination in English may substitute English 3 (intermediate composition), two credits per semester, or English 29 (English history and English literature), five credits per semester. This latter course gives two credits in English and three in history.

The other subjects, sufficient to make up a program of 14, 15, or 16 credits for the semester, are to be chosen from the groups listed below, composed of subjects which extend for two semesters, unless otherwise indicated.

GROUP I. SCIENCE-MATHEMATICS-HISTORY

At least one subject must be chosen from this group, but not more than five credits per semester may be taken in any single subject.

SCIENCE—Continuous year courses:

Biology 1—five credits (Botany 1 in the first semester, followed by Zoology 1 in the second semester, or Zoology 1 followed by Botany 1)
Botany 1, 2—five credits per semester
Chemistry 1—five credits per semester
Geography 1, 2—five credits per semester
Geology 1—five credits per semester
Physics 1 or 31—five credits per semester
Zoology 1, 2—five credits per semester

SCIENCE—Elementary survey courses:

Astronomy 17—three credits, second semester
Botany 17—three credits, second semester
Chemistry 17—three credits, second semester
Geology 17—three credits, second semester
Physiology 17—four credits, first semester
Physics 17—four credits, first semester
Zoology 17—three credits, first semester

MATHEMATICS—Semester courses repeated each semester:

Mathematics 1 (college algebra)—four credits
Mathematics 2 (trigonometry and analytic geometry)—four credits
Mathematics 3 (analytic geometry)—three credits
Mathematics 7 (theory of investment)—four credits

HISTORY—Continuous year courses:

History 1 (medieval)—three credits per semester
History 2 (European)—three credits per semester
History 5 (English)—three credits per semester
History 29 (combined course in English history and English literature)—three credits per semester in history, two in English

Students may earn five credits per semester in freshman history by taking two of the following courses: History 1, 2, and 5. In this case they will do the full work of one course, receiving three credits; in the other course they will omit much of the collateral reading and the reports, and will receive two credits. If only one of these courses is taken, it must be for three credits.

GROUP II. FOREIGN LANGUAGE

Normally each student is required to pursue one foreign language during his freshman year in preparation for his attainment examination in that language. Exceptions are made, of course, in the case of those students who may have been able to satisfy the foreign-language requirement completely at the outset. See paragraph (c) above.

The languages at present available include French, German, Classical Greek, Italian, Latin, Norse, Portuguese, and Spanish. The number of credits per semester varies from three to five, depending on the language selected and the degree of advancement of the student; beginning courses carry four credits each, with the exception of Latin, which carries five.

A student who continues in college a foreign language which he has studied in high school is assigned to a class on the basis of a placement test (see section 11) and is subject to promotion or demotion at the end of the first few weeks as determined by the quality of his classwork; a second test may then be given if the student should be dissatisfied with his placement.

Credits earned in foreign language will count only as electives toward the 120 required for graduation; no credit whatsoever will be given for college courses which are substantially equivalent to those completed in high school.

GROUP III. FREE ELECTIVES

DRAWING:

Drawing 1, 2 (mechanical)—three credits per semester
Art Education 50, 51 (freehand)—three credits per semester

26. STUDIES OF THE SOPHOMORE YEAR

In the sophomore year the student must continue his English for two semesters, as well as his foreign language, unless these requirements have already been met; likewise his history, mathematics, or science, unless this group requirement has been absolved in his freshman year, together with additional Letters and Science courses necessary for a program of 14 to 16 credits.

VI. THE PH.B. GENERAL COURSE

27. OUTLINE OF CURRICULUM

(a) English: 6 credits in freshman composition are required of all (see section 24a); in addition, 4 credits in intermediate composition are required of all *excepting* those who fulfill option 3 under (c) below or who have completed successfully one year of foreign language in college.

(b) Science and mathematics: A total of 20 credits to be taken in year courses; e. g., 8 credits in mathematics and 12 in science, or 10 credits in mathematics and 10 in science, or 20 in mathematics, or 20 in science. Only the continuous year courses in science approved for the B.A. course will be accepted as meeting this requirement. (See section 25, group I.)

(c) Two of the following groups:

1. Philosophy and psychology; or mathematics—10 credits in one of the two. Mathematics may not be offered both here and under (b) above.
2. History, 10 credits, to be taken in year courses, excepting that courses in the "hundred" group may be credited by semesters.
3. Intermediate knowledge in one foreign language, as disclosed by an attainment examination (see section 24c).

(d) Major study and electives to total 120 credits. See section 15 above.

28. STUDIES OF THE FRESHMAN YEAR

The subjects of the B.A. course, with the exception of elementary science surveys, are open to freshmen in this course, and on the same terms. (See section 25.)

29. STUDIES OF THE SOPHOMORE YEAR

The study list for the sophomore year must include English 2, intermediate composition, two credits each semester, unless the student has passed an attainment examination for reading knowledge in one foreign language or has completed successfully one year of foreign language in college. The study list must also include whatever subjects are necessary in order to complete the science-mathematics option and the history option commenced in the freshman year. If the philosophy and psychology option is chosen, work on it should commence during the sophomore year. In the event the foreign-language option has been met by examination, the student should have about twelve credits of free electives each semester of this year.

VII. EXPERIMENTAL COLLEGE

The Experimental College, as authorized by votes of the Faculties and the Regents of the University, ceases to exist at the close of the academic year 1931-32. Proposals for the establishment of analogous colleges for freshmen and sophomores are under consideration, but the plans are as yet too undeveloped and too uncertain for statement in this Announcement.

VIII. TRANSFER TO THE SCHOOL OF EDUCATION

Students desiring to major in Art Education or in Physical Education will register in the School of Education at the beginning of the freshman year; those desiring to pursue a teaching major in an academic subject will ordinarily transfer to the School of Education, as specified herein. See also sections 21-22, pages 62-63.

Students are eligible for transfer to the School of Education when they have satisfactorily completed the regular requirements of the first two years of one of the General Courses, as contemplated in section 18, paragraph (a), above. However, no student will be accepted into the School of Education unless his scholastic record is sufficiently high to indicate the probability of success in some teaching field. Applicants for transfer are also required to present evidence of proficiency in speech in the form of either (a) a rating by the Speech Examination Committee of the School of Education, or (b) a grade in one of the introductory speech courses, 1 or 7.

Students who expect to enter the School of Education are advised to adapt the requirements of the first two years of one of the General Courses to the requirements for graduation from the School of Education, in order to obviate the necessity of spending more than four years in earning the B.S. (Education) degree. Any one of the four special sequences listed below will serve to accomplish this purpose; numbers I and III fulfill the Ph.B. requirements and numbers II and IV the B.A. requirements. Before transfer to the School of Education can be approved, substantial progress toward completion of the general requirements and the selected pre-education sequence must be made. The work of the first two years should include one or more courses in the field in which the student expects to pursue a teaching major.

PRE-EDUCATION SEQUENCES

Students who expect to transfer to the School of Education should select one of the following sequences:

SEQUENCE I

A. No foreign language required.
B. Required: English composition, 10 cr. (English 1 and 2); history, 10 cr.†; social sciences, 6 cr.‡; mathematics or philosophy, 10 cr.; natural science, 20 cr.* in regular year courses.

SEQUENCE II

A. Required: Intermediate knowledge of one language.
B. Required: English literature, 4-6 cr.; English composition, 6 cr.; history, 6 cr.†; social sciences, 6 cr.‡; mathematics, 8 cr. or philosophy, 6 cr.; natural science, 10 cr.* in elementary survey courses or 15 cr.* in regular year courses.

SEQUENCE III

A. Required: Intermediate knowledge of one language.
B. No English literature required. Required: English composition, 6 cr.; history, 6 or 10 cr.†; social sciences, 6 cr.‡; mathematics 10 or 8 cr. or philosophy 10 or 6 cr.; natural science, 20 cr.* in regular year courses.

SEQUENCE IV

A. Required: Proficiency in one foreign language, or intermediate knowledge in two foreign languages, or intermediate knowledge in one foreign language plus 10 cr. in literature courses in that language.
B. Required: English composition, 6 cr.; English literature, 4-6 cr.; two of the following: (a) history, 6 cr.† and social sciences, 6 cr.‡; (b) mathematics, 8 cr.; (c) natural science, 10 cr.* in elementary survey courses or 15 cr.* in regular year courses.

IX. COURSE IN CHEMISTRY

J. H. MATHEWS, DIRECTOR, PROFESSOR OF CHEMISTRY

The purpose of the Course in Chemistry is to train competent chemists for industrial, governmental, and teaching positions. The United States is a leading nation in chemical industries and our continued industrial success is largely dependent on the ability of our universities to supply the demand for men with adequate chemical training. Many industries are essentially chemical in character and have long employed chemists; others, because of the necessity of meeting changing conditions and keener competition, are finding it increasingly necessary to employ chemists to originate, simplify, and control plant processes. Chemical control and research are necessary in practically every industry.

The principal departmental bureaus of the Government employ a considerable number of chemists, both for research and control work. All of the larger cities require skilled chemists, as do many of the various state commissions and the federal and state experiment stations. The development of agriculture is largely dependent on the services of the chemist, and trained workers are in great demand in this field. Many industries are establishing central experimental and research laboratories for the intensive study of the specific problems relat-

*Must include 5 cr. in biology, preferably zoology, and 5 cr. in a non-biological science.
†Must include a year course in European or American history.
‡Must include Political Science 1 or 7 (3 cr.) and economics or sociology (3 cr.).

ing to those industries. Positions in those laboratories are most desirable, as they afford specialized training which leads to the attainment of exceptionally lucrative positions. Research laboratories are being established for a great variety of purposes, and these laboratories must ever look to the universities for trained chemists. For these positions, especially, it is highly desirable that the four-year course in chemistry be followed by from one to three years of graduate work. The demand for the exceptionally well-trained man is steadily increasing and, whenever it is possible, the student who shows an aptitude for chemistry should plan for graduate training.

The thoroughly trained teacher of chemistry has an exceptional opportunity to play an important role in the social, economic, and industrial development of the nation. His opportunities to aid in the dissemination of useful knowledge, in the development of a wider appreciation of scientific knowledge, and to contribute to scientific progress both by his teaching and his opportunity for personal research, are such as to make this profession unusually attractive to those who have a sincere desire to serve their fellow men.

The curriculum of the Course in Chemistry is designed to offer a broad foundation in the chemical and related sciences. It does not profess to train chemists for special industries, for each industry has its special problems and special methods. Interwoven with the courses in chemistry are courses designed to broaden the understanding and to round out educational training. Several electives are provided, and it is required that a certain number of these be studies other than chemistry. Students are expected to take a sufficient number of cultural studies to acquire the proper educational balance.

Three options are offered: A general option, an option for industrial chemists, and an option for food or sanitary chemists. Attention is called to the fact that specialized training along the lines of soil chemistry and physiological chemistry may be obtained by election of courses in these subjects along with the required studies of the general course.

Requirements. Students having the entrance requirements prescribed for the College of Letters and Science may be admitted to this course. It will be observed from the outline of the curriculum below that the work of the freshman year is identical in each of the three fields of study, and in all of them a year each of general inorganic, analytical, organic, and physical chemistry is required. The course in English is the composition course required of all freshmen in the University. The equivalent of at least courses 2a and 2b in German and courses 1a and 1b in French is required for graduation from the Course in Chemistry, but high-school work in these languages may satisfy the graduation requirement in part. A student entering with preparation in but one of these languages will naturally continue work in it during the freshman year.

In each of the options, 130 credits are required for graduation. Students will frequently find it desirable to absolve a part of the requirements during one or more summer sessions. The work of the senior year includes the writing of a thesis, embodying the results of a detailed experimental investigation.

Each year at least one opportunity for an extended industrial trip will be offered. The Middle West has become an important center of chemical industries, and nearly all of the more important of them may be seen in operation here. It is expected that the students taking the Course in Chemistry will avail themselves fully of these opportunities to visit representative industrial plants. At least one such trip must be taken during the course. While it is not specifically required for graduation, students are urged to devote at least one of their summer vacation periods to practical chemical work in some chemical industry.

COURSE IN CHEMISTRY

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (CHEMISTRY)

ALL OPTIONS

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Chem. 1a—General chemistry	5	Chem. 1b—General chemistry and qualitative analysis	5
Math. 1—College algebra	4	Math. 2—Trigonometry and analytic geometry	4
German or French	4	German or French	4
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Physical activity requirement	0	Physical activity requirement	0
	16		16

GENERAL OPTION

SOPHOMORE YEAR

If Math. 5a be taken in the first semester, it should be followed by Math. 5b in the second; if Chem. 10 be taken in the first semester, it should be followed by Math. 5a in the second.

Chem. 11a—Quantitative analysis	5	Chem. 11b—Quantitative analysis	5
German or French	4	German or French	4
Physics 31—General physics	5	Physics 31—General physics	5
Math. 5a—Differential calculus, or	3	Math. 5b—Integral calculus, or	3
Chem. 10—Mathematical chemistry	(3)	Elective	(3)
Physical activity requirement	0	Physical activity requirement	0
	17		17

JUNIOR YEAR

Chem. 120, 121—Organic chemistry	5	Chem. 120, 121—Organic chemistry	5
Chem. 130, 131—Physical chemistry	5	Chem. 130, 131—Physical chemistry	5
German or French	4	German or French	4
Elective	3	Elective	3
	17		17

SENIOR YEAR

Chem. 100—Thesis	3	Chem. 100—Thesis	3
Chem. 119—Organic analysis	3	Chem. Engr. 15—Industrial organic chemistry	2
Chem. 107—History of chemistry	2	Agr. Bact. 2—Survey of bacteriology	4
Chem. Engr. 15—Industrial chemistry	3	Electives	6
Electives	4		
	15		15

Of the 18 elective credits, at least 10 must be taken in subjects other than chemistry.

OPTION FOR INDUSTRIAL CHEMIST

SOPHOMORE YEAR

Same as for sophomore year of General Option except that mineralogy, metallurgy, or calculus may be elected.

JUNIOR YEAR

Same as for junior year of General Option

SENIOR YEAR

Chem. 100—Thesis	3	Chem. 100—Thesis	3
Chem. Engr. 15—Industrial chemistry	3	Chem. Engr. 15—Industrial organic chemistry	2
Chem. Engr. 23—Manufacturing equipment	2	Chemical Engineering electives	4
Electives	7	Electives	6
	15		15

OPTION FOR FOOD CHEMIST OR SANITARY CHEMIST

SOPHOMORE YEAR

Chem. 11a—Quantitative analysis	3	Chem. 11b—Quantitative analysis	3
German or French	4	German or French	4
Physics 31—General physics	5	Physics 31—General physics	5
Agr. Bact. 1—Survey of bacteriology	5	Botany 1—General botany	5
Physical activity requirement	0	Physical activity requirement	0
	17		17

JUNIOR YEAR

German or French	4	German or French	4
Chem. 120, 121—Organic chemistry	5	Chem. 120, 121—Organic chemistry	5
Chem. 119—Organic analysis	3	Chem. 146, 147—Chemistry of foods	5
Elective	5	Elective	3
	17		17

SENIOR YEAR

Chem. 100—Thesis	3	Chem. 100—Thesis	3
Chem. 130, 131—Physical chemistry	5	Chem. 130, 131—Physical chemistry	5
Chem. 107—History of chemistry	2	Chem. 113—Water analysis	1
Agricultural bacteriology	3	Electives	6
Elective	2		
	15		15

Of the 15 elective credits, at least 8 must be taken in subjects other than chemistry.

X. COURSE IN HUMANITIES

COMMITTEE IN CHARGE: PROFESSORS FISH (chairman), DODGE, MORGAN, F. C. SHARP, WAGNER, WINSPEAR, ZDANOWICZ.

PURPOSE AND PLAN. This course was instituted in 1920 in order to give students substantial introductions to the four great fields of learning: language and literature; history and its correlated branches; science; philosophy and mathematics. They will come into vital contact with at least one of the great civilizations of the ancient world. They will acquire the power to acquaint themselves with at least one of the great foreign civilizations of the modern world. They will have training in English composition and spend at least a year with the masters of English literature. They will be given the opportunity in courses in history, economics, and political science to gain knowledge regarding the institutions of the past and of the present, and to study methods of analyzing social facts. An introduction to one of the sciences will open to them the world of natural phenomena, and bring to them some experience in scientific method. Courses in philosophy and mathematics will serve to induce in them habits of close reasoning.

It is believed that students who seek what is called a "general education" will see the desirability of the initiation into these four fields which is required in the new course. It is believed, also, that students who feel the need of passing quickly to a special subject with the intention of concentrating their attention upon it will consider that the delay entailed by the satisfaction of the requirements in the new course will be justified by the enlarged vision with which it will insure their entering upon their specialized work.

REQUIREMENTS. The general requirements of this course are identical with those of the B.A. General Course and the regulations pertaining thereto also govern students in this course, excepting as modified by the following special requirements and rules. (See pages 49-67.) The major must be chosen from the fields of language, literature, natural science, economics, history, political science, mathematics, or philosophy. Professional subjects, excepting such as may be required for the teachers' certificate, are not open for election by students in this course. Some member of the committee in charge will be assigned as the student's adviser and will inform him whether or not any given subject is professional. Upon successful completion of the requirements outlined below, including 120 academic credits and at least an equal number of grade-points, the student will be admitted to the degree of Bachelor of Arts (Humanities).

The student will meet the following special requirements:

(a) 12 credits in English composition and literature;

(b) three of the following four options in foreign language and literature: (1) 24 credits in Latin, (2) 14 credits in Greek—to be absolved by combining high-school units and college credits as described in section 24 (c) II, page 65; (3) a reading knowledge of French, (4) a reading knowledge of German—as demonstrated to the satisfaction of the committee in charge. (These requirements must not be confused with the regular attainment examinations specified for the B.A. General Course.)

(c) 10 credits in the field of economics, history, and political science, of which at least 6 credits will be in history (freshmen will ordinarily elect 8 credits in medieval history);

(d) 10 credits in natural science;

(e) 12 credits in the field of mathematics and philosophy. Elections in philosophy shall be made after consultation with the chairman or the secretary of the Course in Humanities.

COURSE IN HUMANITIES

LEADING TO THE DEGREE OF BACHELOR OF ARTS (HUMANITIES)

RECOMMENDED SEQUENCE

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Hist. 1—Medieval history	4	Hist. 1—Medieval history	4
Foreign language	3-5	Foreign language	3-5
Mathematics or foreign language	3-4	Mathematics or foreign language	3-4
Physical activity requirement	0	Physical activity requirement	0
	14-16		14-16

SOPHOMORE YEAR

Engl. 30a—General survey of literature	3	Engl. 30b—General survey of literature	3
Foreign language	3-5	Foreign language	3-5
Science	5	Science	5
Required subject (see list below)	3-4	Required subject (see list below)	3-4
Physical activity requirement	0	Physical activity requirement	0
	14-17		14-17

SUBJECTS RECOMMENDED FOR SOPHOMORE YEAR IN FULFILLMENT OF REQUIREMENTS

Econ. 1a—General economics	4	Econ. 1b—General economics	4
Pol. Sci. 1—Introduction to government and politics	3	Philosophy 11, 21, or 132	3
Philosophy 11, 21, 31, or 41	3	Pol. Sci. 1—Introduction to government and politics	3
Psych. 1—Introductory psychology	3	Psych. 1—Introductory psychology	3
Math. 5a—Differential calculus	3	Math. 5b—Integral calculus	3

XI. COURSE IN PHARMACY

EDWARD KREMERS, DIRECTOR, PROFESSOR OF PHARMACEUTICAL CHEMISTRY

The purpose of the Course in Pharmacy is to furnish a scientific foundation for the pursuit of the profession of pharmacy in all its branches; to prepare students not only to operate drug stores but to fit them as well for other lines of pharmaceutical activity,—to enter hospital practice, to take up pharmaceutical manufacturing, to engage in pharmaceutical research and the teachiing of pharmaceutical subjects, or to enter the government service.

Beginning with the academic year 1932-1933, a minimum four-year course will be offered, requiring 120 credits for graduation. Those who entered the three-year course in 1930 and 1931 will be carried through to graduation if they pursue the course without serious interruption, but no new students will be accepted in the three-year course.

The Course in Pharmacy is designed to provide a broad foundation in pharmacy and the related sciences. To this end the first two years are devoted almost exclusively to the study of languages and the fundamental sciences. Year courses in English, biology, chemistry, and physics are required. Since the ability to read foreign languages, especially French and German, is demanded for any advanced work in science, a reading knowledge of these two languages is required.

All of the strictly pharmaceutical subjects, with the exception of an orientation course in the first year and an elementary course in prescription practice in the second, are given in the last two years of the course. These include pharmaceutical and plant chemistry, pharmacognosy, and pharmacy. A thesis is required.

ADVANCED WORK. Like the sister profession, medicine, pharmacy is in need not only of the general practitioner, but also of the specialist. For the preparation necessary to equip such specialists the University offers graduate courses. Accordingly, the graduate courses in pharmacy make up an important part of the work of the department, advanced courses and research facilities in pharmacy, pharmaceutical and plant chemistry, and pharmacognosy being provided. Graduates who desire to prepare themselves as chemists for manufacturing establishments, as analytical, food, or sanitary chemists, or as bacteriologists will find that the graduate work in pharmacy, not less than in other departments of the University, offers excellent opportunities for specialized study and research.

LABORATORIES. The pharmaceutical laboratories are located on the third and fourth floors of the Chemistry Building. On the third floor they consist of a dispensary and laboratories for pharmaceutical technique, practical pharmacy, pharmaceutical and plant chemistry, and a research laboratory. On the fourth floor are located the Frederick B. Power Pharmaceutical Library, the drug cabinet, the milling room, a laboratory for extraction and distillation purposes, equipped with steam and vacuum apparatus, a laboratory for the study of pharmacognosy, and a research laboratory.

COURSE IN PHARMACY

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (PHARMACY)

THE FIRST TWO YEARS

	Credits
English 1—Freshman composition	6
Biology 1—General biology (including elementary botany)	10
Chemistry 1—General chemistry and qualitative analysis	10
Physics 1 or 31—General physics	10
Pharmacy 1—Orientation in pharmacy	6
Pharmacy 20—Elementary prescription practice	4
French—Reading knowledge	0–14
German—Reading knowledge	14–0
Physical activity requirement (four semesters)	0
	60

THE LAST TWO YEARS

Botany 110, 111—Pharmaceutical botany	6
Pharm. Chem. 26, 27—Organic and inorganic pharmaceutical chemistry	10
Pharm. Chem. 45—Pharmaceutical assaying	4
Pharm. Chem. 40—Plant chemistry	6
Pharmacognosy 10—Crude vegetable and animal drugs	2
Pharmacognsy 120—Natural history of drugs	6
Pharmacy 30—Pharmaceutical technology	5
Pharmacy 121—Advanced prescription practice	2
Pharmacy 51—Drug-store practice	2
Pharmacy 50—History of pharmacy	2
Thesis	4
Electives	11
	60

WISCONSIN PHARMACEUTICAL RESEARCH FUND

Recognizing the growing importance of research to the science and art of pharmacy, the pharmaceutical alumni and other friends of the University have established a fund, known as the Wisconsin Pharmaceutical Research Fund of the University of Wisconsin. The first contributions to this fund, amounting to $1000, were presented in June, 1917, and accepted by the Regents in the name of the University. Since 1917, by gifts and accrued interest, the fund has increased until it now totals more than $10,000. Half of the income of this fund may be devoted directly to pharmaceutical research while the remainder goes to augment the principal. Thus a permanent and ever-increasing endowment for pharmaceutical research at the University of Wisconsin is assured.

PHARMACEUTICAL EXPERIMENT STATION

In accordance with an act passed by the legislature in 1913, a Pharmaceutical Experiment Station has been established in connection with the Department of Pharmacy. The object of the Station, as outlined by the law establishing it, is two-fold:

(1) To coöperate with the Bureau of Plant Industry of the Department of Agriculture in the maintenance of the northern station for the cultivation of medicinal plants and to desseminate such information as may lead to the proper cultivation of medicinal plants and the production of high-grade vegetable drugs in this state; and

(2) To serve the public at large by coöperation with both pharmacists and physicians in securing for the sick the best medicines that pharmaceutical science and art can provide, and further, by coöperation with the State Board of Pharmacy, the State Board of Health, and the Dairy and Food Commission, to bring about these results.

The staff of the Experiment Station is made up of members of the faculty of the Department of Pharmacy. A garden of about forty acres for the scientific cultivation of medicinal plants and a laboratory for the investigation of problems connected with the preparation and testing of crude drugs, pharmaceutical preparations, and chemicals are maintained. Reports on the work of the Experiment Station are published from time to time and distributed to persons interested. For copies of these reports application should be made to the Director.

XII. PREMEDICAL CURRICULA

RECOMMENDED SEQUENCE FOR THE THREE-YEAR COURSE

LEADING EVENTUALLY TO THE DEGREE OF BACHELOR OF ARTS

(See section 17, page 58)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
French 1a or German 1a	4	French 1b or German 1b	4
History or mathematics	3-4	History or mathematics	3-4
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

SOPHOMORE YEAR

Engl. 30a or 33a—Literature	3-2	Engl. 30b or 33b—Literature	3-2
Chem. 20, 21, or 120, 121—Organic chem.	4-5	Zoology 2 or 104	5
Zoology 1—Animal biology	5	French 10b or German 2b	3
French 10a or German 2a	3	Elective	5
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

JUNIOR YEAR

Physics 1 or 31	5	Physics 1 or 31	5
Foreign language	4-5	Foreign language	4-5
Latin 1—Elementary Latin	5	Latin 2—Caesar	5
Electives if foreign language and Latin were pursued in high school	(10)	Electives if foreign language and Latin were pursued in high school	(10)
	14-15		14-15

RECOMMENDED SEQUENCE FOR THE TWO-YEAR COURSE

LEADING EVENTUALLY TO THE DEGREE OF BACHELOR OF SCIENCE (MEDICAL SCIENCE)

FRESHMAN YEAR

Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Physics 1 or 31—General physics	5	Physics 1 or 31—General physics	5
French 1a or German 1a	4	French 1b or German 1b	4
Physical activity requirement	0	Physical activity requirement	0
	17		17

SOPHOMORE YEAR

Chem. 20, 21 or 120, 121—Organic chem.	4-5	Zoology 2 or 104	5
Zoology 1—Animal biology	5	French 10b or German 2b	3
French 10a or German 2a	3	Latin 2—Caesar	5
Latin 1—Elementary Latin	5	Elective if Latin was taken in high school	(5-6)
Elective if Latin was taken in high school	(4-3)	Free elective	3-2
Physical activity requirement	0	Physical activity requirement	0
	16-18		15-16

SCHOOL OF COMMERCE

CHESTER LLOYD JONES, DIRECTOR, PROFESSOR OF ECONOMICS

The School of Commerce of the University of Wisconsin, organized in September 1900, offers a three-year curriculum including junior, senior, and graduate years.

REQUIREMENTS FOR ADMISSION

Students in either of the General Courses (B.A. or Ph.B.) in the College of Letters and Science who have been regularly promoted to the junior year (see section 14, page 56) are eligible for admission to this School. The work of the first two years must include eight credits in general economics (Economics 1a and 1b); it should also include Mathematics 7, Theory of investment, and Economics 8 and 9, Elements of accounting, all of which are required for graduation. Students are strongly advised to take Geography 5 and 6, Regional economic geography, but to note that these courses count only as general electives, not toward absolving the natural science option.

RECOMMENDED PRE-COMMERCE SEQUENCES

The following arrangements of studies are recommended to meet the requirements for admission to the School of Commerce.

FRESHMAN YEAR	PH.B. DEGREE (without foreign language)	B.A. DEGREE (with foreign language)
English composition (1a-1b)	6 cr.	6 cr.
Mathematics, including course 7	8	8
History	6	6 or 0
Natural science—regular year course	10	0 or 10
—elementary surveys	....	0 or 10
Foreign language	....	8–6
Physical activity requirement	0	0
	30	28–30
SOPHOMORE YEAR		
General economics (1a-1b)	8	8
Elements of accounting (Econ. 8-9)	7	7
English literature (30 or 33)	....	4 or 6
Foreign language	....	6–8
Electives	....	7–0*
History	4	....
Science or mathematics (to complete 20 cr.)	2	....
English—intermediate composition (2a-2b)	4	....
Philosophy and (or) psychology	5–7	....
Physical activity requirement	0	0
	30-32	29-32

*Geography 5 and 6 (6 cr.) recommended.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

1. A total of not less than 128 credits and 128 grade-points, of which 68 credits and 68 points shall normally be earned in the School of Commerce during the last two years.

2. Completion of the general requirements in foreign language, science, history, mathematics, etc., for either a B.A. or a Ph.B. degree in the General Course of the College of Letters and Science. (Most of these general requirements should be fulfilled during the freshman and sophomore years.) See pages 64-68.

3. Completion of the following courses, preferably by the close of the junior year:

	Credits	
(a) Economics:		
Economics 1a-b—General economics (sophomore year)	8	
Economics 5—Money and banking	3	
Economics 6—Business letters and reports	2	
Economics 8-9—Elements of accounting (sophomore year)	7	
Economics 13—Marketing methods	3	
Economics 31—Business statistics	3	
Economics 142—Public utilities	3	
Economics—free electives	9	38
(b) Law 115—Commercial law		2
(c) Mathematics 7—Theory of investment (freshman year)		4
		44

4. Completion of a major (at present confined to economics) aggregating not less than 38 nor more than 58 credits; at least as many grade-points as credits must be earned in the major. A maximum of ten credits beyond the 38 specified above within the Department of Economics and a maximum of ten additional credits in other departments of the University may be prescribed by the professor in charge of the student's special field of interest. The intent of this rule is to restrict to 58 credits the total requirement which may be placed upon the student by the School of Commerce and the professor in charge.

Students whose grade-points in economics do not exceed their credits by at least fifty percent are required to diversify the work of the major and may not offer more than three courses from any one of the fields described below for upper-group students.

Students whose grade-points in economics exceed their credits by at least fifty percent are required to concentrate in a selected field. Their electives must consist of at least twelve credits, which may include a thesis, in one of the following fields:

Credits

I. Accounting

Econ. 181—Advanced accounting problems ---------- 2
Econ. 182—Cost accounting ---------- 2
Econ. 183—Accounts of consolidations and income taxes ---------- 2
Econ. 184—Auditing ---------- 2
Econ. 185—Analysis of financial reports- 1
Econ. 186—Accounting systems ---------- 2
Econ. 187—Governmental accounting---- 2
Thesis ---------- 4

II. Finance

Econ. 103—Public expenditures---------- 2
Econ. 110—Investments ---------- 2
Econ. 124—Taxation ---------- 3
Econ. 133—Financial history of the U. S. 3
Econ. 137—Business finance---------- 3
Econ. 151—Latin America; economic development and trade---------- 3
Econ. 153—International finance ---------- 2
Econ. 154—Risk and profit---------- 2
Econ. 185—Analysis of financial reports- 1
Econ. 191—Credit system ---------- 3
Thesis ---------- 4

III. Labor and Personnel

Econ. 119—Evolution of industry---------- 3
Econ. 122—Labor problems ---------- 3
Econ. 123—Labor legislation ---------- 3
Econ. 144—Capital and socialism---------- 3
Econ. 145—American labor history ------ 3
Econ. 171—Labor management ---------- 3
Econ. 172—Immigration and race problems ---------- 3
Econ. 174—Labor market ---------- 3
Thesis ---------- 4

IV. Marketing

Econ. 15—Principles of advertising---- 2
Econ. 114—Marketing management ----- 2
Econ. 116—Problems in national advertising ---------- 2
Econ. 126—International trade ---------- 3
Econ. 127—Cooperative marketing ------ 3
Econ. 128—Marketing agricultural products ---------- 3
Econ. 136—Transportation problems ---- 3
Econ. 151—Latin America ---------- 3
Econ. 170—Merchandising ---------- 2
Econ. 173—Economics of consumption-- 3
Thesis ---------- 4

Credits

V. Public Utilities

Econ. 135—Railway transportation------ 3
Econ. 136—Transportation problems ---- 3
Econ. 168—Highway transportation------ 3
Econ. 189—Railway rates and traffic----2-3
Econ. 195—Public utility management-- 3
Econ. 266—Seminary, public utilities (open to seniors by special consent)
Thesis ---------- 4

VI. Risk and Insurance

Econ. 121—Property insurance ---------- 2
Econ. 138—Life insurance ---------- 2
Econ. 154—Risk and profit---------- 3
Math. 24—Theory of life insurance------ 3
Thesis (4) or Econ. 110, Investments (2), or Econ. 133, Financial history of the United States (3), or Econ. 137, Business finance (3).

VII. Statistics

Econ. 131—Wages and prices ---------- 3
Econ. 132—Statistical analysis of business cycles ---------- 3
Econ. 196—Advanced statistical technique ---------- 3
Econ. 230—Seminary, statistical research (open to seniors by special consent)
Mathematics: Not to exceed 10 credits selected from the following courses (excepting that not both Math. 136 and calculus may be credited):
Math. 5a—Differential calculus ------ 3
Math. 5b—Integral calculus ---------- 3
Math. 118—Theory of probabilities---- 3
Math. 136—Mathematics preparatory to statistics ---------- 3
Math. 137—Mathematics of statistics-- 4

VIII. Commercial Teaching

The ordinary requirements of the major (depending upon the point-credit ratio in economics) and, in addition, the courses in the School of Education required of all candidates for the University Teachers' Certificate, including Educational Methods 75. At least eight credits must be selected from the preceding seven fields.

Undergraduates in this School may take courses aggregating 17 credits per semester, or 18 per semester in case none of their grades during the preceding semester was below B.

Students who have completed the foregoing requirements will be granted either the Bachelor of Arts degree or the Bachelor of Philosophy degree, depending upon which course requirements have been fulfilled.

ALPHA KAPPA PSI SCHOLARSHIP AWARD

The Wisconsin chapter of Alpha Kappa Psi, commerce professional fraternity, awards annually a bronze medallion to the junior man in the School of Commerce having the highest scholarship record for a period of three years at Wisconsin. Affiliation with the fraternity is not a consideration in making the award.

TRANSFERRED STUDENTS

Students with advanced standing from other institutions and transfers from other courses in the University must meet all the requirements of this School. Substantial equivalents will be accepted for required courses, but no requirements will be waived. Courses in business subjects such as accounting, business administration, advertising, business law, etc., pursued in other institutions in the freshman year will not be accepted as equivalents of the courses offered here in these subjects. Only in exceptional cases will courses in these subjects pursued elsewhere in the sophomore year be accepted in satisfaction of the requirements.

Programs which do not comply with the regulations herein described will be allowed only in the cases of students who are not candidates for a degree, who have had here or elsewhere a course equivalent to two years in the College of Letters and Science of this University, and who have had the prerequisites of the particular subjects they wish to pursue. Until such students have demonstrated their ability to maintain a grade of at least C in the courses to which they are admitted, their status will be that of students on probation.

THE GRADUATE YEAR

Requirements for Admission. To the graduate year of this School may be admitted students who hold the baccalaureate degree from this or other colleges and universities of good standing and whose personalities, character, and undergraduate records give promise of their ability successfully to meet the requirements outlined below and the demands of the business world for trained specialists and leaders. Applications for admission must be made in writing upon forms supplied by the Graduate School of the University.

Undergraduate Prerequisites. Graduate students who, in their undergraduate courses, have not substantially completed the major requirements described above must complete them either before entering upon the course of study outlined below or in connection with it. For such students more than two semesters of residence will be required for the completion of the course, how much more depending upon the number of credits earned during their undergraduate years toward the undergraduate major described above.

Course of Study and Other Requirements. The work of the graduate year will center in research seminars in the fields of accounting and statistics, marketing, public utilities, finance, and management, subject to the following regulations:

(1) Each student must select one of the foregoing as his field of specialization.

(2) His work for the year will be directed by the professor in charge of the field selected, who will arrange with him a program which shall include: (a) at least one of the research seminars conducted in the field selected; (b) other courses of graduate grade or seminars offered in the field, or assigned readings and papers to be done under his guidance outside of formal courses, or a combination of courses, readings, and papers which, together with his work in the seminar, will occupy not less than one-third nor more than one-half of his time; and (c) courses of graduate grade offered in the other fields mentioned above or in the Department of Economics outside of these fields, or a combination of the two sufficient, together with the credits granted for the work done under the heads (a) and (b), to aggregate not less than 20 credits for the year.

(3) The quality of the student's work for the year will be tested by a thesis or seminary topic on some subject connected with his field of specialization and by an examination at the close of the year covering the principles of economics, statistics and the field of specialization.

(4) Students who successfully pass the test mentioned under (3) will receive the degree of Master of Arts (Commerce) or Master of Philosophy, depending upon the scope of their undergraduate work.

SCHOOL OF JOURNALISM

WILLARD G. BLEYER, DIRECTOR, PROFESSOR OF JOURNALISM

PURPOSE AND PLAN. The studies included in the School of Journalism are of two kinds: (1) those designed to familiarize the student with present social, political, and economic conditions in the light of their origin and development, as well as with the literature of his own and other languages; (2) those intended to give the necessary instruction in the methods of journalism and advertising. The course of study has been arranged in the belief that three-fourths of the time should be devoted to a study of the subjects in the first group, such as history, political science, economics, sociology, philosophy, psychology, language, and literature, which are fundamental to journalistic work.

The journalistic work includes courses in reporting, copy reading, head-line writing, make-up, the writing of special articles, editorial writing, critical writing, women's departments in newspapers and magazines, the community newspaper, newspaper administration, the history and principles of journalism, the reporting of public affairs, and advertising. Courses are also offered in the methods of retail advertising, national advertising campaigns, business letter writing, and marketing methods. Representative French, Spanish, Italian, and German newspapers are studied in special courses for journalism students, given by the Departments of French, Spanish, and German. Courses in cartooning and in drawing for illustration are offered by the Department of Art Education.

Special lectures on various phases of journalistic work are given by newspaper men in active service. Additional information is available in a special bulletin of the School of Journalism, which may be had on application to the University Editor.

ADVERTISING. Students may obtain special training in preparation for advertising positions by combining courses in journalism with those in advertising. The normal arrangement of these courses is indicated in the Journalism-Advertising Group. Students who desire to enter the Journalism-Advertising Group must earn grade-point equal to credits in Economics 1a and 1b, and may not continue if they fail to earn a B in Economics 15.

TECHNICAL AND TRADE JOURNALISM. Although the curriculum in this school has been arranged primarily for students preparing for newspaper and magazine work, provision has also been made for those interested in technical and trade journalism. The courses in newspaper and magazine work may be elected by students in the professional schools and courses. Subject to the provisions governing the election of studies in other colleges (see page 60), students in the School of Journalism may elect courses in the College of Engineering, the Law School, the School of Education, and the College of Agriculture. By combining studies in commerce, agriculture, engineering, and other technical subjects with those outlined in the School of Journalism, students can obtain the necessary preparation for practically all lines of technical and trade journalism. One of the journalism courses, technical and trade writing (Journ. 107), is especially designed for students interested in this field.

LABORATORY EQUIPMENT. A newspaper office with typewriters, copy desk, files, and reference books is maintained as a laboratory for the students of journalism. The full leased wire service of one of the national press associations is received by printer telegraph. In the specially equipped typographical laboratory, students are given practical training in the principles of typography in connection

with the courses in editing, advertising, and newspaper business management. A reading room adjoining the journalism laboratory is provided with files of the leading newspapers of the country, as well as of important American and English journalistic periodicals.

PRACTICAL EXPERIENCE. Students preparing for journalism are given practical training on the two Madison daily newspapers, the editors of which cooperate with the instructors of journalism for this purpose. The editors of a number of Wisconsin weekly papers cooperate in giving students in the course in the Community Newspaper practical experience for a week during the spring recess. Places on the editorial and business staffs of student publications are awarded for the most part on a basis of literary and executive ability, and are open to all students. The *Daily Cardinal,* published as a morning newspaper in a printing plant of its own, is edited by a staff organized from the students interested in journalism, who thus get practice in all the details of newspaper making. The *Octopus,* a humorous periodical, and the *Badger,* the university annual, edited and published by the members of the senior class, give opportunity for a variety of experience in journalism. *The Wisconsin Engineer,* a monthly edited and published by the students of the College of Engineering, and the *Wisconsin Country Magazine,* a monthly edited and managed by the agricultural students, furnish practice for those interested in technical and trade journalism.

ADMISSION REQUIREMENTS. For admission to this School, students must be eligible for junior standing in the College of Letters and Science as a result of having completed satisfactorily the first two years of the B.A. General Course. A minimum of 58 credits is necessary for junior standing, but students are advised to present at least 60 credits for admission to the School of Journalism if they expect to complete in two years of residence the 124 credits required for graduation from the School of Journalism. Credits that are lacking may be earned by attendance at the summer session or by correspondence study, during the period between the junior and senior years.

Students entering the University as freshmen or sophomores must complete not only the studies required in the first two years of the B.A. General Course, but also such other studies as are prerequisite for advanced courses in the curriculum of the School of Journalism. The required courses for the freshman and sophomore years of the Pre-Journalism Sequence are as follows:

	Credits
Freshman English (English 1)	6
Two years of foreign language	14
Ancient, medieval, English, or modern history	6
Natural science: one year course or three elementary survey courses	10
General survey of English literature (English 30)	6
General economics (Economics 1a and 1b)	8
Introduction to government and politics (Pol. Sci. 1)	3
Introductory psychology (Psychology 1)	3
General survey of journalism (Journalism 1)	2
Newspaper reporting and correspondence (Journalism 2)	6

Students must obtain nine grade-points in English 1a and 1b in order to be admitted to Journalism 2. Only those students who obtain nine grade-points in Journalism 2 will be admitted to the School of Journalism, or will be permitted to elect any advanced courses in journalism.

Students who have completed two or more years in another institution (college, university, or normal school), must be eligible for junior standing in

the B.A. General Course of the College of Letters and Science, in order to be admitted to the School of Journalism. If they desire to complete the requirements for graduation from the School of Journalism in two years, they should present most of the subjects for admission to the School that students do who have attended the University for the first two years of their college work, excepting that credits in journalism are not necessary for admission. Students from other institutions should send a certified copy of their preparatory school and academic records to the chairman of the Committee on Advanced Standing, Bascom Hall, before coming to the University.

REQUIREMENTS FOR GRADUATION. For graduation from the School of Journalism, 124 credits are required, in which are included those earned in the first two years of college work and those obtained in the junior and senior years in the School of Journalism. Of this total 31 credits must be taken in required and elective courses in journalism, inclusive of Principles of advertising (Econ. 15), but not of the freshman Survey of journalism (Journ. 1). Problems in national advertising (Econ. 116) and Marketing methods (Econ. 13) may be included in the required 31 credits in journalism only by students in the Journalism-Advertising group.

The student's point-credit ratio (see page 51) in courses in journalism and advertising must be not less than 1.5, and in other courses not less than 1.0. Those students in the School of Journalism who fail to maintain the grade-point requirements will be advised to withdraw from the School.

Students in the class of 1933 are required to have 32 credits in one or more foreign languages for graduation from the School of Journalism, part of which may have been taken in preparatory schools; each year of foreign language work satisfactorily completed in a high school or academy is counted as four credits up to a maximum of 24 toward the required 32 credits. Beginning with the class of 1934, students must demonstrate by examination either (a) proficiency in one foreign language or, (b) a reading knowledge in two foreign languages. (See page 64.) For journalism students the languages which may be offered include Latin, Greek, French, Spanish, Portuguese, and German; other foreign languages may be offered only by special permission of the Director.

Upper-group seniors in the School of Journalism (those who have a point-credit ratio of not less than 1.5 for the first three years) have the privilege of writing a thesis (4 credits) presenting the results of a year's research in either contemporary or historical phases of newspapers, magazines, or advertising. These theses are bound and filed in the University Library. Lower-group seniors (those whose point-credit ratio is less than 1.5) will take four credits in elective courses in journalism, in place of the thesis.

The degree of Bachelor of Arts (Journalism) is granted to students who complete satisfactorily the requirements for graduation from the School of Journalism.

The other required courses for graduation from the School of Journalism and the number of credits to be earned in each are as follows:

I. REQUIRED COURSES IN JOURNALISM AND ADVERTISING

Course No.	Title of Course	Yr. and Sem.	OPTIONAL GROUPS				
			Daily Newspaper	Community Newspaper	Journalism-Advertising	Journalism-Magazine	Teachers
2	Newspaper reporting	2 or 3	6 cr.	6 cr.		6 cr.	6 cr.
3	Copy reading	3	6	6	3	6	6
4	Advertising typography	3-II			1		
6	Business letters and reports	3-II			2		
7	Community newspaper	3-I		2			
8	Newspaper business management	3-II		2			
13	Marketing methods	3-I			3		
15	Principles of advertising	3-I	2	2	2	2	2
22	News writing and reporting	2-II			3		
100	Thesis (or substitute)	4	4	4	4	4	4
104	Editorial writing	4-I	2	2	2	2	2
105	Writing of special articles	3-I	2	2	2	2	2
106	Critical writing	4-II	2			2	
107	Technical and trade writing	3-II				2	
109	Law of the press	4-II	1	1	1	1	1
110	History of journalism	4-I	3	3	3	3	3
111	Principles of journalism	4-II	3	3	3	3	3
112	Reporting of public affairs	3-II	2**				
116	National advertising	4-I			2		
123	Women's departments	3-II	2*		2*	2*	
	Teaching of journalism	SS					2
	Total Credits		33 cr.	33 cr.	33 cr.	33 cr.	31 cr.

*required of women students only. **required of men students only.

II. REQUIRED COURSES IN THE SOCIAL SCIENCES

In addition to the introductory courses in the Social Sciences required in the freshman and sophomore years at least fifteen credits must be chosen from not less than three of the five following groups:

1. History; 4 to 6 credits, preferably Recent history of the United States (Hist. 124).
2. Economics; 3 to 6 credits, preferably chosen from the following: Evolution of industry (Econ. 119), Capitalism and socialism (Econ. 144), Labor problems (Econ. 122), American labor history (Econ. 145).
3. Political Science; 3 to 6 credits, preferably chosen from the following: Political parties and party problems (Pol. Sc. 122), History of American political ideas (Pol. Sc. 165), Survey of world politics (Pol. Sc. 125), International organization and the League of Nations (Pol. Sc. 137), Municipal administation (Pol. Sc. 135).
4. Sociology; 3 to 6 credits, preferably chosen from the following: Introductory sociology (Sociol. 1, 2), Social psychology (Sociol. 139), Personality and social adjustment (Sociol. 197), Social anthropology (Sociol. 46).
5. Psychology and Philosophy; 3 to 6 credits, preferably chosen from the following: Applied psychology (Psych. 50), Abnormal psychology (Psych. 107), Psychology of thinking (Psych. 111), Logic (Phil. 11), Introduction to philosophy (Phil. 21), Man and nature (Phil. 25), Ethics (Phil. 41).

RECOMMENDED PRE-JOURNALISM SEQUENCE

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Journ. 1—General survey	1	Journ. 1—General survey	1
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Foreign language (one or two)	3-8	Foreign language (one or two)	3-8
History 1, 2, or 5	3	History 1, 2, or 5	3
Science	5	Science	5
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

SOPHOMORE YEAR

*Journ. 2—Newspaper reporting	3	*Journ. 2—Newspaper reporting	3
Engl. 30a—Survey of English literature	3	Engl. 30b—Survey of English literature	3
Foreign language	2-3	Foreign language	2-3
or		or	
Hist. 2—Modern European history	(3)	Hist. 2—Modern European history	(3)
Pol. Sci. 1—Introduction to government and politics	3	Psych. 1—Introductory psychology	3
Econ. 1a—General economics	4	Econ. 1b—General economics	4
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

*Students in the Journalism-Advertising group take a three-credit elective during the first semester and Journalism 22 during the second semester in place of Journalism 2.

COURSE IN JOURNALISM

LEADING TO THE DEGREE OF BACHELOR OF ARTS (JOURNALISM)

DAILY NEWSPAPER GROUP

JUNIOR YEAR

	Credits		Credits
Journ. 3—Copy reading	3	Journ. 3—Copy reading	3
Journ. 105—Writing of special articles	2	Journ. 112 or 123	2
Econ. 15—Principles of advertising	2	Social science options	6-8
Social science options	3-6	Free electives	5-3
Free electives	6-3		
	16		16

SENIOR YEAR

Journ. 104—Editorial writing	2	Journ. 111—Principles of journalism	3
Journ. 110—History of journalism	3	Journ. 109—Law of the press	1
Thesis or substitute	2	Journ. 106—Critical writing	2
Social science options	3-6	Thesis or substitute	2
Free electives	6-3	Social science options	2-6
		Free electives	6-2
	16		16

COMMUNITY NEWSPAPER GROUP

JUNIOR YEAR

Journ. 3—Copy reading	3	Journ. 3—Copy reading	3
Journ. 105—Writing of special articles	2	Journ. 8—Newspaper business management	2
Journ. 7—Community newspaper	2	Social science options	6-8
Econ. 15—Principles of advertising	2	Free electives	5-3
Social science option	3		
Econ. 25—Rural life	(3)		
Free electives	4		
	16		16

SENIOR YEAR

Journ. 104—Editorial writing	2	Journ. 111—Principles of journalism	3
Journ. 110—History of journalism	3	Journ. 109—Law of the press	1
Thesis or substitute	2	Social science options, or	6-8
Social science options	3-6	Econ. 127 or 193	(2)
Free electives	6-3	Free electives	4-2
	16		16

JOURNALISM—ADVERTISING GROUP

JUNIOR YEAR

Journ. 3—Copy reading	3	Journ. 4—Advertising typography	1
Journ. 105—Writing of special articles	2	Journ. 123—(required of women)	(2)
Econ. 13—Marketing methods	3	Econ. 6—Business letters and reports	2
Econ. 15—Principles of advertising	2	Social science options	3-8
Social science option	3	Free electives	8-5
Free electives	3		
	16		16

SENIOR YEAR

Journ. 104—Editorial writing	2	Journ. 111—Principles of journalism	3
Journ. 110—History of journalism	3	Journ. 109—Law of the press	1
Econ. 116—National advertising	2	Thesis or substitute	2
Thesis or substitute	2	Social science options	6-8
Social science options	3-6	Free electives	4-2
Free electives	4-1		
	16		16

JOURNALISM—MAGAZINE GROUP

JUNIOR YEAR

First Semester	Credits	Second Semester	Credits
Journ. 3—Copy reading	3	Journ. 3—Copy reading	3
Journ. 105—Writing of special articles	2	Journ. 107—Technical and trade writing	2
Econ. 15—Principles of advertising	2	Journ. 123—(required of women)	(2)
Social science options	3-6	Social science options	5-8
Free electives	6-3	Free electives	4-3
	16		16

SENIOR YEAR

Journ. 104—Editorial writing	2	Journ. 111—Principles of journalism	3
Journ. 110—History of journalism	3	Journ. 106—Critical writing	2
Thesis or substitute	2	Journ. 109—Law of the press	1
Social science options	3-6	Thesis or substitute	2
Free electives	6-3	Social science options	4-6
		Free electives	4-2
	16		16

GROUP FOR TEACHERS

Candidates for the University Teacher's Certificate are required to register in the School of Education as well as in the School of Journalism at the beginning of the junior year.

JUNIOR YEAR

Journ. 3—Copy reading	3	Journ. 3—Copy reading	3
Journ. 105—Writing of special articles	2	Elective in Education	3-2
Econ. 15—Principles of advertising	2	Social science options	6-9
Educ. 31—Principles of education	3	Free elective	4-2
Social science options	3		
Free elective	3		
	16		16

SENIOR YEAR

*Educ. Methods 88—Teaching of journalism	(2)	Journ. 111—Principles of journalism	3
Journ. 104—Editorial writing	2	Journ. 109—Law of the press	1
Journ. 110—History of journalism	3	Thesis or substitute	2
Thesis or substitute	2	Educ. Methods 76—Teaching of English	3
Social science options	4	Educ. 75—Psychology and practice of teaching	5
Free elective	5	Social science option	2
	16		16

*For the present the course in the methods of teaching journalistic writing and the supervision of student publications is given only in the Summer Session.

LIBRARY SCHOOL

CLARENCE BROWN LESTER, M.A., *Lecturer in Library Science, Director*
MARY EMOGENE HAZELTINE, B.S., *Associate Professor of Bibliography, Principal*
MARY KATHERINE REELY, B.A., *Assistant Professor of Bibliography*
AGNES KING, M.A., *Assistant Professor of Library Science*
MRS. WINIFRED LEMON DAVIS, M.A., *Assistant Professor of Library Science*
ALMA MATILDA RUNGE, B.A., *Assistant Professor of Library Science*
MRS. EMILY KLUETER BROWN, B.A., *Reviser and Assistant*
ELLEN BERNICE GIBSON, B.A., *Reviser and Assistant*

The Library School is a professional school offering a one-year course of residence training in library work to both men and women. This training may be taken either as an independent course by all who meet the entrance requirements, or as a joint course by seniors in the College of Letters and Science who qualify for entrance. In cooperation with the School of Education the Library School offers a special course for teachers; for detailed statement of this course, see School of Education.

The School is located on the second floor of the Madison Free Library building. These quarters, especially designed for the School, include complete equipment provided by the Free Library Commission, which administers the School jointly with the University, and provide every facility for professonal work. The School avails itself of all the library privileges of Madison.

For a complete catalog giving full description of the course of study, address the Principal, Miss Mary Emogene Hazeltine, Library School, 206 North Carroll Street, Madison, Wisconsin.

REQUIREMENTS FOR ADMISSION

1. Each candidate must fill out an application blank, a copy of which may be obtained by addressing the Principal, to whom it should be promptly returned.

2. Applicants must be at least twenty years of age. Persons over thirty-five who have no professional experience are advised against undertaking the course.

3. Graduates of accredited colleges whose undergraduate records are acceptable, are admitted upon the basis of such records, but must meet the other requirements for admission as set forth below. The applications of college graduates should, if possible, be filed not later than the first Friday in June of every year, and as much earlier as possible to allow time to arrange for the prerequisites, and to be sure of a place in the class, as the number of students that can be accepted is limited.

4. Students electing the joint course with the College of Letters and Science are admitted at the end of their junior year without written examination if they have upper-group status. The joint course is more fully discussed below.

5. All applicants not holding a degree from an approved college are required to take the entrance examinations, which are held on the first Friday in June of every year. Candidates for the examination must have completed sufficient work to classify them as juniors in an accredited college, while three years of college work or its equivalent are most desirable, and are urged upon all. Applicants taking the entrance examinations should understand that the examinations are designed to test their education, reading, and general information.

Sight translation from one foreign language is also included, the candidate having the choice of French or German.

6. A personal interview with prospective candidates is desirable whenever possible. Besides the background of education, so much depends upon the spirit in which library work is undertaken and the personal fitness for it, that much attention is given to the selection of students. Candidates are tested not only by college records or entrance examinations, but also by correspondence, by the testimony of their references, and by the personal interview.

The class entering in September of every year is made up not later than the first of July and includes the college graduates whose applications have already been accepted and the candidates who have passed the entrance examinations. Students are admitted only at the beginning of the first semester.

As the quarters of the School are limited, the number of students admitted for any one year can not exceed its desk room. If there are more candidates than can be accommodated, entrance is made competitive and college graduates with high scholastic standing and those who pass the examinations with the highest percentage are first accepted. The others are placed on a waiting list, from which is filled any vacancy created by the withdrawal during the summer of an accepted student.

PREREQUISITES FOR ALL APPLICANTS

Accepted candidates must meet several special entrance requirements *before the School opens in September.* All who have not had experience in library work must spend at least one month in actual work in a designated library before joining the class. The library and the conditions under which the work is to be performed must be satisfactory to the Principal and, if desired, arrangements for such work will be made by her.

Candidates must be skillful with the typewriter before entering, as the School requires its use in the preparation of many of the lessons, and no instruction is given in the School. Detailed information concerning this requirement is sent with the application blank. It is also required that the standard vertical or library handwriting be mastered. Accompanying the application blank is a required list of books to be read in preparation for the first appointment of the school year in book selection.

SUGGESTED PRELIMINARY PREPARATION

Undergraduates in college who are planning to enter the Library School on the completion of their college work are advised to select courses from the groups below. Economics, history, English, and science are especially suitable for majors. Besides French and German, two years of history, two of economics or political science, two of English, one of psychology, and one of pure science with its accompanying laboratory work are advised.

English literature, especially survey courses in English and American literature, and others in literary appreciation and criticism. Courses dealing with such literary types as the novel, the drama, and the short story, not only in English but in foreign languages, should be included; also work in composition or rhetoric.

Modern languages. French and German are most needed in library work. It is advisable to begin the language preparation in high school and to continue the study for at least two years in college.

Classical languages. Four years of high-school Latin are desirable.

History. Ancient, medieval, and modern European; history of England and of the United States.

Social Sciences. Economics, political science, and sociology.

Psychology, philosophy, and education.

Science—one or more of the following laboratory sciences: biology, botany, zoology, geography, geology, physics, chemistry.

Speech.

General business knowledge is of great value to the prospective librarian and is a prerequisite to success in administrative library positions. Candidates who have not had business experience are urged to become familiar with business methods, including the handling of a bank account, the management of a personal budget, a knowledge of the elementary principles of bookkeeping, and a general understanding of ordinary business transactions.

COURSE OF STUDY

The course of instruction extends throughout the university year, September to June. The work covers the following subjects, which are required of all:

First Semester	Credits
Book selection	2
Reference	2
Trade bibliography and bookbuying	1
Cataloging	5
Classification	3
Library administration	2
	15

Second Semester	Credits
Book selection	2
Reference	2
Public documents	1
Children's work and school libraries	1
Subject bibliography	3
Library administration and profession	3
Field practice	3
	15

The field practice is one of the distinctive features of the School. During February and March of every year the academic schedule is suspended and the students assigned for actual work in the libraries of the State, under the supervision of the librarians and the members of the faculty of the School.

This actual work seeks to cover not only the various phases of library technique and library administration, but also the larger service to the public through extension methods, library publicity, book selection, coöperation of libraries with schools, and story telling.

EXPENSES

(1) The tuition fee for residents of Wisconsin is $50 for the course, $25 being payable at the opening of each semester. For non-residents, the fee is $100 for the course, $50 to be paid at the opening of each semester. An infirmary fee of $4.50 per semester is required of each student. The tuition and fee are *payable at the Library School.* (2) Joint-course students pay the regular university tuition and fee plus the Library School tuition with such adjustments as will avoid double tuition. (3) The cost of textbooks and supplies for each student will average $40 for the year. (4) A graduation fee of $10 is charged.

Upon notification that they have been accepted as students of the School, applicants are required to pay a registration fee of $5, which will be applied on the tuition of the first semester. In case of the withdrawal of the applicant before the opening of the School, the registration fee will be retained to cover the expenses of correspondence, etc.

The Library Commission pays the railroad fare of students to and from the required field practice.

JOINT COURSE WITH THE COLLEGE OF LETTERS AND SCIENCE

A joint course has been arranged between the Library School and the College of Letters and Science for those who are not able to afford the time for four years of college work followed by a year of technical training. The joint course is made possible by a rule of the College of Letters and Science which provides that candidates for the Bachelor of Arts degree are allowed under specified circumstances to elect studies in other of the university colleges and schools to an amount not exceeding 20 credits.

A regular joint-course student, in order to receive a B.A. degree and the Library School diploma, must earn 130 credits, to be distributed usually as follows: 96 credits by the end of the junior year, including all the required work (excepting the thesis) in some one of the regularly authorized academic majors or fields of concentration in the College of Letters and Science; 30 credits for the studies of the Library School during the senior year; 4 credits for thesis during the senior year or, if a thesis be not undertaken, 4 credits in a summer session. Except for the thesis, joint-course students must devote the entire time of the senior year to the work of the Library School.

By properly arranging his studies and by carrying 16 credits per semester for the first three years, a student can ordinarily earn both the Bachelor of Arts degree and the Library School diploma at the end of four years. If the student does not carry 16 credits per semester for the full three years, the deficiency may be made up by work in the summer session.

If students elect the work of the Library School before they have attained senior rank, they are not exempt from the entrance examinations for the School. Furthermore, it should be understood that the work of the School is accepted for only ten college credits if completed before the beginning of the junior year, and that 20 college credits are allowed for it only if it is completed after the beginning of the junior year (the 20-credit rule quoted above requires junior standing before its privileges may be enjoyed).

Students in other institutions wishing to enter the joint course with advanced standing must bear in mind that the College of Letters and Science requires 40 credits in resident study; attendance at the Library School may not be counted toward fulfilling this requirement. Transfers from other colleges with intent to take the joint course are best accomplished at the beginning of the sophomore year. Arrangements for entering on advanced standing should be made through the Chairman of the Committee on Advanced Standing, University of Wisconsin, and the Principal of the Library School.

SCHOOL OF MUSIC

C. H. MILLS, DIRECTOR, PROFESSOR OF MUSIC

The School of Music offers a four-year course leading to the degree of Bachelor of Music; this course provides training in the fields of applied music, history and theory of music, and public school music.

Individual instruction in vocal or instrumental music may be taken by students not otherwise connected with the University, and such students are not required to pay the incidental fee, but they must be able to satisfy the usual entrance requirements as stated below.

Students enrolled in other schools and colleges of the University are allowed to take courses in the School of Music, subject to the approval of their adviser and the Director of the School of Music, under the following special regulations. Credits, not to exceed twenty, may be selected by sophomores, juniors, and seniors in theoretical music courses. A maximum of ten credits in applied music may be taken by juniors and seniors. The maximum number of credits in theoretical and applied music may not exceed twenty. Any student may take courses in applied music without credit provided he satisfies the entrance requirements. In the case of organ, piano, and violin, students will be expected to satisfy the entrance requirements for majors in these subjects, whether or not the subjects are taken for credit.

ENTRANCE REQUIREMENTS

The general requirements, other than those for admission to the University, include (1) sufficient natural musical ability, as determined by a series of tests, (2) the ability to sing at sight songs of the difficulty of the average hymn tune, and (3) knowledge of such fundamental facts of musical theory as key signatures, major and minor scales, note values, etc. A sub-freshman course, without credit, is offered for those unable to meet these requirements.

The special requirements for majors in applied music are:

ORGAN. No previous knowledge of organ playing is required, but a student will not be enrolled until he has acquired a satisfactory pianoforte technique and some skill in polyphonic playing.

PIANO. Applicants for admission, whether enrolled for credit or not, will be required to play music of the following grade or its equivalent; easier sonatas by Haydn and Mozart, Czerny, Op. 299, Books I and II, Heller, Op. 47, easier *Songs Without Words* by Mendelssohn. Knowledge of the formation, signatures, and fingering of major and minor scales is necessary; also the ability to read at sight hymn tunes and simple accompaniments.

VOICE. The student must be able to read simple music and must have had an amount of training equal to the first half of Concone, with the usual technical study for the same period.

VIOLIN. Candidates must be well grounded in correct position, intonation, tone, and bowing, and must have mastered the equivalent of David's Violin School, Part 1, and the easier pieces of Dancla, Alard, and others.

GRADUATE WORK

The degree of Master of Arts is awarded on the basis of a suitable thesis and courses. Candidates for this degree are required to take a minimum of 9 credits in music and 9 credits in education in addition to the thesis. Candidates must satisfy all requirements for the Bachelor of Arts degree, including 32 credits in foreign language and 75 out of 120 credits in academic subjects. For definite information regarding the nature of the required work, inquiry should be made of the Director of the School of Music.

FEES AND TUITION

Regularly enrolled students in the School of Music (i.e., those working toward a degree) and special students taking theory courses are required to pay the regular university fees (see page 15). Persons taking courses in applied music, either regularly enrolled students or special students in applied music only, are required to pay the tuition fees charged for such instruction, as noted below. Special students taking only private instruction in applied music are not required to pay the general fee or the non-resident tuition fee.

Students enrolling at any time previous to the fifteenth day of any semester will be charged the full applied music and practice room fees for the semester. Students enrolling thereafter may receive some reduction at the discretion of the Director. All fees must be paid at the beginning of each semester; until this has been done, the student will not be entitled to receive instruction.

Applied music fees are refunded in full if no lesson has been taken and if the name of the student does not appear on the schedule of the instructor. If any lesson has been taken, only one-half the fee is refunded. No refund is made after mid-semester except in cases of protracted illness when the instructor makes such recommendation to the Director. Practice-room fees are refunded on the basis of time expired until mid-semester, after which no refund is made. The concert fee is not refunded unless a student leaves school within the first two weeks of the semester. Students who complete satisfactorily a semester of work in the University Orchestra are entitled to a refund of one-half their applied music fee upon the recommendation of the Director.

Tuition in applied music, per semester:

One-half hour of instruction once a week	$25
One-half hour of instruction twice a week	45
Class piano or voice for public school music	45
One hour of instruction once a week	45
One hour of instruction twice a week	90
Piano technic	4

Rent of practice rooms, per semester:

Organ, one hour daily	$9*
Piano, one hour daily	4
Rent of band and orchestra instruments	2.50
Concert fee, per academic year	1

*This rate does not apply to the use of the concert organ, for which special arrangements must be made.

ORGANIZATIONS

THE UNIVERSITY ORCHESTRA, composed of about sixty-five players, is organized to study the larger classical forms and to present them in public. Rehearsals are held twice a week in Music Hall during the school year. Membership is open to the entire student body, and to others who can qualify in the tryouts. After two semesters' enrollment in the orchestra, a university student may receive one credit per semester. This work is listed as Music 76. Mr. Morphy, Director.

THE UNIVERSITY BANDS consist normally of about two hundred men, divided among three organizations known as the Concert Band, the Second Band, and the ROTC Band; the first is mainly a concert organization while the second forms a training school for the less experienced students. The ROTC Band is a unit of the Military Department. These organizations rehearse three times each week. Upper classmen who are members of the concert band and who remain for duty at Commencement are compensated for their services to the extent of thirty dollars. Students who desire to join should confer with the Director of the Bands. Mr. Morphy, Director.

Opportunity is offered to the best players in the bands and orchestra to participate in small groups playing chamber music. If this work is to be taken for credit, the material to be covered may be found listed under Music 85. For information concerning this work students should consult Mr. Morphy, Director.

THE LIGHT OPERA ORCHESTRA is limited to twenty-four men students. Overtures, selections, and light opera music will be studied and performed. This orchestra will accompany the annual Haresfoot production. Membership decided by tryouts. Mr. Dalley, Director.

THE SECOND ORCHESTRA is open to all university students who through lack of experience or conflict do not play in the regular University Orchestra. The fundamentals of orchestral playing are stressed in the study of the easier types of music. Practical experience in conducting and interpretation is offered. Instruments may be rented from the School of Music. Mr. Dalley, Director.

THE MEN'S GLEE CLUB is a campus organization incorporated under the laws of the state of Wisconsin. Two separate divisions are maintained: the Concert Club, the membership of which is selected by competitive tryouts, and the Corporation, to which members of the Concert Club may be elected after one year's service. Vacancies in the club are filled by competitive trial, and membership is open to the entire student body, including graduate students. Mr. Swinney, Director.

THE WOMEN'S GLEE CLUB is an organization of forty-five women which makes frequent public appearances locally. Vacancies are filled by competitive trial and membership is open to the entire student body, including graduate students. Mr. Dalley, Director.

THE UNIVERSITY SINGERS, an organization of fifty voices, studies and performs masterpieces of choral literature. Membership is on a competitive basis and open to any student in the University, including graduate students. Mr. Swinney, Director.

THE A CAPPELLA CHOIR is limited in number to thirty-two. It presents in concert the best part songs in musical literature. Membership is on a competitive basis and is open to any student in the University, including graduate students. Mr. Swinney, Director.

EQUIPMENT

The School of Music is provided with a concert auditorium, lecture halls, teaching studios for applied music, practice rooms, a four-manual organ, a two-manual organ, five two-manual reed organs, pianos, orchestral and band instruments, and an equipment of mechanical instruments. Four audition rooms have recently been equipped so that students are enabled to acquaint themselves with an extensive library of phonograph records. The School occupies two adjacent buildings on the main campus, Music Hall and Music Annex.

CONCERTS AND RECITALS

Lecture-recitals and concerts, open to the public without charge, are given by members of the Faculty of the School of Music at stated intervals during the concert season.

Student recitals, free to all students of the University and open to all others by invitation, are held at frequent intervals throughout the school year.

Public performances being part of the course of study in a practical subject, all students are required to participate in a program when they are, in the instructor's opinion, sufficiently prepared.

The artist recital series consists of an annual course of recitals of chamber music. Students enrolled in the School of Music are required to attend the concerts for which a fee of one dollar a year is charged, payable at the time of registration. The Lener String Quartet and the London String Quartet have appeared under the auspices of the School.

REQUIREMENTS FOR TEACHERS

Candidates for the degree of Bachelor of Music who wish to obtain the University Teachers' Certificate are required to register in the School of Education at the beginning of their junior year and to earn a total of 124 credits and 124 points, with a minimum of 55 credits in Letters and Science. The following courses are specifically required:

	Credits
Educ. 31—Principles of education	3
Educ. 75—Psychology and practice of teaching	5
Departmental teachers' courses	4
Elective in the Department of Education	3
	15

GENERAL

All students must present their registration cards from the Registrar's office before beginning assigned work in the School of Music. All students in applied music will be examined by the Examining Committee of the School of Music to learn the status of their work and, in the case of juniors and seniors, to determine whether or not the subject can be taken for credit.

The regular university calendar applies to the School of Music, but students in applied music may enter at any time. All university holidays are observed without make-up of lessons in applied music.

A student is expected not to take part in any public performance without the consent of his instructor and the director.

COURSE IN MUSIC

LEADING TO THE DEGREE OF BACHELOR OF MUSIC

A total of 120 credits and 120 grade-points is required for the degree, including a minimum of 54 credits in the College of Letters and Science and 46 to 66 credits in the School of Music, this number to be decided by consultation with the Director. A total of 32 credits in foreign language, including that taken in high school, is required for graduation. Students will not be enrolled as juniors unless they have earned a point-credit ratio of 1.5 in music subjects during the sophomore year. The candidate may choose his major in one of the following fields, in which he may obtain a maximum of 20 credits: applied music, history and theory of music, public school music. The following course of study is a suggested outline which is subject to alteration, with the consent of the adviser, to meet individual cases.

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Music 81, 82, 83, or 84*—Applied music	2	Music 81, 82, 83, or 84*—Applied music	2
Music 1—Harmony	3	Music 1—Harmony	3
Music 75—Solfeggio	1	Music 75—Solfeggio	1
Foreign language	4	Foreign language	4
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
History 1, 2, or 5	3	History 1, 2, or 5	3
Physical activity requirement	0	Physical activity requirement	0
	16		16

SOPHOMORE YEAR

Music 81, 82, 83, or 84*—Applied music	2	Music 81, 82, 83, or 84*—Applied music	2
Music 11—Second-year harmony	3	Music 11—Second-year harmony	3
Music 21—Counterpoint	2	Music 21—Counterpoint	2
Educ. 31—Principles of education	3	Music 65†—Appreciation of music	1
Foreign language	3-4	Music 89—Instrumental class instruction	2
English or history	3-2	Foreign language	3-4
Physical activity requirement	0	English or history	3-2
		Physical activity requirement	0
	15-16		15-16

*Majors in Public School Music substitute Music 87 or 88.

†Music 65 may also be taken in the first semester if the total number of credits does not exceed 16.

JUNIOR AND SENIOR YEARS

Music 5—Form and analysis	2
Music 31—History of music	4
Music 90—Instrumental methods	2
Music 95—Elementary survey	4
Music 102—Elementary composition	2
Music 112—Advanced counterpoint	2

The remaining credits necessary to meet the requirements for graduation will be arranged by the student in consultation with the adviser. If a teacher's certificate is desired, a total of 124 credits must be earned, including the special courses mentioned on the preceding page.

DEPARTMENTS OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
I, II—semester course given each semester
cr—number of credit hours per semester
*—to be arranged

Courses numbered under 100 may be credited only by undergraduates; those in the 100-group may be credited by both undergraduates and graduates; those in the 200-group are ordinarily open only to graduates.

ANTHROPOLOGY

(See Sociology and Anthropology.)

ART EDUCATION

WILLIAM HARRISON VARNUM, B.P., *Professor of Art Education, Chairman*
ROLAND STEWART STEBBINS, *Assistant Professor of Art Education*
FRANK ZOZZORA, B.A., *Instructor in Art Education*

These courses are offered by the Department of Art Education in the School of Education and are open to all qualified students. Other courses offered by the department may be elected by upperclassmen under the provisions of Section 18, page 60. See Drawing, page 119, for courses in mechanical drawing and lettering.

50. FREEHAND DRAWING AND PERSPECTIVE. I; 3 cr. Introduction to pictorial expression. Open to freshmen. Lab. fee $1.25. 3 sections—8-10 MWF, 1:30-3:30 MWF, 8-10 TTS. Mr. Zazzora.

51. FREEHAND DRAWING; LIGHT AND SHADE. II; 3 cr. Prerequisite: Art Education 50. Lab. fee $3.00. 3 sections—8-10 MWF, 1:30-3:30 MWF, 8-10 TTS. Mr. Zozzora.

55. ADVANCED DRAWING AND ANATOMY. Yr; 2 cr. Prerequisite: Art Education 51 or consent of instructor. Lab. fee $4.00 per semester. 1:30-3:30 TT. Mr. Stebbins.

140. STAGE DESIGN (Speech 140). II; 2 cr. Prerequisite: Speech 19 or graduate standing in speech. 3:30 TT. Mr. Varnum.

ART HISTORY AND CRITICISM

OSKAR FRANK LEONARD HAGEN, Ph.D., *Professor of History and Criticism of Art, Chairman*
FREDERIC L. JOCHEM, M.A., *Instructor in History and Criticism of Art.*
LAURENCE SCHMECKEBIER, Ph.D., *Instructor in History and Criticism of Art*

The department offers to the general student semester courses providing broad surveys of the history of art based upon aesthetic analysis, i.e., appreciation and interpretation. Students unfamiliar with the history of art should normally not proceed to elect an advanced course before they have attended an elementary course. Semester courses 50 and 54 are designed to familiarize the student with the principal art trends (architecture, sculpture, and painting) from the prehistoric cave paintings to the art of the present day. The courses offered in the hundred group treat in a more specific way subjects introduced and broadly sketched in the survey group. These courses not only serve majors, but are of general cultural interest and may supplement the work done in the departments of history and literature. A selection from the courses listed below, that is of elementary, advanced, and exclusively graduate courses, is offered each year in adequate sequence.

MAJOR. 26 credits, including thesis for upper-group students; in addition, a reading knowledge of French, German, or Italian; 12 credits in history as a minimum, (courses particularly recommended are History 1, Medieval history, and History 134, The Renaissance).

It is also recommended, especially for those who expect to teach art or history of art, that from 6 to 12 credits be taken in practice courses (design, painting, etc.), which for the present may be secured in the Department of Art Education. The requirements for a teachers' certificate may be found under the School of Education.

HISPANIC STUDIES. Students interested in this field of concentration should consult page 58.

Courses not definitely scheduled for 1932-33 may be offered either during the second semester of that year, or at some time in 1933-34.

22. ELEMENTS OF FINE ARTS WITH REFERENCE TO AESTHETIC THEORY. I; 3 cr. A study of critical judgments in art. Prerequisite: Sophomore standing. 9 MWF. Mr. Schmeckebier.

35. HISTORY OF ARCHITECTURE. Yr; 3 cr. Prerequisite: Sophomore standing. Not offered 1932-33.

44. MEDIEVAL ART. Yr; 3 cr. A survey of medieval sculpture and painting (mosaics, stained glass, illuminated manuscripts) of Europe from the early Christian through the Gothic epochs. Prerequisite: Sophomore standing. Not offered 1932-33.

50. ORIENTAL, GREEK, AND MEDIEVAL ART. 2-3 cr. The great originative styles of Egypt, Hellas, and the Christian West through the Gothic period in architecture, sculpture, and painting. Prerequisite: Sophomore standing. (Course 54 offers a continuation of the historical development to the present day). Mr. Hagen.

54. Renaissance to Modern Art; How the Artist Sees and Presents Reality. I; 2-3 cr. A survey of such problems of vision as constitute the history of painting, sculpture, and architecture from the fifteenth century to the present age. Prerequisite: Sophomore standing. Lab. fee $3.75. 10 MWF. Mr. Hagen.

101. History of the Graphic Arts. 3 cr. History of woodcuts, engravings, and etchings from the origins in 1400 A.D. to the present day. Prerequisite: Sophomore standing.

104. Italian Sculpture. 2 cr. Prerequisite: Art History 54.

111. Studies in Iconography. I; 3 cr. Prerequisite: Consent of instructor. 9 TT and third hour. Mr. Schmeckebier.

113. History of Greek Sculpture. 3 cr. Prerequisite: Sophomore standing. Mr. Hagen.

114. Romanesque and Gothic Sculpture. I; 3 cr. Prerequisite: Sophomore standing. 11 TT and third hour. Mr. Schmeckebier.

126. Flemish Painting from Van Eyck to Rubens. 3 cr. Prerequisite: Sophomore standing.

128. French Painting. 3 cr. Prerequisite: Sophomore standing.

133. Renaissance Architecture. I; 3 cr. Prerequisite: Sophomore standing. 2:30 MWF. Mr. Jochem.

151. Italian Painting of the Renaissance. 3 cr. The period from Giotto to Michelangelo and Rafael. Prerequisite: Art History 54. Mr. Hagen.

152. Northern Painting of the Renaissance. 3 cr. Painting in France, Flanders, Holland, and Germany from the Van Eycks to Albrecht Duerer. Prerequisite: Art History 54. Mr. Hagen.

153. Painting in the Age of Rembrandt. 3 cr. Prerequisite: Art History 54. Mr. Hagen.

155. Venetian Painting of the Renaissance. 3 cr. Prerequisite: Art History 54. Mr. Schmeckebier.

157. Spanish Art. I; 3 cr. Prerequisite: Sophomore standing. 11 MWF. Mr. Hagen.

210. Seminary. Yr; 2 cr. The subjects of research, which change from semester to semester, are generally chosen from the fields covered in the advanced courses. Prerequisite: Consent of instructor. Mr. Hagen.

ASTRONOMY

JOEL STEBBINS, Ph.D., Sc.D., *Professor of Astronomy, Chairman*
CHARLES MORSE HUFFER, Ph.D., *Assistant Professor of Astronomy*

1. ELEMENTARY ASTRONOMY. I; 3 cr. Prerequisite: Sophomore standing. Mathematics not required. Lecture 1:30 MWF; one evening per week at observatory. Mr. Stebbins.

6. NAVIGATION AND PRACTICAL ASTRONOMY. II; 2 cr. Prerequisite: A course in trigonometry. 3:30 Tu, 10-12 S. Mr. Stebbins.

7. ADVANCED FIELD ASTRONOMY. Yr; 2-3 cr. Prerequisite: Astronomy 6. Mr. Stebbins.

17. SURVEY OF ASTRONOMY. II; 3 cr. A brief course designed to fulfill in part the non-professional science option for the B. A. degree. May be credited by students in the Ph.B. course only as a free elective. Prerequisite: Mathematics 2. Not open to students who have taken Astronomy 1 or its equivalent. Lecture 1:30 MWF; work at observatory to be arranged. Mr. Huffer.

101. ASTROPHYSICS: THE SOLAR SYSTEM. I; 3 cr. Prerequisite: Mathematics 2, Physics 31. Mr. Huffer.

102. ASTROPHYSICS: STELLAR ASTRONOMY. II; 3 cr. Prerequisite: Mathematics 2, Physics 31. Mr. Huffer.

116. CELESTIAL MECHANICS. Yr; 3 cr. Prerequisite: A course in calculus. Mr. Stebbins.

200. RESEARCH. Yr; 3-5 cr. Graduate students and others qualified to pursue advanced astronomical studies will be received in the Washburn Observatory as assistants. Facilities for independent original work will be afforded to such students, and their work, if of sufficient value, may be printed in the Publications of the Washburn Observatory.

BACTERIOLOGY

(See Medical Bacteriology or Agricultural Bacteriology.)

BIOLOGY

Study in the biological sciences is conducted in the independent though coordinated departments of Botany, Zoology, Anatomy, Physiology, Physiological Chemistry, Genetics, Pathology and Medical Bacteriology, Pharmacology and Toxicology, Plant Pathology, and Agricultural Bacteriology.

1. GENERAL BIOLOGY. Yr; 5 cr. An elementary one-year course in general biology may be taken by combining Botany 1 and Zoology 1, both of which are given each semester. Either one may precede the other, although the normal order is to follow botany with zoology. Introductory to botany, zoology, anatomy, bacteriology, and physiology. (See Botany 1 and Zoology 1.)

THE TEACHING OF BIOLOGY. See School of Education.

BOTANY

EDWARD MARTINIUS GILBERT, Ph.D., *Professor of Botany and Plant Pathology, Chairman*
CHARLES ELMER ALLEN, Ph.D., *Professor of Botany*
GEORGE SMITH BRYAN, Ph.D., *Professor of Botany*
BENJAMIN MINGE DUGGAR, Ph.D., *Professor of Physiological and Applied Botany*
LEWIS RALPH JONES, Ph.D., Sc.D., *Professor of Plant Pathology*
GEORGE WANNAMAKER KEITT, Ph.D., *Professor of Plant Pathology*
JAMES BERTRAM OVERTON, Ph.D., Sc.D., *Professor of Plant Physiology*
ROLLIN HENRY DENNISTON, Ph.D., *Assistant Professor of Botany*
NORMAN CARTER FASSETT, Ph.D., *Assistant Professor of Botany*
EMMA LUELLA FISK, Ph.D., *Assistant Professor of Botany*
JOHN JEFFERSON DAVIS, B.S., M.D., *Curator of the Herbarium*
GEORGE OLDS COOPER, Ph.D., *Instructor in Botany*
RICHARD IRVING EVANS, Ph.D., *Instructor in Botany*
EARL ADRIAN HELGESON, Ph.D., *Instructor in Botany*

MAJOR. 30 credits, including thesis, Botany 1, and an elementary course in zoology. A thesis is required of all seniors majoring in botany unless exception is made by the chairman of the department.

1. GENERAL BOTANY. I, II; 5 cr. Preliminary to all advanced work. Accepted with Zoology 1 to make up an elementary course in general biology. Lab. fee $5.00. Lecture 2:30 MW or 10 TT; 4 hrs. lab., 2 hrs. quiz. Mr. Bryan, Miss Fisk, and staff.

2. ADVANCED GENERAL BOTANY. II; 5 cr. Accepted as part of a teacher's minor or, with Botany 1, in satisfaction of the requirement of a year of natural science. The laboratory work of the course is a comprehensive survey of the plant kingdom and includes in the late spring the use of keys in the identification of many plants. The lectures deal primarily with the history of the development of the scientific spirit in biology and involve a discussion of the modern problems of evolution, inheritance, variation, etc. Prerequisite: Botany 1. Lab. fee $5.00. Lecture 10 TT; 4 hrs. lab., 2 hrs. quiz. Mr. Bryan, Miss Fisk, and staff.

17. SURVEY OF BOTANY: NATURE OF THE PLANT WORLD. II; 3 cr. A brief course designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Open to all students, excepting those who have taken Botany 1 or its equivalent. Lab. fee $3.00. Lectures, discussion, and laboratory; 1:30-3:30 MW, 1:30 F. Mr. Gilbert.

100. SENIOR THESIS. Yr; 2-3 cr. A subject should be selected, whenever possible, before the close of the junior year. Lab. fee $1.50 per cr. 10 TT. Staff.

101. DISEASES OF PLANTS. I; 3 cr. Prerequisites: Botany 1 and Agr. Bact. 1. Lab. fee $4.50. 1:30-3:30 MWF. Mr. Gilbert, Mr. Walker.

102. METHODS IN PLANT PATHOLOGY. I; 3 cr. Prerequisite: Botany 101. Lab. fee $4.50. 10-12 MWF. Mr. Riker.

103. MORPHOLOGY OF ALGAE. I; 3 cr. Prerequisite: Botany 1. Offered 1932-33 and in alternate years. Lab. fee $3.50. 8-10 TTS. Mr. Allen.

104. Morphology of Fungi. I; 3 cr. Prerequisite: Botany 1. Lab. fee $3.50. 8-10 MW, 8 F. Mr. Gilbert.

107. Morphology of Gymnosperms. I; 3 cr. Prerequisite: Botany 1. Offered 1931-32 and in alternate years. Lab. fee $3.50. 1:30-3:30 MWF. Mr. Bryan.

108. Morphology of Angiosperms. II; 3 cr. Prerequisite: Botany 1. Lab. fee $3.50. 8-10 MWF. Miss Fisk.

110. Plant Histology. I; 3 or 4 cr. Prerequisite: Botany 1. Lab. fee $3.50. 10-12 MWF. Mr. Denniston.

111. Microscopical Examination of Drugs and Foods. II; 3 cr. Prerequisite: Botany 110. Lab. fee $4.50. 10-12 MWF. Mr. Denniston.

112. Morphology of Bryophytes. II; 3 cr. Prerequisite: Botany 1. Offered 1932-33 and in alternate years. Lab. fee $3.50. 8-10 TTS. Mr. Allen.

113. Morphology of Pteridophytes. II; 3 cr. Prerequisite: Botany 1. Offered 1931-32 and in alternate years. Lab. fee $3.50. 1:30-3:30 MWF. Mr. Bryan.

117. Structure of Economic Plants. I; 3 cr. Prerequisites: Botany 1 and 2. Lab. fee $3.50. 8-10 MWF. Miss Fisk.

118. Structure of Fruits and Seeds. II; 3 cr. Prerequisites: Botany 1 and 2. Not offered 1932-33. Lab. fee $3.50. Miss Fisk.

129. Classification of Cultivated Plants. I; 2 or 3 cr. Prerequisite: Botany 1. Lab. fee $3.00. 8-10 TT. Miss Fisk.

130. Identification and Classification of Seed Plants. II; 3 or 4 cr. Prerequisite: Botany 1. Lab. fee $3.00. 8-10 TTS. Mr. Denniston.

131. Dendrology. II; 2 cr. Prerequisite: Botany 1. 3:30-5:30 TT. Mr. Denniston.

146. Plant Physiology. II; 4 cr. Prerequisites: Botany 1 and a knowledge of physics and chemistry. Lab. fee. $1.50 per lab. cr. Lecture 11 TT; lab. 9-11 ThS or 1:30-3:30 TT; quiz 11 S or 3:30 Th. Mr. Overton, Mr. Helgeson.

154. Evolution of Plants. I; 2 cr. Prerequisites: Botany 1 and 2. Offered 1931-32 and in alternate years. Lecture 2:30 MW. Mr. Allen.

156. Inheritance and Variation. II; 2 cr. Prerequisites: Botany 1 and 2. (Not offered 1932-33.) Mr. Allen.

160. Plant Geography of Wisconsin. II; 3 or 4 cr. Prerequisite: Botany 1. Lab. fee $3.50. 1:30-4:30 MF. Mr. Fassett.

200. Research. Yr; *cr. Investigation may be undertaken in any department of botany in which the student's preparation is adequate. Lab. fee $2.00 per credit. Staff.

214. Seminary in General Botany. Yr; * cr. 4:30-6 W. Mr. Allen.

215. Seminary in Plant Physiology. Yr; * cr. 4:30-6 W. Mr. Duggar, Mr. Overton.

220. Advanced Mycology. Yr; 2 cr. Morphology and classification of fungi Prerequisites: Botany 101, 104. Lab. fee $2.00. 1:30-3:30 TT. Mr. Gilbert.

221. Classification of Parasitic Fungi. Yr; *cr. Practice in the identification of parasitic fungi in field and laboratory, with discussions of principles used in classification and nomenclature. 3:30-5:30 F. Mr. Davis.

247. Advanced Plant Physiology. Yr; * cr. Prerequisite: Botany 146. Lab. fee $1.50 per lab. credit. 11 MW and lab. Mr. Overton.

248. Physiological Methods and Materials. I; 3 cr. Prerequisite: Botany 146. Lab. fee $2.50. 8-10 TuS, 9-11 Th. Mr. Duggar, Mr. Helgeson.

249. Special Physiology of Pathogenic Fungi. II; 2 cr. Prerequisite: Botany 146. 9 TT. Mr. Duggar.

250. Cytology. Yr; 5 cr. Prerequisites: Botany 1 and 2. Lab. fee $5.00. Lecture 10 TT; lab. 10-12 MWF. Mr. Allen.

252. Cytology of the Fungi. II; 1-2 cr. The various methods of fixation and staining of fungi, with laboratory exercises applying these methods in a study of bacteria and fungi. Prerequisite: At least one semester of general cytology. Lab. fee $2.00 per cr. Mr. Gilbert.

See Zoology 106 and 107 and Genetics 101-106 for other courses in evolution and heredity; also Horticulture 7 and 8 for courses in plant propagation and floriculture. The announcements of the Departments of Genetics and Horticulture appear under the College of Agriculture.

CHEMISTRY

Joseph Howard Mathews, Ph.D., *Professor of Chemistry, Chairman*
Homer Burton Adkins. Ph.D., *Professor of Chemistry*
Farrington Daniels, Ph.D., *Professor of Chemistry*
Richard Fischer, Ph.D., *Professor of Chemistry*
Louis Kahlenberg, Ph.D., *Professor of Chemistry*
Francis Craig Krauskopf, Ph.D., *Professor of Chemistry*
James Henri Walton, Ph.D., *Professor of Chemistry*
Norris Folger Hall, Ph.D., *Associate Professor of Chemistry*
Samuel Marion McElvain, Ph.D., *Associate Professor of Chemistry*
Henry August Schuette, Ph.D., *Associate Professor of Chemistry*
Howard Newton Calderwood, Ph.D., *Assistant Professor of Chemistry*
Villiers Wilson Meloche, Ph.D., *Assistant Professor of Chemistry*
Clarence Harvey Sorum, Ph.D., *Assistant Professor of Chemistry*
John Warren Williams, Ph.D., *Assistant Professor of Chemistry*
James Frederic Hazel, Ph.D., *Instructor in Chemistry*
Matthew Leslie Holt, Ph.D., *Instructor in Chemistry*
Michael William Klein, Ph.D., *Instructor in Chemistry*
William Earl Roseveare, Ph.D., *Instructor in Chemistry*

REQUIREMENTS FOR THE MAJOR

Course No.	Title of Course	OPTIONAL FIELDS OF CONCENTRATION				
		Organic	Physical	Food	Inorganic	Premedical
1	General chemistry and qualitative analysis	8-10 cr.	8-10 cr.	8-10 cr.	8-10 cr.	8-10 cr.
10	Mathematical chemistry*	3	3	3	3	3
11	Quantitative analysis	8	8	8	10	6
120	Organic—lectures	4	4	4	4	4
121	Organic—laboratory	6	4	4	3	4
130	Physical—lectures	4	4	4	4	4
131	Physical—laboratory	3	6	3	4	2
100	Thesis	6	6	6	6	6
123	Characterization of organic compounds	3	--	--	--	--
146-7	Food chemistry	--	--	5	--	--
104,117	Physiological chemistry	--	--	--	--	8
--	Adv. technical elective	--	--	--	2	--
	Total Credits	45–47	43–45	45–47	44–46	45–47

*May be omitted if student takes Mathematics 5a or 54.

Chemistry 1a and Chemistry 1b are consecutive courses in general chemistry and are desirable courses for students majoring in other sciences or for those desiring a general cultural knowledge of chemistry. These two courses satisfy the requirements of 10 credits in science for the B.A. degree. The work in Chemistry 1a is devoted to theoretical chemistry and descriptive chemistry of the non-metals, and that of Chemistry 1b to the general chemistry of the metals and qualitative analysis. Students who have had good courses in chemistry in high school are placed in sections in which the work is more advanced. The equivalent of either of these courses may be taken in the summer session and Chemistry 1a is also offered in the second semester.

1a. GENERAL CHEMISTRY. I; 5 cr. Lab. fee and deposit, $17.50. Lecture 9 WF, 10 TT, or 11 TT; 6 hrs. lab., 2 hrs quiz. (Repeated second semester; lecture 2:30 TT.) Mr. Walton, Mr. Krauskopf, Mr. Sorum, Mr. Hazel, and staff.

1b. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. II; 5 cr. Continuation of Chemistry 1a, which is prerequisite. Lab. fee and deposit, $17.50. Mr. Walton, et al.

2a. GENERAL CHEMISTRY. I; 4 cr. For freshmen in engineering only. Lab. fee and deposit, $15.00. Lecture 11 MW; 4 hrs. lab., 2 hrs. quiz. (Repeated second semester; lecture, 2:30 TT.) Mr. Kahlenberg, Mr. Calderwood, Mr. Holt, and staff.

2b. GENERAL CHEMISTRY AND QUALITATIVE ANALYSIS. II; 4 cr. Continuation of Chemistry 2a, which is prerequisite. Lab. fee and deposit, $15.00. Mr. Kahlenberg, Mr. Calderwood, Mr. Holt, and staff.

10. MATHEMATICAL CHEMISTRY. I; 3 cr. Prerequisites: Algebra, trigonometry, and Chemistry 1 or 2. Students who desire to specialize in chemistry should take Chemistry 10 or Mathematics 5. 9 MWF. Mr. Daniels.

11. Quantitative Analysis. Yr; 3-5 cr. Prerequisite: General chemistry, including qualitative analysis. The first semester of this course is repeated in the second semester. Lab. fee and deposit, 3 or 4 cr., $20.00; 5 cr., $25.00. Lecture 9 TT; 6-9 hrs. lab. Mr. Hall, and staff.

12. Quantitative Analysis. I; 3 cr. For agricultural students only. Prerequisite: General chemistry, including qualitative analysis. Lab. fee and deposit $20.00. Lecture 1:30 Tu; 5 hrs. lab. Mr. Meloche and staff.

14. Quantitative Analysis. I; 5 cr. For engineering students only. Prerequisite: General chemistry, including qualitative analysis. Lab. fee and deposit $25.00. Lecture 9 TT; 7 hrs. lab. Mr. Meloche and staff.

15. Quantitative Analysis. II; 2 cr. For pharmacy students only. Lab. fee and deposit $15.00. Lecture 1:30 Tu; 5 hrs. lab. Mr. Meloche and staff.

17. Survey of Chemistry: Nature of the Chemical World. II; 3 cr. A brief course designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Open to all students, excepting those who have taken a more extended introductory course in chemistry. Lecture, demonstration, and discussion. Time and instructor to be announced.

20. Organic Chemistry. I, II; 2 cr. Prerequisite: Chemistry 1 or 2. An introductory course for students who do not have the time required for Chemistry 120, or who do not require so extensive a course. Courses 20 and 21 should be taken concurrently. Lecture 8 MWF. Mr. McElvain, Mr. Klein, and staff.

21. Organic Chemistry. I, II; 2 cr. Prerequisite: Credit or concurrent registration in Chemistry 20. Lab. fee and deposit $20.00. Lab. 6 hrs. Mr. McElvain, Mr. Klein, and staff.

30. Physical Chemistry. II; 3 cr. For chemical engineering students. Lab. fee and deposit $15.00. Lecture 11 TT; lab. Mr. Williams, Mr. Roseveare, and staff.

99. Special Chemical Problems. I, II; 2-4 cr. Lab. fee $5.00 per credit. Staff.

100. Senior Thesis. Yr; 3 cr. Lab. fee and deposit, $20.00 per semester. Staff.

106. Advanced Analytical Practice. Yr; 2-5 cr. A continuation of Chemistry 11. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit. Mr. Hall, Mr. Meloche.

107. History of Chemistry. I; 2 cr. Prerequisite: Chemistry 11, 120, or concurrent registration. Lecture 9 MW. Mr. Kahlenberg.

108. Advanced Qualitative Analysis. II; 2-5 cr. Prerequisite: Chemistry 1. Lab. fee and deposit, $15.00; $5.00 per additional credit. Mr. Krauskopf.

113. Water Analysis. II; 1 cr. Prerequisite: Chemistry 11 or consent of instructor. Lab. fee and deposit, $7.50. Lecture and lab. 8-12 S. Eight-week course Mr. Schuette.

116. Industrial Organic Analysis. I, II; *cr. Prerequisites: Chemistry 11 and one semester of organic chemistry. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit. Mr. Schuette.

117. Inorganic Preparations. I, II; 2-5 cr. Prerequisite: Chemistry 1b or 2b. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit.

118. Iron and Steel Analysis. I, II; 2-5 cr. Prerequisite: Chemistry 11 or 14. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit.

119. Organic Analysis. I; 3 cr. Prerequisites: Chemistry 11 and one semester of organic chemistry. Lab. fee and deposit, $20.00. Lecture 8 MW; lab. 1:30-4:30 MW. Mr. Schuette.

120. Organic Chemistry. Yr; 2 cr. Prerequisite: Chemistry 1 or 2. Courses 120 and 121 should be taken concurrently. Lecture 8 TT; quiz. Mr. Fischer and staff.

121. Organic Chemistry. Yr; 1-3 cr. Prerequisite: Credit or concurrent registration in Chemistry 120. Lab. fee and deposit, 1 cr. $15.00; $5.00 per additional credit. Lab. 3 to 8 hrs. Mr. Fischer and staff.

123. Characterization of Organic Compounds. I; 3 cr. Prerequisites: Chemistry 120 and 121. A study of homologous reactions, separation, and identification of organic compounds. Designed as an aid to research involving organic compounds. Lab. fee and deposit, $15.00. Conference 1:30 T; lab. 1:30-5:30 TT. Mr. McElvain.

124. Advanced Survey of Organic Chemistry. Yr; 2 cr. Prerequisite: Chemistry 120. Lecture 10 TT. Mr. Adkins.

125. Advanced Organic Preparations. Yr; *cr. Prerequisite: Chemistry 121. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit. Mr. Fischer, Mr. Adkins, Mr. McElvain, Mr. Klein.

126. Chemistry of Coal-Tar Dyes. I; 2 cr. Prerequisite: Chemistry 120. Given when demand warrants. Lecture 4:30 MW. Mr. Fischer.

130. Physical Chemistry. Yr; 2 cr. Prerequisites: Chemistry 1 and 11, Physics 1 or 31; Chemistry 10 or calculus, or concurrent registration in either, or consent of instructor. Courses 130 and 131 should be taken concurrently. Lecture 11 MWF. Mr. Mathews, Mr. Daniels, Mr. Roseveare, and staff.

131. Physical Chemistry. Yr; 1-3 cr. Prerequisite: Credit or concurrent registration in Chemistry 130. Lab. fee and deposit, 1 cr. $15.00; $2.50 per additional credit. Lab. 3 to 8 hrs. Mr. Mathews, Mr. Daniels, Mr. Roseveare, and staff.

132. Thermal Chemistry. I; 2 cr. Prerequisites: Chemistry 130 and 131. Offered 1933-34 and in alternate years. Lecture 9 TT. Mr. Mathews.

133. Photo-Chemistry. I; 2 cr. Prerequisites: Chemistry 130 and 131. Offered 1932-33 and in alternate years. Lecture 9 TT. Mr. Mathews.

134. Electro-Chemistry. II; 2 cr. Prerequisites: Chemistry 130 and 131. Offered 1933-34 and in alternate years. 9 TT. Mr. Roseveare.

135. Chemistry of Solutions. II; 2 cr. Prerequisite: Chemistry 130. Lecture 9 MW. Mr. Kahlenberg.

136. Relation of Physical Chemistry to Other Sciences. II; 2 cr. Prerequisite: Chemistry 130. Given when demand warrants. Mr. Kahlenberg.

142. Atomic Structure. II; 2 cr. Prerequisite: Chemistry 130. Offered 1933-34 and in alternate years. 8 TT. Mr. Daniels.

143. Molecular Structure. II; 2 cr. Prerequisite: Chemistry 130. Offered 1932-33 and in alternate years. Mr. Roseveare.

146. Chemistry of Foods and Their Adulterations. II; 2 cr. Prerequisites: Chemistry 11a and 20. Lecture 10 MWF. Mr. Schuette.

147. Chemistry of Foods and Their Adulterations. II; 1-3 cr. Prerequisite: Credit or concurrent registration in Chemistry 146. Lab. fee and deposit, 1 cr. $10.00; $5.00 per additional credit. Lab. 3 to 9 hrs. Mr. Schuette.

148. Introduction to Physical and Colloid Chemistry. I; 3-5 cr. Particularly for students in the biological sciences. Lab. fee and deposit, 1 cr. $15.00; 2 cr. $17.50. Prerequisite: Consent of instructor. Lecture 8 MWF. Mr. Williams and staff.

149. Colloid Chemistry. Yr; 2 cr. Prerequisites: Chemistry 130 and 131. Lecture 11 MW. Mr. Williams.

151. Advanced Inorganic Chemistry. Yr; 2 cr. Offered 1932-33 and in alternate years. Lecture 11 TT. Mr. Hall.

155. Advanced Quantitative Analysis. Yr; 2 cr. Offered 1933-34 and in alternate years. Lecture 11 TT. Mr. Hall.

161. The Phase Rule. I; 2 cr. Offered 1933-34 and in alternate years. Prerequisite: Chemistry 130. Mr. Sorum.

162. Chemical Dynamics. I; 2 cr. Offered 1932-33 and in alternate years. Mr. Sorum.

200. Research in Organic Chemistry. Yr; *cr. Mr. Fischer, Mr. Adkins, Mr. McElvain, Mr. Klein.

201. Research in General Chemistry. Yr; *cr. Mr. Kahlenberg. Mr. Walton, Mr. Krauskopf, Mr. Calderwood, Mr. Sorum, Mr. Hazel, Mr. Holt.

202. Research in Physical Chemistry. Yr; *cr. Mr. Mathews, Mr. Daniels, Mr. Roseveare.

203. Research in Foods and Sanitation. Yr; *cr. Mr. Schuette.

205. Research in Colloid Chemistry. Yr; *cr. Mr. Williams

206. Research in Inorganic Chemistry. Yr; *cr. Mr. Hall, Mr. Meloche.

209. Lives of Great Chemists. II; 2 cr. Offered when demand warrants. Mr. Kahlenberg.

224. Advanced Organic Chemistry. 2 cr. Prerequisite: Chemistry 120. A cycle of four semesters which students may enter any semester. 7 p. m. TT. Mr. Fischer.

238. Chemical Seminary. Yr; 1 cr. 4:30 W. Mr. Kahlenberg, Mr. Calderwood, Mr. Holt.

239. Seminary in Physical Chemistry. Yr; 1 cr. Prerequisite: Chemistry 130. 7:15 p. m. M. Mr. Mathews, Mr. Daniels, Mr. Roseveare.

244. Thermodynamics. II; 2 cr. Prerequisites: Chemistry 130 and calculus. Offered 1932-33 and in alternate years. 8 TT. Mr. Daniels.

247. Seminary in Organic Chemistry. Yr; 1 cr. 10 W. Mr. Fischer, Mr Adkins, Mr. McElvain, Mr. Klein.

250. Seminary in Colloid Chemistry. Yr; 1 cr. Prerequisite: Consent of instructor. 4:30 F. Mr. Williams.

252. Seminary in Inorganic Chemistry. Yr; 1 cr. Mr. Hall, Mr. Meloche,

254. Seminary in Foods and Sanitation. Yr; 1 cr. Mr. Schuette.

263. Seminary in General Chemistry. Yr; 1 cr. Mr. Walton, Mr. Krauskopf, Mr. Sorum.

TEACHERS' COURSE

The Teaching of Chemistry. See School of Education.

CLASSICS

Arthur Gordon Laird, Ph.D., *Professor of Greek, Chairman*
Walter Raymond Agard, B.Litt., *Professor of Greek*
Grant Showerman, Ph.D., *Professor of Classics*
Alban Dewes Winspear, M.A., *Associate Professor of Classics*
John Paul Heironimus, Ph.D., *Assistant Professor of Classics*
John Jacob Schlicher, Ph.D., *Assistant Professor of Latin*

Major. In Greek, 28 credits, exclusive of Greek 1; in Latin, 28 credits exclusive of Latin 1-4 but including ten credits in courses of the 100 group. Seniors who, in the judgment of the department, have shown the ability to profit thereby, may elect to write a thesis in lieu of four credits of advanced reading.

For teaching major see School of Education.

GREEK

1. Elementary Greek. Yr; 4 cr. Study of forms and syntax, with translation and easy prose composition. Selections from Xenophon's *Anabasis*. 1:30 MTTF. Mr. Laird.

7. Xenophon and Prose Composition. Yr; 3 cr. Prerequisite: Greek 1. Mr. Agard.

10. Homer and Plato. Yr; 3 cr. *Iliad, Apology, Crito.* Prerequisite: Greek 7, or a grade of B in Greek 1. 11 MWF. Mr. Laird.

20. Greek Drama and Lyric Poetry. Yr; 3 cr. During the first semester selections from the lyric poets and Aristophanes will be read. Euripides' *Medea* and Sophocles' *Antigone* will be read in the second semester. Prerequisite: Greek 10. 1:30 MWF. Mr. Agard.

100. Senior Thesis. Yr; 2 cr.

106. Herodotus and Thucydides. Yr; 3 cr. A study of the sources for Greek fifth-century history by means of reading, essays, and lectures. Prerequisite: Greek 20 or concurrent registration. Offered 1933-34 and in alternate years. 1:30 MWF. Mr. Winspear.

108. Plato. Yr; 3 cr. Prerequisite: Greek 20 or concurrent registration. Not offered 1932-33. Mr. Winspear.

109. Aristotle. Yr; 3 cr. The *Nicomachean Ethics* and selected passages from the *Politics* and *Metaphysics*. Prerequisite: Greek 108 or consent of the instructor. 10 TTS. Mr. Winspear.

110. Advanced Greek Composition. Yr; 1 cr. Prerequisite: Greek 20. Mr. Laird.

112. Classical Life and Letters. Yr; 1-3 cr. A general survey of ancient civilization; the life of the Greeks and Romans as seen in their literature and monuments. First semester, Greece; second semester, Rome. The course deals with the most famous Greek and Roman sites, is illustrated, and has a travel and archaeological interest. Prerequisite: Full sophomore standing. 9 MWF. Mr. Showerman.

122. Classical Art and Archaeology. II; 3 cr. A general survey of the architecture, sculpture, and painting of Greece and Rome, with travel background. The history of the various arts is continued up to the Renaissance, and in the case of architecture up to the present time. Prerequisite: Full sophomore standing. Offered 1933-34 and in alternate years. Mr. Showerman.

180. Directed Reading for Seniors. A limited number of credits can be arranged for work done on the tutorial or honors system by seniors whose previous records have been satisfactory. Students who wish to arrange any part of their work in this way should consult the appropriate instructor and the chairman of the department before the end of the junior year.

211. Greek Drama. Yr; 3 cr. Two plays each of Aeschylus, Sophocles, Euripides, and Aristophanes, with lectures and directed readings in the history of the Greek drama. Prerequisite: Graduate standing. Mr. Agard.

215. Pindar. I; 3 cr. Prerequisite: Graduate standing. Not offered 1932-33. Mr. Agard.

226. Greek Sounds and Forms. Yr; 2 cr. Offered 1932-33 and in alternate years. Mr. Laird.

230. Greek Seminary. Yr; 2 cr. The subject varies from year to year. In 1932-33 it will be Thucydides. Prerequisite: Graduate standing. 10-12 S. Mr. Laird.

LATIN

1. ELEMENTARY LATIN. I, II; 5 cr. The elements of the language, including forms and syntax, with simple translation into Latin and English, equivalent to a full year of high-school work, and preparatory to reading Caesar in the second semester. First semester: 8, 10 M—F. Second semester: 8 M—F.

2. CAESAR. I, II; 5 cr. The equivalent of the second year of high-school Latin. The reading of selections from the seven books of the *Gallic War*. Composition once a week. Prerequisite: Latin 1 or one year of high-school Latin. First semester: 9 M—F. Second semester: 8, 10 M—F. Mr. Heironimus.

3. CICERO. I, II; 4 or 5 cr. Four of the shorter orations, or an equivalent amount selected from the orations and letters. Composition one day a week for those who take the course for five credits. Prerequisite: Latin 2 or two years of high-school Latin. First semester: 10 M—F. Second semester: 9 M—F. Mr. Schlicher.

4. VIRGIL. I, II; 4 or 5 cr. The parts read are taken from the first six books of the *Aeneid*. As in Latin 3, one day a week is given to composition for those who take the course for five credits. Prerequisite: Latin 3 or three years of high-school Latin. First semester: 2:30 M—F. Second semester: 10 M—F. Mr. Agard.

5. SALLUST. II; 4 cr. This course follows immediately upon Latin 4. The reading consists of the *Jugurthine War*, with composition once a week. Prerequisite: Latin 4 or four years of high-school Latin. 2:30 MTTF. Mr. Heironomius.

6. TERENCE, PLINY, LIVY, CATULLUS. Yr; 4 cr. In the first semester a play of Terence and selected Letters of Pliny; in the second semester, selections from Livy and Catullus, with prose composition once a week. Prerequisite: Latin 4 or four years of high-school Latin. 8 MTTF, Mr. Heironimus. A second section, designed for those students who purpose taking only one year of college Latin, takes the form of a survey of Latin literature. Selections from the leading poets are read in the first semester, and from prose writers in the second semester. 9 MTTF. Mr. Winspear.

7. HORACE AND POETRY SURVEY. Yr; 3 or 4 cr. In the first semester, the Odes; in the second, select Satires and Epistles, and a general survey of Latin poetry. The fourth hour will be devoted to Latin composition. Prerequisite: Latin 6. 8 MTWF. Mr. Showernman, Mr. Winspear.

10. CLASSICAL MYTHOLOGY. I; 1 or 2 cr. For one credit, text book and illustrated lectures. For two credits, the same with the addition of outside reading in English. A knowledge of Latin is not required. Prerequisite: Full sophomore standing. Offered 1933-34 and in alternate years. 9 TT. Mr. Agard.

100. SENIOR THESIS. Yr; 2 cr.

101. ADVANCED LATIN COMPOSITION. I; 2 cr. Written and oral translation into Latin sentences and connected passages, with a survey of Latin grammar. Prerequisite: Latin 7 (with composition). 9 TT. Mr. Schlicher.

102. Advanced Latin Composition. II; 2 cr. More advanced exercises in connected discourse. Especial attention given to the differences between Latin and English in sentence structure and idiom. Prerequisite: Latin 101. 9 TT. Mr. Schlicher.

105. Pliny and Martial. II; 3 cr. Selected letters of Pliny and epigrams of Martial are read, with special attention to the various phases of Roman life reflected in them. Prerequisite: Latin 7. Not offered 1932-33. Mr. Heironimus.

106. Roman Elegiac Poets. II; 3 cr. Selections from Tibullus, Propertius, and Ovid. Lectures and assigned reading on the Augustan age. Prerequisite: Latin 7. Mr. Heironimus.

108. Cicero's Letters. I; 3 cr. The life, times, and works of Cicero, with readings from the letters. Prerequisite: Latin 7. Offered 1933-34 and in alternate years. Mr. Showerman.

109. Roman Drama. II; 3 cr. Selected comedies of Plautus and Terence. Lectures and assigned reading on the history of classical drama and its influence. Prerequisite: Latin 7. Offered 1933-34 and in alternate years. Mr. Showerman.

110. Lucretius. II; 3 cr. As much as possible of the *De Rerum Natura,* with background of the history of philosophy in Greece and Rome. Prerequisite. Latin 7. Offered 1932-33 and in alternate years. 10 MWF. Mr. Showerman.

111. Virgil. I; 3 cr. A review of the works of Virgil, with special attention to the literary art of the *Aeneid.* Prerequisite: Senior standing. 10 MWF. Mr. Showerman.

112. Classical Life and Letters. (See Greek 112.)

115. Roman Biography. I; 3 cr. Suetonius, lives of Caesar and Augustus, the *Agricola* of Tacitus, and several biographies of Nepos and the *Historia Augusta* are read, either in class or privately. Attention is given to ancient biography as a type, and to the use made of it in other fields. Prerequisite: Latin 7. Offered 1933-34 and in alternate years. Mr. Heironimus.

118. Roman Satire. I; 3 cr. Selected satires of Horace, Persius, and Juvenal. Study of satire as a literary *genre.* Lectures and assigned reading on the social conditions at Rome in the time of the Empire. Prerequisite: Latin 7. 11 MWF. Mr. Heironimus.

119. Tacitus. I; 2 cr. The principate of Tiberius and Augustus is studied by lectures, recitations, and reports. Prerequisite: Latin 7. Offered 1932-33 and in alternate years. 11 TT. Mr. Winspear.

120. Historians of the Republic. II; 3 cr. Selections from Livy, Sallust, and Caesar's *Civil War.* Study of Roman senatorial government and its overthrow. Prerequisite: Latin 7. Offered 1933-34 and in alternate years. Mr. Schlicher.

121. Cicero's Philosophical Essays. II; 2 cr. An introduction to Roman philosophy. Lectures on the background of Greek thought. Prerequisite: Senior standing. 11 TT. Mr. Winspear.

122. Classical Art and Archaeology. (See Greek 122.)

130. Medieval Latin. Yr; 2 cr. Offered 1933-34 and in alternate years. Mr. Heironimus.

180. Directed Reading for Seniors. (See Greek 180.)

207. Latin Prose for Graduates. Yr; 1 cr. Mr. Winspear.

213. Cicero. I; 3 cr. Several of the longer orations and selections from the rhetorical and philosophical works, designed to give a comprehensive view of Cicero's literary activity. Not offered 1932-33. Mr. Schlicher.

225. Latin Sounds and Forms. Yr; 2 cr. Lectures on the history of Latin sounds and forms and their relation to those of other languages, supplemented by reports and class discussion. Offered 1933-34 and in alternate years. 10 TT. Mr. Laird.

226. Problems in Latin Syntax. II; 3 cr. Introduction to the study of syntax and investigation of specific problems of case, mood, tense, and word order. 2:30-4 MW. Mr. Schlicher.

230. Literature of the Late Empire. I; 3 cr. A survey of the two literatures, Pagan and Christian, from the early second century to the fall of Rome. Special studies of Minucius Felix and Apuleius. Not offered 1932-33. Mr. Showerman.

231. Latin Literature. I; 3 cr. A general survey, combined with the reading of selected works or illustrative passages from the various authors, and a consideration of their antecedents and relationships. Subject for 1932-33, the Republic; for 1933-34 the Early Empire. 2:30-4 MW. Mr. Schlicher.

233. Latin Seminary. Yr; 2 cr. The work varies from year to year, according to the author or subject taken up. All seminaries, however, deal with the principles of textual criticism, as well as with literary, rhetorical, and historical interpretation. In 1931-32 the subject was Tacitus and the historical problems of the Early Empire, under direction of Mr. Winspear. In 1932-33 the author will be Lucretius, with Mr. Leonard in charge. 1:30-3:30 Th.

TEACHERS' COURSE

The Teaching of Latin. See School of Education.

COMPARATIVE LITERATURE

PHILO MELVIN BUCK, JR., M.A., *Professor of Comparative Literature, Chairman*
WALTER RAYMOND AGARD, B.Litt., *Professor of Greek*
ROBERT ELKIN NEIL DODGE, M.A., *Professor of English*
ALEXANDER RUDOLPH HOHLFELD, Ph.D., *Professor of German* (on leave I)
BAYARD QUINCY MORGAN, Ph.D., *Professor of German*
JAMES FRANCIS AUGUSTINE PYRE, Ph.D., *Professor of English*
GRANT SHOWERMAN, Ph.D., *Professor of Classics*
CASIMIR DOUGLASS ZDANOWICZ, Ph.D., *Professor of French* (on leave II)
HYMAN CHONON BERKOWITZ, Ph.D., *Associate Professor of Spanish*
PAUL MILTON FULCHER, Ph.D., *Associate Professor of English*
RICARDO BECKWITH QUINTANA, Ph.D., *Associate Professor of English*
JOSEPH LOUIS RUSSO, Ph.D., *Associate Professor of Italian*
EINAR HAUGEN, Ph.D., *Assistant Professor of Scandinavian Languages*
ROBERT BELL MICHELL, Ph.D., *Assistant Professor of French*
JULIA GRACE WALES, Ph.D., *Assistant Professor of English*

Courses in comparative literature fall into two general classes: those in which the readings are mainly in English translation, and those in which an easy reading knowledge of one or more foreign literatures is required. Undergraduates majoring in the department must be able to do a portion of this work in at least one language other than English. There is also provision for graduate work in comparative literature, as outlined in the bulletins of the Graduate School. None of the courses in this department is open to freshmen.

MAJOR. The major in Comparative Literature is planned for those students who may be interested in the critical appreciation of literature or who may have literary ambitions; it will be found to be elastic enough to suit individual needs. The minimum requirements of the major are 46 credits, including the following:

(a) 16 credits in courses in the Department of Comparative Literature, including Course 9 and four or more credits from courses numbered over 100, not including 112.

(b) 14 credits in literature (not language or composition) courses in at least two other departments, one of which may be English. Not less than 9 of these credits shall be taken in one foreign literature, ancient, Romance, or German. Courses in the language departments below the following numbers are not accepted as part of the major: Latin 6, Greek 7 or 10, English 34, French 21, German 20, Spanish 21, Italian 20.

(c) 12 credits in related courses in at least two of the following departments: art history, philosophy, history.

(d) 4 credits of thesis.

An elementary course in psychology is usually recommended.

It is further required that the completed work show a degree of continuity; that is to say, the elections will necessarily be in the same or related periods of literary history, or will include the same or similar literary types. The exact grouping of courses for a major will be determined individually for each student.

In any of the possible coordinations of his work the Department of Comparative Literature asks the student so to plan his studies that in his senior year he can do a piece of original work in which the result of this survey of a period or related periods will be manifest. The student, if he has the ability, can register for such original work in addition to the thesis, for which purpose the proseminary (180) is designed.

9. World Literature in Translation. Yr; 3 cr. Homer to the 19th century. 9 MW or 9 TT and one additional hour. Mr. Buck and staff.

10. Classical Mythology. I; 1 or 2 cr. For one credit, text book and illustrated lectures. For two credits, the same with the addition of outside reading in English. A knowledge of Latin is not required. Offered 1933-34 and in alternate years. 9 TT. Mr. Agard.

48. Literary Aspects of the English Bible. I; 3 cr. 10 MWF. Miss Wales.

50. French Masterpieces in Translation. Yr; 2 cr. No language prerequisite. 10 TT. Mr. Michell.

53. Italian Masterpieces in Translation. Yr; 2 cr. Lectures, class discussions, assigned reading. The first semester is devoted to Dante, Petrarch, and Boccaccio; the second semester begins with the Renaissance authors and ends with Pirandello. No language prerequisite. 10 TT. Mr. Russo.

55. Spanish and Portuguese Masterpieces in Translation. Yr; 2 cr. A review of the significant traits of Hispanic literatures, and of their relationship to other literatures, from the origins up to the present time; illustrated with selected representative masterpieces. Lectures, class discussions, and supplementary readings. No language prerequisite. 9 TT. Mr. Berkowitz.

67. Contemporary Drama. Yr; 2 cr. Offered 1931-32 and in alternate years. In translation. 11 TT. Mr. Pyre.

68. Contemporary Novel. Yr; 2 cr. The English, Continental, and American novel, 1875-1930, in translation. Offered 1932-33 and in alternate years. 9 TT. Fulcher.

72. Philosophy of Literature. I; 3 cr. Offered 1931-32. Mr. Lyons.

75. German Classics in Translation. Yr; 2 cr. A study of selected masterpieces of German literature, taken up entirely in English. Lectures, assigned reading, discussions, and topics. The first semester begins with the *Nibelungenlied* and ends with Schiller; the second semester begins with Goethe and comes down to modern times. Offered 1932-33 and in alternate years. 2:30 TT. Mr. Morgan.

77. Modern Norwegian Literature. I; 3 cr. Lectures and readings in English. The eighteenth century (Ludvig Holberg, the "Molière of the North"); the national renascence of the early nineteenth century (Wergeland, Welhaven; romanticism; the classic age of Ibsen and Bjørnson; the democratic victory, realism and naturalism, 1870-1890; neo-romanticism; the newer psychology. Prerequisite: Junior standing. 8 MWF. Mr. Haugen.

78. Ibsen's Social and Psychological Dramas. II; 3 cr. Lectures and readings in English. Ibsen's later plays, significance in world literature. Prerequisite: Junior standing. 8 MWF. Mr. Haugen.

100. Senior Thesis. Yr; 2 cr.

102. Renaissance Epic. II; 2 cr. The epic form after Virgil; Ariosto, Tasso (in translation); Spenser, Milton. Offered 1932-33 and in alternate years. 3:30 TT. Mr. Dodge.

103. Renaissance Thought. II; 3 cr. 11 MWF. Offered 1933-34 and in alternate years. Mr. Quintana.

109. Nineteenth-Century Literature in Translation. II; 3 cr. A sequel to Comparative Literature 9. 11 TT and one additional hour. Mr. Buck.

112. Classical Life and Letters. Yr; 1-3 cr. A general survey of ancient civilization; the life of the Greeks and Romans as seen in their literature and monuments. First semester, Greece; second semester, Rome. The course deals with the most famous Greek and Roman sites, is illustrated, and has a travel and archaeological interest. Offered 1932-33 and in alternate years. 9 MWF. Mr. Showerman.

141. Principles and Practice of Translation. II; 1 or 2 cr. For students with advanced training in French, German, Italian, or Spanish. Lectures on the principles of translation; detailed criticism of various types of translated material; original exercises in translation. The second credit is earned by a topic. Offered 1933-34 and in alternate years. Mr. Morgan.

165. Literary Criticism. Yr; 3 cr. The search for a critical theory. One foreign language required, except for English majors. 10 MWF. Mr. Buck.

170. Literary Type: Tragedy. Yr; 2 cr. A critical study. At least one foreign language required. Offered 1932-33 and in alternate years. 2:30 TT. Mr. Buck.

171. Literary Type: Comedy. Yr; 2 cr. A critical study. At least one foreign language required. Offered 1933-34 and in alternate years. 2:30 TT. Mr. Buck.

176. The Romantic Movement in France, Germany, and England. Yr; 2 cr. From Rousseau to Goethe and Chateaubriand. Ability to read German and French necessary. Offered 1933-34 and in alternate years. Mr. Buck.

177. Renaissance Satire. I; 3 cr. 10 MWF. Offered 1933-34 and in alternate years. Mr. Quintana.

180. Proseminary. Yr; *cr. Individual studies made by students under the direction of the instructor. Thesis students and others wishing to do original work will register for this course. Mr. Buck.

201. Seminary in Literary Criticism. Yr; 1-2 cr. Mr. Buck.

250. The Renaissance in France. Yr; 2 cr. A study of the development of the Renaissance spirit and its main manifestations in France, with special study of some representative sixteenth-century author. Offered 1933-34 and in alternate years. Mr. Zdanowicz.

COMPARATIVE PHILOLOGY

(INDO-EUROPEAN)

ARTHUR GORDON LAIRD, Ph.D., *Professor of Greek, Chairman*
ALFRED SENN, Ph.D., *Professor of Germanic and Indo-European Philology*

101. INTRODUCTION TO COMPARATIVE INDO-EUROPEAN LINGUISTICS. I; 3 cr. Not offered 1932-33. Mr. Senn.

140. ELEMENTARY SANSKRIT. II; 2 cr. Offered 1933-34 and in alternate years. Mr. Senn.

141. ADVANCED SANSKRIT. I; 2 cr. Offered 1932-33 and in alternate years. Mr. Senn.

154. GOTHIC. I; 2 cr. Offered 1933-34 and in alternate years. Mr. Senn.

170. INTRODUCTION TO SLAVONIC PHILOLOGY: OLD CHURCH SLAVONIC. II; 2 cr. Offered 1933-34 and in alternate years. Mr. Senn.

172. INTRODUCTION TO BALTIC PHILOLOGY: LITHUANIAN. II; 2 cr. Offered 1932-33 and in alternate years. Mr. Senn.

225. LATIN SOUNDS AND FORMS. Yr; 2 cr. Offered 1933-34 and in alternate years. Mr. Laird.

226. GREEK SOUNDS AND FORMS. Yr; 2 cr. Offered 1932-33 and in alternate years. Mr. Laird.

250. SEMINARY: COMPARATIVE INDO-EUROPEAN LINGUISTICS. Yr; 2 cr. Mr. Senn.

For other courses in comparative philology, see English 120-123, 185, 227; French 240, 244; Italian 171; German 155, 158, 161, 269, 270; Scandinavian 108; Spanish 210, 273.

DRAWING

HERBERT DENNY ORTH, B.S., *Associate Professor of Drawing and Descriptive Geometry, Chairman*
ADAM VAUSE MILLAR, M.S., *Professor of Drawing and Descriptive Geometry*
JOSEPH DOW LIVERMORE, B.S., *Assistant Professor of Drawing and Descriptive Geometry*
KENNETH GRINNELL SHIELS, M.S., *Assistant Professor of Drawing and Descriptive Geometry*
HOWARD BAILEY DOKE, *Instructor in Drawing and Descriptive Geometry*

These courses are offered by the Department of Drawing and Descriptive Geometry in the College of Engineering. Starred courses (★) do not count toward the 120 credits required for graduation from the general courses in the College of Letters and Science. See Art Education, page 100, for free-hand drawing courses.

1. ELEMENTS OF DRAWING. I, II; 3 cr. Working drawings, third-angle projection, lettering, tracing, and blueprinting. Open to freshmen. Two sections especially adapted to non-engineering students; 10-12 MWF and 10-12 TTS. Lab. fee $1.00. Mr. Livermore, Mr. Moulton.

2. Elements of Drawing. I, II; 3 cr. Working drawings, lettering, sketching, isometric, and cabinet drawing. Prerequisite: Drawing 1. Lab. fee $1.00. Mr. Orth and staff.

3. Descriptive Geometry. I, II; 3 cr. Fundamental theory of point, line, and plane, with application to solids. Generation and classification of lines and surfaces; tangent planes; sections, intersections, and developments. Prerequisite: Drawing 2. Mr. Millar, Mr. Orth, Mr. Shiels, Mr. Livermore.

*7. Freehand Lettering. I, II; 1 or 2 cr. Construction and composition of Classic Roman capitals, lower-case letters, English Gothic, black letter, and modern script. Special emphasis given to the choice of lettering styles in advertising design. Lab. fee $0.75. 8-10 TT or 10-12 MW. Mr. Doke.

*8. Advanced Freehand Lettering. I, II; 2 cr. Continuation of Course 7, which is prerequisite. Lab. fee $0.75. 10-12 TT. Mr. Doke.

*9. Advanced Freehand Lettering. I, II; 2 cr. Continuation of Course 8, which is prerequisite. Lab. fee $0.75. 10-12 TT. Mr. Doke.

ECONOMICS

Harry Jerome, Ph.D., *Professor of Economics, Chairman*
Robert Ray Aurner, Ph.D., *Professor of Business Administration*
John Rogers Commons, M.A., LL.D., *Professor of Economics*
Fayette Herbert Elwell, B.A., C.P.A., *Professor of Accounting*
Martin Gustav Glaeser, Ph.D., *Professor of Economics*
Benjamin Horace Hibbard, Ph.D., *Professor of Agricultural Economics*
Asher Hobson, Ph.D., *Professor of Agricultural Economics*
William Henry Kiekhofer, Ph.D., *Professor of Economics*
Don Divance Lescohier, Ph.D., *Professor of Economics*
Chester Lloyd Jones, Ph.D., *Professor of Economics and Political Science*
Preston Essex McNall, M.S., *Professor of Agricultural Economics*
Selig Perlman, Ph.D., *Professor of Economics*
William Amasa Scott, Ph.D., LL.D., *Professor of Economics, Emeritus*
Henry Roscoe Trumbower, Ph.D., *Professor of Economics*
George Simon Wehrwein, Ph.D., *Professor of Agricultural Economics*
Arthur Joseph Altmeyer, Ph.D., *Lecturer in Economics*
Edwin Emil Witte, Ph.D., *Lecturer in Economics*
Donald Ross Fellows, M.A., *Associate Professor of Business Administration*
Philip Gorder Fox, M.A., *Associate Professor of Business Administration*
John Currie Gibson, B.A., *Associate Professor of Accounting*
Harold Martin Groves, Ph.D., *Associate Professor of Economics*
Walter Albert Morton, Ph.D., *Associate Professor of Economics*
W. Bayard Taylor, Ph.D., *Associate Professor of Finance*
Henry Harrison Bakken, M.A., *Assistant Professor of Agricultural Economics*
Irene Hensey, M.S., *Assistant Professor of Accounting*
William Peter Mortenson, M.S., *Assistant Professor of Agricultural Economics*
Margaret Pryor, Ph.D., *Assistant Professor of Economics*
Paul Raushenbush, M.A., *Assistant Professor of Economics*
Elizabeth Brandeis, Ph.D., *Instructor in Economics*
Alma Louise Bridgman, M.A., *Instructor in Economics, Executive Secretary*
Carey Kierstead Ganong, Ph.D., *Instructor in Economics*
Angeline Genevieve Lins, B.A., *Instructor in Accounting*
Marvin Arnold Schaars, M.A., *Instructor in Agricultural Economics*

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EDUCATIONAL PSYCHOLOGY

109. Modern Systems of Psychology and Education. I; 3 cr. A critical comparison of the more important viewpoints in present-day psychology, such as behaviorism, psycho-analysis, gestalt psychology, functionalism, together with the study of their effect upon present educational movements, i.e., individualized instruction, nursery schools, adult education, use of intelligence tests, etc. Prerequisite: Education 41 or consent of instructor. 10 MWF. Mr. Ragsdale.

118. Psychology of Adolescence. I, II; 3 cr. Mr. Jensen.

121. Physical Development. II; 2 cr. Physical development from birth to maturity, showing the bearing of the physical changes during childhood upon the principles of education. 1:30 MW. Mr. Ragsdale.

123. Psychology and Training of the Pre-School Child. I, II; 2 cr. A study of the development and education of children from infancy to the fifth year. 2:30-4:30 Th. Mr. Jensen.

219. Seminary, Child Development. Yr; 2 cr. Mr. Jensen.

ENGLISH

Robert Elkin Neil Dodge, M.A., *Professor of English, Chairman*
Arthur Beatty, Ph.D., *Professor of English*
Henry Burrowes Lathrop, B.A., *Professor of English*
William Ellery Leonard, Ph.D., *Professor of English*
James Francis Augustin Pyre, Ph.D., *Professor of English*
Frederick William Roe, Ph.D., Litt. D., *Professor of English*
Warner Taylor, M.A., *Professor of English*
Robert West, Ph.D., *Professor of Speech Pathology*
[illegible] B. Cairns, Ph.D., *Associate Professor of American Literature*
[illegible] Fulcher, Ph.D., *Associate Professor of English*
160. [illegible] Hanley, M.A., *Associate Professor of English* (on leave

161. Literature [illegible] Ph.D., *Associate Professor of English*
[illegible] historical [illegible] *er in English*
Harry Gl[illegible] 1745-98. [illegible] *Professor of English*
Harry Hayden C[illegible] *Professor of English*
Charles Wright Thom[illegible] *Assistant Professor of English*
Ethel Thornbury, Ph.D., *Assistan[illegible]fessor of English*
Julia Grace Wales, Ph.D., *Assistan[illegible]fessor of English*
Ruth C. Wallerstein, Ph.D., *Assistant Professor of English*
Helen Constance White, Ph.D., *Assistant Professor of English*

INSTRUCTORS

[illegible] Parker, M.A.
180. [illegible] B.Litt.
[illegible] first sem
185. Introduc[illegible]
William [illegible]
Charles Gordon [illegible] Eng.
Maxwell M. Freeman, M.A.
Charles Irwin Griggs, M.A.
Allan Gates Halline, M.A.
John Jacob Lyons, M.A.
Ernest Marchand, M.A.
Katherine McMullen, M.A.
Margaret I. Pope, M.A.
Macklin Thomas, M.A.
David H. Webster, M.A.
Malcolm L. Wilder, Ph.D.
Charlotte Robertson Wood, M.A.

MAJOR. In 1931 the English major was revised, partly to meet the new requirement of comprehensive examinations at the close of the senior year. Since the publication of this revised major, the inauguration of comprehensive examinations has been postponed. The department has been obliged, therefore, to modify its new plan, which will not be put into effect until the situation with regard to comprehensive examinations has been clarified.

The major at present consists of a minimum of 34 credits, including (a) freshman English; (b) one, and only one, of the following: 29, 30, 33; (c) one, and only one, of the following: 37, 136, 137; (d) two of the following, one of which must be either 31 or 57: 31, 57, 160, 161, 162; (e) not more than two of the following (one will suffice): 34, 35, 40; (f) a thesis or its equivalent.

The thesis, written in the senior year, is required of all students whose grades in English courses taken at the University of Wisconsin average B. Students of a lower grade must substitute four credits in courses of the one-hundred group, not including courses taken in fulfillment of requirements (c) and (d) above. No senior transfer may write a thesis unless his record at the institution from which he transfers convinces the chairman of the department that he has the requisite capacity.

Students intending to choose English as their major study are urged to complete the introductory course (30, 33, or 29) not later than the close of the sophomore year. Of these three courses that specially designed for English majors is 30, but either of the others will be accepted. Prospective majors should have done better than average work in their preliminary courses in English and in foreign languages. Students entering with advanced standing are generally required to earn 20 credits in English in residence at the University of Wisconsin.

HONORS. Students reading for honors in English will enter upon their work in the first semester of their junior year, under the direction of tutors. They will be expected to devote much of the following summer to assigned general reading and will continue the work through the senior year. Prerequisites: An age of 2.5 grade-points per credit for the first four semesters and recommendation of three of his sophomore instructors. Eve*nics, Emeritus* assigned to a special tutor. For further information co*mics*

TEACHING MAJOR AND MINOR. See Scho*gricultural Economics*
r in Economics
Economics
RHETORIC AND *Professor of Bu*
ofessor of

A. ENGLISH COMPOSITION. Three ho*rs* a week; no credit. For students who have failed to pass the preliminary test.

1a. FRESHMAN ENGLISH. I, II; 3 cr. Required of freshmen in all colleges. Mr. Taylor and staff; engineers under Mr. Thomas and staff.

1b. FRESHMAN ENGLISH. I, II; 3 cr. Continuation of English 1a. Requi*Economics* of all freshmen excepting those who receive a grade of A in*Economics* On the completion of this course, a provisional pass*Economics* subsequently a student is reported deficient *Economics* position, he may be required to take additio*ics* ject. Mr. Taylor and staff; engineers under Mr. Th*economics, Exec* Mr. Taylor and staff; engineers under Mr. Th*economics, Exec*
in Economi

2. INTERMEDIATE COMPOSITION. I, II; 2 cr. Prerequisite: English 1b. 2a, description and narration; 2b, exposition. Ten or more sections at various hours. Mr. Wilder and staff.

3. INTERMEDIATE COMPOSITION. Yr; 2 cr. For freshmen exempted from English 1, who may wish a course in composition and may prefer not to enter English 2. Limited enrollment. 11 MW. Mr. Taylor.

5. ADVANCED COMPOSITION. Yr; 2 cr. Prerequisite: Consent of instructor. 10 TT. Miss White.

6. ADVANCED COMPOSITION. Yr; 3 cr. Prerequisite: Junior standing. 11 TT. Mr. Dodge.

7. NARRATIVE COMPOSITION. Yr; 2 cr. Prerequisites: Junior standing and consent of instructor. 10 TT. Mr. Fulcher.

8. CRITICAL WRITING. Yr; 2 cr. Each member of the class takes up a particular author or topic as the center of his writing for the semester. Prerequisite: Consent of instructor. Not offered 1932-33. Miss Thornbury.

BUSINESS LETTERS AND REPORTS. See Economics 6.

INTRODUCTORY LITERATURE COURSES

Students may fulfill the B.A. requirement of 4-6 credits in literature by taking any one of three courses hereinafter described—29, 30, or 33. Whichever of these courses is once entered upon must be continued for two semesters; that is, a student may not shift from one course to another. Only one of the three courses may be credited toward a degree. No advanced course in English literature is open to students who have not taken one of these introductory courses.

29. ENGLISH HISTORY, ENGLISH LITERATURE. Yr; 5 cr. The historical part of this course will present an analysis of the successive social experiences of the English people; against this background the development of English literature is considered, the emphasis falling upon the great literary movements and their outstanding representatives. Satisfies the B.A. requirements of six credits in history and four credits in English literature. Open to freshmen exempt from English 1 and to sophomores. 9 M—F. Mr. Quintana, Mr. Gallogg.

160. THE ENGLISH LITERATURE. Yr; 3 cr. This course, the material in which is taken up in historical sequence, is designed for students who have a special interest in literature, and is recommended to sophomores who contemplate making English their major subject. 8, 10, 11, or 2:30 MWF. (First semester's work repeated in second semester, and second semester's work given during first semester, 2:30 MWF.) Mr. Pyre and staff.

161. LITERATURE OF THE ENGLISH LITERATURE. Yr; 3 cr. This course, the material in which is taken up in historical sequence, is designed for students who have a special interest in literature, and is recommended to sophomores who contemplate making English their major subject. 8, 10, 11, or 2:30 MWF. (First semester's work repeated in second semester, and second semester's work given during first semester, 2:30 MWF.) Mr. Pyre and staff.

33. INTRODUCTION TO ENGLISH LITERATURE. Yr; 2 cr. This course, the material in which is not taken up in historical order, is primarily a course in the appreciation of literature. It is provided especially for sophomores who are candidates for the general B.A. degree. 9, 10, or 11 TT. (First semester's work repeated in second semester and second semester's work given during first semester, 1:30 TT.) Mr. Beatty and staff.

180. INTRODUCTION TO ENGLISH LITERATURE. Yr; 2 cr. This course, the material in which is not taken up in historical order, is primarily a course in the appreciation of literature. It is provided especially for sophomores who are candidates for the general B.A. degree. 9, 10, or 11 TT. (First semester's work repeated in second semester and second semester's work given during first semester, 1:30 TT.) Mr. Beatty and staff.

185. INTRODUCTION TO ENGLISH LITERATURE. Yr; 2 cr. This course, the material in which is not taken up in historical order, is primarily a course in the appreciation of literature. It is provided especially for sophomores who are candidates for the general B.A. degree. 9, 10, or 11 TT. (First semester's work repeated in second semester and second semester's work given during first semester, 1:30 TT.) Mr. Beatty and staff.

ENGLISH LANGUAGE AND LITERATURE

31. CHAUCER. I; 3 cr. 10 MWF. Mr. Beatty.

32. ENGLISH BIOGRAPHY. I; 3 cr. Not offered 1932-33. Mr. Glicksman.

34. THE ROMANTIC MOVEMENT. I; 3 cr. 9 or 10 MWF. Mr. Roe, Miss White.

35. THE VICTORIAN ERA. II; 3 cr. 9 or 10 MWF. Mr. Roe, Miss White.

37. SHAKESPEAREAN DRAMA. Yr; 3 cr. Open to juniors. A broad course for undergraduates. 11 MWF. Mr. Beatty.

39. THE ENGLISH NOVEL. Yr; 2 cr. Richardson to Meredith. Offered 1931-32 and in alternate years. 9 TT. Mr. Fulcher.

40. AMERICAN LITERATURE. Yr; 2 cr. A general survey. This course should be preceded or accompanied by English 30. 9 or 10 TT. (First semester's work repeated in second semester and second semester's work given during the first semester, 9 TT.) Mr. Cairns, Mr. Clark.

48. LITERARY ASPECTS OF THE ENGLISH BIBLE. I; 3 cr. 10 MWF. Miss Wales.

54. CARLYLE AND RUSKIN. I; 3 cr. Not offered 1932-33. Mr. Roe.

55. EMERSON AND ARNOLD. II; 3 cr. Not offered 1932-33. Mr. Roe.

57. MILTON. II; 3 cr. 10 MWF. Mr. Quintana.

63. NON-DRAMATIC LITERATURE 1580-1660. I; 3 cr. Not offered 1932-33. Mr. Dodge.

67. CONTEMPORARY DRAMA. See Comparative Literature 67.

68. CONTEMPORARY NOVEL. See Comparative Literature 68.

100. SENIOR THESIS. Yr; 2 cr.

102. RENAISSANCE EPIC. See Comparative Literature 102.

103. RENAISSANCE THOUGHT. See Comparative Literature 10?

104. HARDY AND MEREDITH. II; 2 cr. 1:30 TT

108. OLD NORSE. See Scandinavian 108.

114. EMERSON. II; 2 cr. 1:30 MW. Mr. Clark.

118. PRE-SHAKESPEAREAN DRAMA. Yr; 3 cr. Not offered 1932-33. Mr. Fulcher.

120. ANGLO-SAXON. I; 3 cr. 9 MWF. Mr. Beatty.

121. MIDDLE ENGLISH. II; 3 cr. 10 MWF. Mr. Leonard.

122. BEOWULF. II; 3 cr. Not offered 1932-33. Mr. Leonard.

123. HISTORY OF THE ENGLISH LANGUAGE. I; 3 cr. S; Exercise taken in the junior year by condidates for the teachers' certificate. 3:30 MWF. Mr. Pooley.

125. CONTEMPORARIES AND IMMEDIATE SUCCESSORS OF CHAUCER. I; 3 cr. 10 MWF. Mr. Leonard.

129. SWIFT. I; 3 cr. Considerable attention is given to English thought in the seventeenth century as it bears upon Swift. 11 MWF. Mr. Quintana.

136. ELIZABETHAN DRAMA INCLUDING SHAKESPEARE. Yr; 3 cr. In this course practically all of the plays of Shakespeare are read, with representative plays by important contemporaries. 11 MWF. Mr. Pyre.

137. SHAKESPEARE. Yr; 3 cr. In this course about half the plays of Shakespeare are read, four of them being studied in minute detail. Prerequisite: Senior standing. 11 MWF. Mr. Lathrop.

138. ENGLISH PROSE STYLE. Yr; 2 cr. Offered 1932-33 and in alternate years. 10 TT. Mr. Taylor.

141. TENNYSON. I; 3 cr. Not offered 1932-33. Mr. Thomas.

142. VERSIFICATION. II; 2 cr. Offered 1932-33 and in alternate years. Mr. Pyre.

143. FAMILIAR ESSAY. I; 2 cr. Offered 1931-32 and in alternate years. 10 TT. Mr. Taylor.

144. WORDSWORTH. II; 3 cr. Not offered 1932-33. Mr. Beatty.

145. BROWNING. I; 3 cr. 9 MWF. Mr. Beatty.

147. ENGLISH ESSAYISTS. II; 2 cr. Offered 1931-32 and in alternate years. 10 TT. Mr. Taylor.

149. THE AMERICAN SHORT STORY. I; 2 cr. 1:30 MW. Mr. Cairns.

150. THE AMERICAN NOVEL. II; 2 cr. 1:30 MW. Mr. Cairns.

152. LATER VICTORIAN POETRY. I; 3 cr. Not offered 1932-33. Miss Wallerstein.

160. THE SIXTEENTH CENTURY. I; 3 cr. 10 MWF. Mr. Dodge.

161. LITERATURE 1660-1745. I, II; 3 cr. 10 MWF. Mr. Lathrop.

162. LITERATURE 1745-98. I; 3 cr. 11 TT; quiz. Miss Thornbury.

169. AMERICAN POETRY OF THE NINETEENTH CENTURY. Yr; 2 cr. 11 TT. Mr. Cairns.

173. AMERICAN LITERATURE OF THE LATER EIGHTEENTH CENTURY. I; 3 cr. 1:30 MWF. Mr. Clark.

177. RENAISSANCE SATIRE. See Comparative Literature 177.

180. READING FOR HONORS. 4 cr.

185. INTRODUCTION TO PHONETICS. II; 3 cr. 1:30 MWF. Mr. West.

200. RESEARCH IN ENGLISH. II; 2 cr. Mr. Beatty.

209. MILTON. II; 3 cr. 11 MWF. Mr. Dodge.

227. SEMINARY, HISTORY OF THE ENGLISH LANGUAGE. Yr; 2 cr. 7:30-9:30 M. Mr. Leonard.

232. INTRODUCTORY SEMINARY. Yr; 2 cr. Carlyle and Ruskin. 1:30-3-30 Th. Mr. Roe.

233. INTRODUCTORY SEMINARY. Yr; 2 cr. 1:30-3-30 F. 1931-32, Shakespeare's Use of His Sources, Miss Wales; 1932-33, Shakespearean Criticism, Mr. Pyre.

234. INTRODUCTORY SEMINARY. Yr; 2 cr. Seventeenth-Century Thought. 1:30-3:30 W. Mr. Quintana.

240. INTRODUCTORY SEMINARY. Yr; 2 cr. 1931-32, Poe and Whitman; 1932-33, Problems in Anglo-American Literary Relations, 1783-1833. 3:30-5:30 W. Mr. Cairns.

244. SEMINARY. Yr; 2 cr. 1:30-3-30 Tu. 1931-32, Classical Influences in the Sixteenth Century, Mr. Lathrop. 1932-33, Byron, Mr. Leonard.

TEACHERS' COURSE

THE TEACHING OF ENGLISH. See School of Education.

FINE ARTS

(See Art History, page 100)

FORESTRY AND FOREST PRODUCTS

ARTHUR KOEHLER, M.S., *Lecturer in Forest Products*
HARRY DONALD TIEMANN, M.E., M.F., *Lecturer in Forest Products*

These courses are given in cooperation with the United States Forest Products Laboratory, as described under that heading, to which students interested in the utilization of wood, chemistry of forest products, etc., are referred for further information. The three courses here listed may be elected by juniors and seniors in Letters and Science with the consent of the Dean.

1. GENERAL FORESTRY. I; 2 cr. A non-technical course on identification of native trees; the forest condition and the forest policy of the United States. 11 TT. Mr. Tiemann.

101. PROPERTIES OF WOOD. I; 2 cr. Physical, mechanical, and chemical properties of wood; structure of wood fibers; seasoning, gluing, finishing, and pulping characteristics; relation of defects and fungi to wood properties. Prerequisite: Forestry 1 or equivalent. Offered 1931-32 and in alternate years. 4:40 TT. Mr. Koehler, et al.

102. WOOD TECHNOLOGY. II; 2 cr. The structure and identification of commercial species of wood. 11 TT. Mr. Tiemann.

FRENCH AND ITALIAN

HUGH ALLISON SMITH, M.A., *Professor of French, Chairman*
FREDERICK DANIEL CHEYDLEUR, Ph.D., *Professor of French*
WILLIAM FREDERICK GIESE, M.A., *Professor of French, Emeritus*
EDWARD BUNKER SCHLATTER, Ph.D., *Professor of Romance Languages*
CASIMIR DOUGLASS ZDANOWICZ, Ph.D., *Professor of French* (on leave II)
CHARLES FREDERICK GILLEN, Ph.D., *Associate Professor of French*
SAMUEL GREENE ARNOLD ROGERS, M.A., *Associate Professor of French* (on leave I)
JOSEPH LOUIS RUSSO, Ph.D., *Associate Professor of Italian*
ROBERT FOSTER BRADLEY, JR., M.A., *Assistant Professor of French*
JULIAN EARLE HARRIS, Ph.D., *Assistant Professor of French*
ANDRÉ LÉVÊQUE, Ph.D., *Assistant Professor of French*
ROBERT BELL MICHELL, Ph.D., *Assistant Professor of French*

INSTRUCTORS

CHARLES T. CADDOCK, JR., M.A.
MARJORIE COVERT, M.A.
CHARLES HUNT GREENLEAF, M.A.
ALDEN RICHARDSON HEFLER, M.A.
J. PROCTOR KNOTT, M.A.
ESTHER MARHOFER, M.A.
GERMAINE MERCIER, M.A.
EDWARD ELGIN MILLIGAN, M.A.
JOSEPH ROSSI, M.A.
FRANCIS ROY, Licencié ès lettres
JOHN MICHAEL SULLIVAN, M.A.

The elementary courses in French and Italian have been planned to meet the needs of those who have begun the language in high school, as well as of those who take it up for the first time in college. One unit (year) of high-school work is assumed to be the equivalent of 4 credits, or one semester, of college work, but all entering students continuing their work in language are assigned to courses on the basis of placement tests given during Freshman Period (for transfers, at end of first week of classes). These tests may permit a student to go into a more advanced course but will not give credit toward graduation.

See also page 55 for attainment tests. Lists of suggested readings in preparation for the proficiency test may be obtained from the department office.

French 13 and 15 and Italian 15 are second-year practice courses intended to supplement the training in French and Italian 10, which emphasize the acquiring of reading knowledge. They may be taken only in conjunction with some other course in the language, except by special permission. French 16, 124, and 127, and Italian 116 afford more advanced training in writing and speaking.

French 21 is a third-year course which includes translation, study of the literary aspect of the work read, and literary history. This course, or its equivalent, is prerequisite to advanced courses in French literature. Italian 20 is similarly designed to be introductory to other courses in Italian literature, although students receiving a grade of B, or above, in fourth-semester Italian should go directly into the advanced courses in literature.

Students are advised to consult the foreign-language requirements for the B.A. degree, page 64.

MAJOR. In French, 28 credits in advance of 1b, including thesis, thesis course, or substitute. In Italian, 24 credits in advance of 1b. Lower-group students are required to take 4-6 credits in literature courses numbered above 100 in lieu of writing a thesis.

The comprehensive examination for majors in French, which will be given toward the end of each semester, will consist of two parts: (1) literature and culture, (2) language. Part one will require a general knowledge of French literature and culture from the Renaissance to the present, according to the list of readings furnished by the department. Part two will require (a) a reasonable proficiency in pronouncing, understanding, and speaking French, (b) ability to comprehend classic and modern writers, including translation into idiomatic English; (c) ability to translate simple English into French. The examination will be written, except for (a) of part two, which will be oral.

These requirements are not designed to prevent a student from concentrating either on literature or on language, nor from more intensive study of a given period, provided a minimum test be met in each field.

By faculty requirement, students choosing a foreign-language major must present a second foreign language.

All who intend to specialize in French or Italian are urged to elect related courses in history, art, other languages and literature, and philosophy. Those who expect to continue work for advanced degrees should note that knowledge of another foreign language is required for the M. A., and that for satisfactory work in Romance philology some knowledge of Latin is indispensable. Both Latin and German, as well as another Romance language, are required for the Ph.D. and should be acquired as early as possible.

TEACHING MAJOR AND MINOR. See School of Education.

FRENCH HOUSE. *La Maison Française,* intended especially for intensive training in speaking French, is maintained under the auspices of the department. It is open to women students for room and board, and both men and women rooming outside may take their meals there. Women of French birth reside in the house to aid in conversation, and they, with regular instructors, preside at the tables, where French only is spoken. Prospective teachers of French, and all others desirous of acquiring practice in the spoken language, are urged to room or board at the French House. With approval of the departmental faculty, a part of the prescribed training in conversation, necessary for the teachers' certificate, may be done in this house. Requests for further information and application for rooms and board should be directed to the Chairman, Department of French and Italian, and sent well in advance, both for summer session and regular year. The house is also headquarters for the French Club.

ITALIAN TABLE. An Italian table is conducted several times a week at *La Maison Française.* Inquiries should be addressed to Professor Russo.

CLUBS. French and Italian clubs at the University afford students opportunities to hear talks about the country whose language they are studying, to participate in short plays and games, and to converse in the language in which they are interested. Modern and classical plays are presented in public from time to time.

FRENCH

LANGUAGE

1a. First-Semester French. I, II; 4 cr. For students who have had no French. 18 sections I; 4 sections II. Mr. Bradley and staff.

1b. Second-Semester French. I, II; 4 cr. Prerequisite: French 1a or one year of high-school French. Based on an examination, or their previous record of B or above, the better students are assigned to special sections. 4 sections I; 17 sections II. Mr. Bradley and staff.

3. Reading Course for Graduate Students. I, II; 0 cr. Mr. Gillen.

10a. Third-Semester French. I, II; 3 cr. Largely a reading course. Prerequisite: French 1b or two years of high-school French. Based on an examination, or a previous record of B or above, the better students are assigned to special sections. 16 sections I; 4 sections II. Mr. Bradley and staff.

10b. Fourth-Semester French. I, II; 3 cr. Largely a reading course. Prerequisite: French 10a or three years of high-school French. Based on an examination, or a previous record of B or above, the better students are assigned to special sections. 7 sections I; 15 sections II. Mr. Bradley and staff.

13. Rapid Reading. Yr; 1 cr. Emphasis on sight translation; contemporary prose. To be taken only with French 10a or 10b; not open to students with two years of college French (except by special permission). Does not count toward French teaching major or minor. 6 sections. Mr. Bradley and staff.

15. Elementary Composition and Conversation. Yr; 2 cr. Review of grammatical principles with oral and written exercises. Supplementary course to be taken with French 10a and 10b. Not open to students who have had the equivalent of two years of college French, except by special permission. 8 sections. Mr. Bradley and staff.

16. Intermediate Composition and Conversation. Yr; 2 cr. Prerequisite: Grade of at least *C* in 10b or in 15b. 8 sections. M. Lévêque and staff.

18. France of Today. Yr; 2 cr. Reading and discussion of books, newspapers, and periodicals. Open only to students in journalism and commerce, except by special permission. Prerequisite: French 10b and sophomore standing. 8 TT. Mr. Harris.

124. Composition and Conversation. Yr; 2 cr. Prerequisite: French 16 or grade of A or B in 10b and 15b. Conducted in French. 3 sections. Mlle Dior, M. Lévêque, Mlle Mercier.

127. Advanced Composition and Conversation. Yr; 2 cr. Prerequisite: French 16 with grade of A, or French 124. Conducted in French. 10 TT. Mlle Mercier.

141. History of the French Language. Yr; 1 cr. Lectures and assigned reading. Prerequisite: French 21. 2:30 W. Mr. Schlatter.

190. PHONETICS. I, II; 2 cr. Theory of French sounds, with practice in pronunciation. Prerequisite: Three years of college French. 11 TT or 11 MW. Mr. Bottke.

191. FRENCH DICTION. II; 2 cr. Study of stress, quantity, rhythm, breathing, articulation, voice, intonation. Prerequisite: French 190 or consent of instructor. Not offered 1932-33.

227. GRADUATE COURSE IN COMPOSITION. Yr; 1 cr. Open to students who have had French 127 or equivalent. Conducted in French. Not offered in 1932-33.

240. OLD FRENCH. Yr; 2 cr. An introductory course, phonology and grammar. Lectures and reading. Mr. Harris.

244. OLD PROVENÇAL. Yr; 2 cr. Not offered 1932-33.

TEACHERS' COURSE

THE TEACHING OF FRENCH. See School of Education.

LITERATURE

Six credits in French 21, or equivalent, are prerequisite to all other courses in French literature.

21a. ELEMENTARY SURVEY (19th century). I, II; 3 cr. Prerequisite: French 10b or four years of high school French. Based on an examination or their previous record of B or above, the better students are assigned to special sections. Translation, assigned reading, study of literary aspects of works read, and literary history. 12 sections I; (two of which are conducted in French); 2 sections II. Mr. Michell and staff.

21b. ELEMENTARY SURVEY (17th and 18th centuries). I, II; 3 cr. Prerequisite: French 21a. Based on an examination or their previous record of B or above, the better students are assigned to special sections. 2 sections I; 12 sections II (two of which are conducted in French). Mr. Michell and staff.

50. FRENCH MASTERPIECES IN TRANSLATION. See Comparative Literature 50.

100. THESIS COURSE. Yr; 2 cr. Open only to seniors and graduates in groups not exceeding 10. Students must register with the chairman of the department for individual theses or thesis courses. Letters and biography—Mr. Gillen.

122. FRENCH LITERATURE OF THE NINETEENTH CENTURY. Yr; 3 cr. 10 MWF. Mr. Giese.

123. MODERN FRENCH DRAMA. Yr; 3 cr. From the Romantic period to the present. 9 or 10 MWF. Mr. Smith.

125. CONTEMPORARY FRENCH LITERATURE. Yr; 3 cr. This course should be preceded by some general course on a century or a genre. 1:30 MWF. First semester 1932-33, Mr. Bradley; second semester, Mr. Rogers.

126. Explication de Textes. I; 2 cr. Reading of texts, prose and poetry, with a careful study of the contents, author, background, etc. Conducted in French. Not offered 1932-33. M. Lévêque.

131. General Survey of French Literature. Yr; 3 cr. 8 MWF. Mr. Cheydleur.

132. French Literature of the Eighteenth Century. Yr; 2 cr. Especially Voltaire, Diderot, Rousseau. 9 TT. Mr. Michell.

133. Victor Hugo . I; 2 cr. 11 TT. Mr. Michell.

134. Balzac. I; 2 cr. Offered 1931-32 and in alternate years. Mr. Michell.

136. French Novel from the Seventeenth Century to the Twentieth. Yr; 3 cr. 11 MWF. Mr. Cheydleur.

137. Molière. Yr; 2 cr. Not offered 1932-33. Mr. Zdanowicz.

139. French Literature of the Seventeenth Century. Yr; 3 cr. Conducted in French. 8 MWF. M. Lévêque.

145. French Literature of the Sixteenth Century. Yr; 2 cr. Offered 1932-33 and in alternate years. 2:30 TT. First semester, Mr. Zdanowicz; second semester, Mr. Michell.

150. French Civilization. Yr; 1-2 cr. The background of history, art, and institutions as an aid to the understanding of the principal movements of French literature. Lectures, readings, and reports. 8 TT. Conducted in French. M. Lévêque.

157. French Lyric Poetry. Yr; 2 cr. 10 TT. Mr. Gillen.

200. Individual Research in French. Yr; *cr. Superior graduate students, with special permission, may do individual research, under supervision, in some definite field. Staff, on consultation with chairman of department.

242. Old French Epic Poetry. Yr; 2 cr. The history of the *Chanson de Geste* traced, and several representative poems read during the year. Offered 1931-32 and in alternate years. Mr. Smith.

243. Seminary, Old French Literature. Yr; 2 cr. A general survey of the Arthurian Cycle; with special emphasis on *Tristan, Marie de France,* and *Chrétien de Troyes.* Offered 1932-33 and in alternate years. Mr. Harris.

250. The Renaissance in France. Yr; 2 cr. A study of the development of the Renaissance spirit and its manifestations in France, with special study of some representative 16th-century author. Offered 1931-32 and in alternate years. Mr. Zdanowicz.

252. Seminary, Ancient French Drama. Yr; 2 cr. Not offered 1932-33. Mr. Smith.

253. Seminary, French Literature. Yr; 2 cr. The growth of Classicism and its general spirit, with special study of some representative author each semester. Offered 1932-33 and in alternate years. Mr. Giese.

254. Seminary, French Literature. Yr; 2 cr. Realism and Naturalism in the French drama. Mr. Smith.

255. SEMINARY, FRENCH LITERATURE. Yr; 2 cr. Realism and Naturalism in the novel and short story. Not offered 1932-33. Mr. Smith.

256. SEMINARY, MODERN FRENCH LITERATURE. Yr; 2 cr. Romanticism. Offered 1931-32 and in alternate years. Mr. Giese.

ITALIAN

LANGUAGE

1a. FIRST-SEMESTER ITALIAN. I, II; 4 cr. For students who have not studied Italian. 4 sections I; 2 sections II. Miss Marhofer, Mr. Milligan, Mr. Rossi.

1b. SECOND-SEMESTER ITALIAN. I, II; 4 cr. Prerequisite: Italian 1a or one year of high-school Italian. 1 section I; 4 sections II. Miss Marhofer, Mr. Rossi.

9. BEGINNING ITALIAN FOR GRADUATES. Yr; two hours per week; no credit. A very rapid course aiming at a reading knowledge. 4:30 MW. Mr. Rossi.

10a. THIRD-SEMESTER ITALIAN. I; 3 cr. Prerequisite: Italian 1b or two years of high-school Italian. 2 sections. Mr. Rossi.

10b. FOURTH-SEMESTER ITALIAN. II; 3 cr. Prerequisite: Italian 10a or three years of high-school Italian. 2 sections. Mr. Rossi.

15. ELEMENTARY COMPOSITION AND CONVERSATION. Yr; 2 cr. Supplementary course to be taken with Italian 10a and 10b. 2 sections. Mr. Rossi.

19. ITALY OF TODAY. Yr; 2 cr. Lectures alternated with a study of the elements of the Italian language for the purpose of quickly acquiring a reading knowledge of simple, journalistic Italian. Lectures on the present social, economic, cultural, and political conditions in Italy; language study based on reading of current periodicals as soon as the few essential linguistic elements have been acquired. 9 TT. Mr. Russo.

20. THIRD-YEAR READING. Yr; 3 cr. Prerequisite: Italian 10b. Not open to those whose grade in Italian 10b was B or above; such students should take literature courses. 9 MWF. Miss Marhofer.

116. ADVANCED COMPOSITION AND CONVERSATION. I; 2 cr. Prerequisite: Italian 15 with grade of B. 11 TT. Mr. Russo.

LITERATURE

Two years of Italian in college, or the equivalent, are prerequisite to advanced courses in Italian, except, by special permission of the instructor.

53. ITALIAN MASTERPIECES IN TRANSLATION. See Comparative Literature 53.

100. SENIOR THESIS. Yr; 2 cr. Mr. Russo.

102. ITALIAN LITERATURE OF THE LAST FIFTY YEARS. Yr; 3 cr. Especially Carducci, D'Annunzio, Pascoli, Fogazzaro, Verga, and Pirandello. Conducted in Italian. Not offered 1932-33. Mr. Russo.

122. RISORGIMENTO. Yr; 3 cr. A study of the authors who, from the time of the French Revolution to 1870, inspired the struggle for the rebirth of Italy. Not offered 1932-33. Mr. Russo.

123. ITALIAN DRAMA. Yr; 3 cr. The development of Italian drama from its origins to the present. Conducted in Italian. 2:30 MWF. Mr. Russo.

131. GENERAL SURVEY OF ITALIAN LITERATURE. Yr; 3 cr. Lectures, reports and reading of representative works from the thirteenth century to the present. Offered 1932-33 and in alternate years. 11 MWF. Mr. Russo.

136. ITALIAN NOVEL. Yr; 3 cr. A study of the short story and the novel from the *Novellino* to Pirandello. Not offered 1932-33. Mr. Russo.

141. ITALIAN LITERATURE OF THE SEVENTEENTH CENTURY. I; 2 cr. Spanish influence, *marinismo,* new thought; Bruno and Campanella. Conducted in Italian. Not offered 1932-33. Mr. Russo.

142. ITALIAN LITERATURE OF THE EIGHTEENTH CENTURY. II; 2 cr. Arcadia and Rinnovamento; Goldoni, Parini, and Alfieri. Conducted in Italian. Not offered 1932-33. Mr. Russo.

152. ITALIAN RENAISSANCE. Yr; 3 cr. From Petrarch to Tasso. Humanism and classicism; particular emphasis on the poems of chivalry, Machiavelli and Guicciardini. Conducted in Italian. Not offered 1932-33. Mr. Russo.

160. DANTE'S DIVINA COMMEDIA. Yr; 3 cr. Lectures on Dante's life and times, reading of the *Divine Comedy,* comment, discussions, reports. Offered 1931-32 and in alternate years. 2:30 MWF. Mr. Russo.

161. TRECENTO. Yr; 2 cr. The literature of the fourteenth century, excluding the *Divine Comedy.* 3:30 MW. Mr. Russo.

PHILOLOGY

171. INTRODUCTION TO ITALIAN PHILOLOGY. I; 2 cr. Derivation of the Italian language from medieval Latin; elementary phonology and morphology. Not offered 1932-33. Mr. Russo.

172. EARLY ITALIAN WRITERS. II; 2 cr. The Italian literature before Dante. Not offered 1932-33. Mr. Russo.

GEOGRAPHY

VERNOR CLIFFORD FINCH, Ph.D., *Professor of Geography, Chairman*
RAY HUGHES WHITBECK, B.A., *Professor of Geography*
GLENN THOMAS TREWARTHA, Ph.D., *Associate Professor of Geography*
LOYAL DURAND, JR., Ph.D., *Assistant Professor of Geography*
JOE RUSSELL WHITAKER, Ph.D., *Assistant Professor of Geography*
OLIVE JACKMAN THOMAS, M.S., *Instructor in Geography*

The introductory courses in geography are 1-2 and 5-6. For a general survey of geography either of these courses should be followed by one or more of the regional courses, 101, 102, 103, 104, 107, 110, and 111, and by one or more of the topical courses, 106, 127, 128, and 145. Course 1-2 (formerly numbered 4) is the only course in geography that satisfies the science requirement for the B.A. degree. Geography 5-6, an introductory course in general geography, is intended primarily for those expecting to enter the School of Commerce or desiring a general cultural background of world geography without laboratory training.

MAJOR. An undergraduate major in geography requires a minimum of 30 credits, including 12 credits of regional and topical courses and 4 credits of thesis. Courses 1-2 or 5-6 will normally be followed by course 140 and that by a selection of the regional and topical courses together with such special courses (126, 131, 132, and 135) as the student may elect. Geography majors are urged to elect Geology 130, Physiography of the United States, concurrently with Geography 140, or as soon as may be after completing course 2 or 6. Geology 109, 134, 143, and 150 are also recommended. Senior theses are written only by upper-group students and at the request of the department.

HISPANIC STUDIES AS A FIELD OF CONCENTRATION. Students interested in this major field should consult page 58.

1–2. ELEMENTS OF NATURAL ENVIRONMENT. Yr; 5 cr. A general survey of the characteristics of the major types of land surfaces, climates, soils, and resources that comprise the natural environment of man. Open to freshmen. Students who have taken Geology 1 may receive but three credits for the work in Geography 1 because of certain duplications in subject matter. Lab. fee $1.50. Lecture 11 TT; 6 hrs. lab. and field work; 2 hrs. quiz. Mr. Finch, Mr. Durand, and staff.

3. ECONOMIC GEOGRAPHY. I; 3 cr. 11 MWF. Mr. Whitbeck.

5–6. REGIONAL ECONOMIC GEOGRAPHY. Yr; 3 cr. A brief survey of the elements of natural environment; economic geography of the United States; study of the continents. Open to freshmen. Sections at 9 and 2:30 MWF. Mr. Trewartha and staff.

100. SENIOR THESIS. Yr; 2 cr. Staff.

101. GEOGRAPHY OF NORTHERN EUROPE. II; 3 cr. Prerequisite: Sophomore standing. 11 MWF. Mr. Durand.

102. GEOGRAPHY OF SOUTH AMERICA. II; 3 cr. Prerequisite: Sophomore standing. 9 MWF. Mr. Whitbeck.

103. GEOGRAPHY OF NORTH AMERICA. II; 3 cr. Prerequisite: Sophomore standing. 10 MWF. Mr. Finch.

104. Geography of Wisconsin. I; 2 cr. Prerequisite: Sophomore standing. 1:30 TT. Mr. Durand.

106. Agricultural Geography. I; 3 cr. Prerequisite: Geography 1 or 5, or consent of instructor. 10 MWF. Mr. Finch.

107. Geography of the Mediterranean Region. I; 3 cr. Prerequisite: Sophomore standing. 9 MWF. Mr. Whitaker.

110. Geography of Asia. I; 3 cr. Prerequisites: Sophomore standing. 11 MWF. Mr. Trewartha.

111. Geography of Middle America. I; 2 cr. Includes Mexico, Central America, and the West Indies. Prerequisite: Sophomore standing. 9 TT. Mr. Whitbeck.

126. Cartography and Graphics. I; 2 cr. Prerequisite: Sophomore standing. 1:30-3:30 TT. Mr. Finch.

127. Industrial Geography. II; 3 cr. Prerequisite: Sophomore standing. 10 MWF. Mr. Whitbeck.

128. Conservation of Natural Resources. II; 3 cr. Prerequisite: Sophomore standing. 9 MWF. Mr. Whitaker.

131. Summer Field Course in Physiography and Geography. 3 to 6 cr. During or following the summer session. Enrollment only by previous arrangement with the instructor. Mr. Durand.

132. Seminary in Geography. Yr; 2 cr. Prerequisite: Senior standing. 3:30-5:30 Tu. Mr. Whitbeck, Mr. Finch, Mr. Trewartha.

135. Field Practice in Economic Geography. II; 3 cr. Geography major or consent of instructor. 3:30-5:30 Th. and six Saturdays in field. Mr. Trewartha, Mr. Finch.

140. Climatography. Yr; 2 cr. Prerequisite: Geography 2 or 5. 11 TT. Mr. Trewartha.

142. Current Literature of Geography. II; 1 cr. Mr. Whitbeck.

145. The Geography of Foreign Markets. II; 2 cr. Primarily a lecture course. Lectures by the members of the geography staff on geographic aspects of ocean transportation and the markets and trade of the commercial regions of the world. Certain readings are required. Prerequisite: Sophomore standing. Not offered 1932-33. Mr. Finch and staff.

180. Special Work in Geography. Yr; 1-3 cr. Staff.

TEACHERS' COURSE

The Teaching of Geography See School of Education.

GEOLOGY

CHARLES KENNETH LEITH, Ph.D., *Professor of Geology, Chairman*
WARREN JUDSON MEAD, Ph.D., *Professor of Geology*
WILLIAM HENRY TWENHOFEL, Ph.D., *Professor of Geology*
ALEXANDER NEWTON WINCHELL, M.S., Sc. D., *Professor of Geology*
RICHARD CONRAD EMMONS, Ph. D., *Associate Professor of Geology*
ROBERT RAKES SHROCK, Ph.D., *Assistant Professor of Geology*
FREDRICK TURVILLE THWAITES, M.A., *Lecturer in Geology*
RICHARD JACOB LUND, Ph.D., *Instructor in Geology*

MAJOR. A minimum of 30 credits, including thesis, is required. For students wishing a survey of the field for general educational purposes, courses 1, 6, 7, 8, and 17 are suggested. Course 1, General geology, is the principal introductory course. Short courses in geology and mineralogy (7, 8, and 17) are offered without prerequisites, except for elementary knowledge of chemistry, to students not intending to take further work in these subjects. Students who take these short courses will be allowed to enter advanced courses only by special arrangement. Field work is given in connection with Geology 1, 11, 17, 112, 114, 125, 130, 133, and 143.

GENERAL GEOLOGY

1. GENERAL GEOLOGY. Yr; 5 cr. Students who have taken Geography 1 may receive but 3 credits for the work of the first semester in order to offset certain duplications of subject matter. The first semester is a study of the materials and structure of the earth, the surface of the earth, and the processes which modify materials, structure, and surface. Second semester, a study of earth history through geologic time, and elementary paleontology. Lab. fee $1.50 each semester. Lecture 10 MTWF; 4 hrs. lab. Mr. Twenhofel and staff.

9. ENGINEERING GEOLOGY. Yr; 3 cr. A course in elementary geology for students in engineering. First semester required of juniors in civil engineering; both semesters required of students in mining engineering. Lab. fee $1.50 per semester. Lecture 9 MWF; lab. Mr. Mead, Mr. Lund.

11. MAPPING. II; 3 cr. Not open to freshmen. Application of plane table and other instruments to geologic and topographic mapping. Lab. fee $3.00. Mr. Thwaites.

17. SURVEY OF GEOLOGY: THE EARTH'S STORY. II; 3 cr. A brief course designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Open to all students, excepting those who have taken Geology 1. or 9 or Geography 1. Lecture 9 MWF; field trips with supplementary laboratory work. Lab. fee $1.00. Mr. Shrock.

100. SENIOR THESIS. Yr; 2 cr.

125. FIELD WORK FOR ADVANCED STUDENTS. II; 1 cr. One week in May in alternate years is spent in geologic mapping of some selected area, usually in the iron or copper districts of Lake Superior or the zinc district of Wisconsin. Offered 1931-32 and in alternate years. In the semester following course 117, a ten-day trip is taken to the Lake Superior district, offering a survey of the region. Mr. Leith, Mr. Mead.

134. Regional Geology. Yr; 2 cr. Prerequisites: Geology 1 or 9, 114, and senior standing. A study of world geology. Western hemisphere first semester, eastern hemisphere second semester. Offered 1931-32 and in alternate years. 8 TT. Mr. Twenhofel.

135. History of Geology. I; 1 cr. Prerequisites: Geology 1 or 9 or Geography 1; senior standing. Offered 1933-34 and in alternate years. 1:30 W. Mr. Twenhofel.

143. Glacial Geology. II; 3 cr. Prerequisite: Geology 1 or 9, or Geography 1. 3:30 MWF. Mr. Thwaites.

156. Applied Engineering Geology. II; 2 cr. Prerequisite: Geology 1a or 9a. 11 TT. Mr. Mead.

200. Research. Yr; *cr. Staff.

PALEONTOLOGY

22. Elementary Paleontology. II; 2 cr. A study of extinct organisms. To be preceded by or taken with Geology 1 or 9 unless student has taken Zoology 1. Mr. Shrock.

112. Historical Geology and Stratigraphy. II; 5 cr. Prerequisites: Geology 1 and 121. Offered 1932-33 and in alternate years. 8 TT; 8-10 MWF. Mr. Twenhofel.

121. Paleontology. I; 5 cr. Prerequisite: Geology 22. Lab. fee $1.00. Mr. Shrock.

PHYSICAL GEOLOGY

52. Elementary Economic Geology. I; 3 cr. Prerequisites: Geology 1, 2, or 9, and 6 or 7. A study of the manner of occurrence, origin and uses of the metallic ores and the non-metallic mineral products. 10 MWF; 2 hrs. lab. Mr. Lund.

114. Structural Geology. I; lect. 3 cr.; lab. 2 cr. The laboratory work includes map interpretation. Prerequisite: Geology 1. Lab. fee $3.00. Lect. 11 MWF; lab. 1:30-3:30 TT. Mr. Leith, Mr. Mead.

115. Metamorphic Geology. II; 5 cr. Prerequisites: Geology 1 and 6. Offered 1932-33 and in alternate years. Lab. fee $3.00. Lect. 11 MWF; lab. 1:30-3:30 TT. Mr. Mead, Mr. Emmons.

117. Principles of Pre-Cambrian Geology. I; 2 cr. Prerequisite: Geology 114. Offered 1932-33 and in alternate years. For field trips see course 125. 11 TT. Mr. Leith.

123. Oil Geology. II; 2 cr. Prerequisites: Geology 1 or 9, 114, and senior standing. Offered 1931-32 and in alternate years. Mr. Twenhofel.

133. Sedimentation. I; 5 cr. Prerequisites: Geology 1 or 9, 6, 114, and senior standing. Lect. 8 MWF; lab. Lab. fee $3.00. Mr. Twenhofel.

148. Seminary in Tectonic Geology. II; 1 cr. A review of current theories dealing with the causes and mechanics of major earth deformations. Offered 1931-32 and in alternate years. Mr. Mead.

149. METHODS OF MINERAL EXPLORATION. II; 2 cr. Deals with the geological and physical field methods employed in the search for and development of mineral deposits. Offered 1932-33 and in alternate years. 10 TT. Mr. Mead.

150. ECONOMIC ASPECTS OF GEOLOGY. I; 2 cr. A general survey of the field of mineral resources from the standpoint of geographic and commercial distribution, valuation, taxation, conservation, and international relations. The international phase of the discussion will cover questions of foreign exploitation, the "open door," tariffs, and relations to war. This course is introductory to Geology 151. Offered 1931-32 and in alternate years. 11 TT. Mr. Leith, Mr. Mead.

151. GEOLOGY OF MINERAL DEPOSITS. II; 5 cr. Prerequisites: Chemistry 1, Geology 6 or 7, and Geology 1, 2, or 9, and 52. Metallic and non-metallic mineral deposits are studied from the standpoint of mineralogy, field occurrence, and genesis. The principal mineral deposits are taken up topically. It is desirable, but not essential, that this course be preceded by course 150. Lab. fee $3.00. Lect. 11 MWF; lab. 1:30-3:30 TT. Offered 1931-32 and in alternate years. Mr. Mead.

233. STUDIES OF SEDIMENTS. II; 2 cr. Prerequisites: Geology 133. Lab. fee $5.00. Mr. Shrock.

MINERALOGY AND PETROLOGY

6. GENERAL MINERALOGY. Yr; 5 cr. Prerequisite: Chemistry 1 or a high-school course in chemistry. Lab. fee $10.00 per semester. I; Lect. 8 MWF; lab. 8-10 TT. II; Lect. 8 TT; lab. 8-10 MWF. Mr. Winchell, Mr. Emmons.

7. SHORT COURSE IN MINERALOGY. I; 2 cr. Prerequisite: Chemistry 1 or high-school course in chemistry. Lab. fee $10.00. 10-12 TT. Mr. Emmons.

8. SHORT COURSE IN LITHOLOGY. II; 2 cr. The megascopic study of igneous and sedimentary rocks. Prerequisite: Chemistry 1 or a high-school course in chemistry. 3:30-5:30 MW. Mr. Emmons.

106. GEMS AND PRECIOUS STONES. II; 1 cr. Prerequisite: Consent of instructor. Offered 1931-32 and in alternate years. 2:30 W. Mr. Emmons.

108. PETROLOGY. Yr; 5 cr. Prerequisite: Geology 6 or 7. Lab. fee $10.00 per semester. 9-11 MTWTF. Mr. Winchell.

119. PETROLOGY OF LAKE SUPERIOR ROCKS. Yr; 1-3 cr. Prerequisite: Geology 108. Offered 1932-33 and in alternate years. Lab. fee $6.00 per semester. Mr. Winchell.

120. ADVANCED MINERALOGY. Yr; 2-4 cr. The relations between composition and optical properties in isomorphous groups. Prerequisite: Geology 6. Mr. Winchell.

129. PETROGENY. Yr; 2 or 3 cr. Prerequisite: Geology 108. Lab. fee $1.00 per semester. Mr. Winchell.

138. IMMERSION METHODS. I; 3 cr. Prerequisite: consent of instructor. The identification of crystalline materials by means of the polarizing microscope and immersion methods. Lab. fee $10.00. Mr. Emmons.

141. MINERAGRAPHY. II; 2 cr. Prerequisite: Geology 6. Lab. fee $6.00. Mr. Emmons.

PHYSIOGRAPHY

109. Advanced Physiography. I; 3 cr. Prerequisite: Geology 130 or consent of instructor. Offered 1932-33 and in alternate years. 3:30 MWF. Mr. Thwaites.

130. Physiography of the United States. Yr; 3 or 5 cr. Prerequisite: Geology 1, 2, or 9, or Geography 1. Lab. fee $1.00 per semester for 5 cr. only. 1:30 MWF; lab. Mr. Thwaites.

230. Advanced Physiography of the United States. I; 3 cr. Prerequisites: Geology 130, 134, or 114. Offered 1931-32 and in alternate years. Mr. Thwaites.

GERMAN

Bayard Quincy Morgan, Ph.D., *Professor of German, Chairman*
Friedrich Bruns, Ph.D., *Professor of German*
Max Griebsch, Ph.D., *Professor of German*
Alexander Rudolph Hohlfeld, Ph.D., *Professor of German* (on leave I)
Alfred Senn, Ph.D., *Professor of Germanic and Indo-European Philology*
Ernest Karl J. H. Voss, Ph.D., *Professor of Germanic Philology, Emeritus*
Adolphine Bianca Ernst, Ph.D., *Associate Professor of German*
Ewald Paul Appelt, Ph.D., *Assistant Professor of German*
Paula Margaretha Kittel, Ph.D., *Assistant Professor of German*
W. Freeman Twaddell, Ph.D., *Assistant Professor of German*

INSTRUCTORS

Heinz Bluhm, M.A.
Esther C. Feddersen, M.A.
Stella M. Hinz, Ph.D.
Bertha Mueller, M.A.
Herman Ramras, M.A.

For Attainment Tests see section 11, page 55.

The Elementary Courses represent the work normally done in the first and second years, and are graded to meet the needs of high-school graduates with different degrees of preparation. One year of high-school work is considered as equivalent to one semester (4 credits) of college work; but freshmen, as well as students transferring from other colleges, are assigned to the various courses and given credit for the work done elsewhere on the basis of placement and attainment examinations. Students who show superior ability in their elementary work are given permission to complete courses 1a to 2b in three or possibly even two semesters, and to enter more advanced courses that much sooner. Moreover, there are special sections for beginners in which practically as much work is done in one year as the regular classes do in two years. They are open to students who have had four years of Latin in high school or similar training in other languages. On the other hand, students in elementary courses who are experiencing difficulty, especially in grammar and pronunciation, are given an opportunity to receive special group aid once a week.

The ADVANCED PRACTICE COURSES are intended for specific practical ends, definitely stated in each case. None of these courses is required of students wishing to study German for purely literary purposes.

The LITERARY COURSES are of very different degrees of advancement. The less advanced courses are divided into two groups designated A and B. Ordinarily students may not enter group B unless they have taken at least one course in group A, or its equivalent. About eight credits in these two groups combined are prerequisite for the higher courses (beyond 100) in literature or philology. Students intending to specialize in German literature are advised to do related work in English literature, in medieval and modern history, especially German history, in the history of art, and in philosophy. They should also pursue, to a fair degree of advancement, the study of at least one other foreign language and literature, ancient or modern. Their attention is also called to the courses mentioned under Comparative Literature.

The PHILOLOGY COURSES are primarily intended for graduate students working for a higher degree, but some of them are well suited to the needs of advanced undergraduates. This is especially true of courses 150, 151, and 191, which are so conducted as to be of direct benefit to properly qualified seniors, especially those preparing to teach.

MAJOR: 32 credits or equivalent, including at least 8 credits beyond course 100. Students who are requested to write a thesis need take only 4 credits beyond course 100. All students offering a foreign-language major are required to pass the "intermediate knowledge" test in a second language. Those intending to work for the degree of M.A. with a major in German should note that they too will be required to prove such knowledge.

For the requirements for a teaching major and minor, see School of Education.

DER DEUTSCHE VEREIN. All students and instructors who are interested in the German language and literature and in German life and culture are eligible to membership in the German Club, which meets in general twice a month while the University is in session. The programs comprise lectures, recitations, singing, dramatic and musical performances, and social entertainments. A special "mixed chorus" meets for song practice once a week.

DAS DEUTSCHE HAUS. The German House, which is intended primarily for the benefit of students who wish to maintain or improve their speaking knowledge of German, is open to women students for room and board, and to both men and women residing outside the house for meals. The house is in charge of a regular member of the German Department, and German is spoken at meals and is the official language of the house. Members of the teaching staff live and board at the house and preside at the tables. Especially those students who intend to teach German are urged to room or board at the house, but all others who desire practice in hearing and speaking German are eligible to full membership and are welcome as table boarders. A few undergraduate German House scholarships are available for students majoring in German who could otherwise not afford to live or board at the House. For further information, apply to German House, 508 North Frances Street, Madison.

ELEMENTARY COURSES

ASSISTANT PROFESSOR APPELT IN CHARGE

1a. FIRST-SEMESTER GERMAN. I, II; 4 cr. For students who have had no German. Pronunciation, grammar foundation, oral and written exercises. 22 sections I; 5 sections II.

1b. SECOND-SEMESTER GERMAN. I, II; 4 cr. Continuation of the practice work of the first semester, systematic work in translation, extensive reading begun. Prerequisite: German 1a, or one year of high-school German. 4 sections I; 10 sections II. (Special sections of 1a and 1b for students with four years of high-school Latin or similar training in another language.)

2a. THIRD-SEMESTER GERMAN. I, II; 3 cr. Chief emphasis on reading. Grammar review, oral practice, and written work. To be taken in connection with 4 or 5. Prerequisite: German 1b, or two years of high-school German. 12 sections I; 3 sections II.

2b. FOURTH-SEMESTER GERMAN. I, II; 3 cr. Continuation of the work of 2a. The reading in class includes one Schiller drama. To be taken in connection with 4 or 5. Prerequisite: German 2a, or equivalent. 4 sections I; 10 sections II.

4. RAPID READING. Yr; 1 cr. Modern prose, narrative and descriptive. Practice in reading at sight. Open only in connection with 2a or 2b. Required of those who are aiming chiefly at a reading knowledge. 8 sections.

5. ELEMENTARY COMPOSITION AND CONVERSATION. Yr; 2 cr. Review of grammar, with oral and written work. Expected of those who plan to do advanced work in the language. Open only in connection with 2a or 2b. 2 sections.

9. BEGINNING GERMAN FOR GRADUATES. Yr; two hours per week; no credit. Leads up to German 16. Not offered 1932-33.

ADVANCED PRACTICE COURSES

10. INTERMEDIATE COMPOSITION AND CONVERSATION. Yr; 2 cr. Prerequisite: Four credits in advance of German 2b, or a grade of B or better in German 2b. Required of all teaching majors and minors, unless 112 is substituted. Written exercises and grammar review, with discussion in German. 2 sections. 8 TT. Mr. Bluhm.

14. GERMANY OF TODAY. Yr; 2 cr. Reading and discussion of books, newspapers, and periodicals. Primarily for students in journalism and commerce. Prerequisite: German 2b or equivalent. 11 TT. Mr. Appelt

16. PROSE READING FOR GRADUATES. Yr; two hours per week; no credit. For students preparing to secure the certificate of reading knowledge. Prerequisite: Two years of college German or equivalent. Not offered 1932-33.

19. SCIENTIFIC GERMAN. Yr; 2 cr. Translation course for students specializing in science. Especially desirable for students of medicine and chemistry. Prerequisite: German 2b or equivalent. 8 or 9 MW. Miss Ernst.

41. INTERMEDIATE CONVERSATION. Yr; 1 cr. Prerequisite: Four credits in advance of German 2b, or sufficient ability in speaking German. Open only in connection with some other course in German. Not offered 1932-33.

80. SUPERVISED INDIVIDUAL READING. Yr; 2 or 3 cr. For upper-group students who have passed the "intermediate" test and desire further practice in reading, not in German literature, but in subject matter related to their major field of study, e.g. history, philosophy, other literatures, economics, or the sciences. Texts of general and not too technical character are to be agreed upon in consultation with the student's major professor. Each individual arrangement requires the approval of the Dean and of the chairman of the German Department.

100. SENIOR THESIS. Yr; 2 cr. Students must register with the chairman of the department either in the second semester of their junior year or at the beginning of their senior year. The executive committee will decide whether a student is to be requested to write a thesis or assigned to a substitute course in the 100 group of courses.

112. ADVANCED COMPOSITION AND CONVERSATION. Yr; 2 cr. For students who have a good command of German grammar and fair conversational ability and who wish to achieve fluency and ease in the writing and speaking of German. Strongly recommended to teaching candidates working for an M.A. degree. 2:30 TT. Mr. Griebsch.

SUPPLEMENTARY COURSES

Courses 75 and 141 do not count toward the minimum of 32 credits required for a German major; course 111 carries language credit if the reading is done in German.

75. GERMAN CLASSICS IN ENGLISH TRANSLATION. See Comparative Literature 75.

110. KULTURKUNDE. I; 3 cr. A study of characteristic periods and movements of the cultural development of Germany, with lectures in German on the general history of German civilization. Considerable outside reading. Especially recommended to prospective teachers of German. 11 MWF. Mr. Appelt.

111. GERMANY AND HER INSTITUTIONS. II; 2 cr. Lectures; collateral reading Especially recommended to those preparing to teach German. The geography, political organization, educational system, and cultural institutions of modern Germany and their historical background. 9 TT. Mr. Griebsch.

141. PRINCIPLES AND PRACTICE OF TRANSLATION. See Comparative Literature 141.

GERMAN LITERATURE—GROUP A

The courses in group A are intended primarily for students who have had German 2b or its equivalent. Students having more than four credits in advance of German 2b will be required to do additional work to receive full credit, and not more than six credits may be elected from this group. Courses 17 and 18 (or 19) would be the normal courses for students preparing for the "intermediate knowledge" examinations in German.

To make suitable three-, four- or five-hour combinations, the courses in this group may be taken with 10 or 41.

German is used to some extent as the language of the classroom in these courses.

3. Fifth-Semester German. II; 4 cr. Prerequisite; German 2b, or four years of high-school German. Reading, composition, oral practice. Especially for students finishing 2b in the first semester. 8 MWFS. Miss Hinz.

11. Modern German Lyric. Yr; 2 cr. A reading course in German poetry of the 19th and 20th centuries. Mr. Appelt.

15. Classical and Modern Writers. Yr; 3 cr. Prerequisite: Same as course 3. Reading, composition, oral practice. The regular third-year course for students working for "proficiency" or intending to do advanced work in German. Not open to students who have had German 3. 8 MWF, Miss Hinz; 9 TTS, Miss Schneck.

17. Modern German Drama. Yr; 2 cr. A rapid reading course in 19th and 20th century drama.

18. Modern German Novel. Yr; 2 cr. A rapid reading course in 19th and 20th-century fiction. Not offered 1932-33.

GERMAN LITERATURE—GROUP B

These courses are open to students who have had at least four credits in advance of German 2b. The chief emphasis is laid upon the reading and interpretation of literature. Not more than 6 credits (apart from course 31) may be taken in this group for full credit. German is used as the language of the classroom even more than in group A.

20. Schiller. Yr; 2 cr. An intensive reading course. First semester, *Die Braut von Messina,* life of Schiller. Second semester, *Wallenstein.* Outside reading.

22. Hebbel; Hauptmann. Yr; 2 cr. The principal dramas; study of Hebbel's tragic theory. Not offered 1932-33. Mr. Bruns.

24. Lessing. Yr; 2 cr. First semester, *Minna von Barnhelm, Emilia Galotti,* early dramas, life of Lessing; second semester, *Nathan der Weise, Erziehung des Menschengeschlechts.* Mr. Voss.

25. Goethe. Yr; 3 cr. First semester, *Laune des Verliebten, Götz,* Life of Goeth; second semester, *Egmont, Tasso.* Outside reading. Not offered 1932-33. Mr. Voss.

27. GERMAN DRAMA. Yr; 2 cr First semester, Grillparzer, Kleist; second semester, Naturalistic and modern drama. Mr. Bruns.

31. THE EIGHTEENTH AND NINETEENTH CENTURIES. Yr; 3 cr. Extensive reading in the most important authors, together with a study of the literary, historical, and cultural movements of these two centuries. Satisfactory work in this course should enable a student to pass the "proficiency" test in German. Students should have had course 15 and at least one semester of course 10 before entering. Only A and B students should attempt it with less. Not intended for students required or otherwise planning to take course 131. 10 MWF. Mr. Morgan.

GERMAN LITERATURE—ADVANCED COURSES

130. GOETHE'S FAUST. Yr; 2 cr. Interpretation of both parts of *Faust* in connection with a general study of Goethe's life and works. Mr. Hohlfeld.

131. SURVEY OF GERMAN LITERATURE. Yr; 2 or 3 cr. Lectures in German, with outside reading of representative works from the eighth century to the present. Emphasis on the relation of literature to other fields of German culture and to the literatures of England and France. Required for the teaching major and for M.A. 9 MWF. Mr. Morgan, Mr. Hohlfeld.

134. LYRIC POETRY OF THE NINETEENTH CENTURY. Yr; 2 cr. The development of German lyric poetry since 1750, with special emphasis on parallel movements in art and philosophy. Lectures in German, assigned reading, and semester topics. Not offered 1932-33. Mr. Bruns.

149. THE ROMANTIC MOVEMENT IN GERMANY. Yr; 2 cr. The precursors, the Romantic School proper, and the later romanticists. Lectures in German, assigned reading, and semester topics. Not offered 1932-33. Mr. Bruns.

180. SPECIAL READING. Advanced study in a given literary field under the guidance of a member of the department. Credit and conference hours to be arranged. Candidates should consult the chairman of the department.

200. INDIVIDUAL RESEARCH. Investigations not related to any particular course or seminary, carried on in consultation with a member of the department. Credit and conference hours to be arranged. Candidates should consult the chairman of the department.

246. BIBLIOGRAPHY AND METHODS. Yr; once a week; no cr. Required of all members of the proseminary or seminary in literature. 1:30 W. Mr. Hohlfeld.

247. PROSEMINARY IN GERMAN LITERATURE. Yr; 2 cr. Investigations of limited compass to prepare graduate students for the more advanced work of the seminary proper. In 1932-33 the field of study will be the pre-classical writers of the 18th century: I, Klopstock, Wieland; II, Lessing, Herder. 3:30 MW. Mr. Morgan.

248. SEMINARY IN GERMAN LITERATURE. Yr; 2 cr. The general fields from which problems are normally chosen for investigation are Goethe and the German drama of the 19th century. 4-6 Th. Mr. Hohlfeld.

GERMANIC PHILOLOGY

Courses 154, 191, and 269 are given in English; 153, 155, and 158, partly in German and partly in English; and the others in German.

150. History of the German Language. II; 2 cr. Reading of selected texts to illustrate the historical development of the language. 11 TT. Mr. Senn.

151. Elementary Middle High German. I; 2 cr. Lectures on the German folk epics and on German life in the twelfth century. Study of the *Nibelungenlied*. 11 TT. Mr. Senn.

152. Advanced Middle High German. I; 2 cr. Studies in the language and literature of the twelfth and thirteenth centuries. Lectures and critical study of texts. 10 MW. Mr. Voss.

153. Early Modern High German. I; 2 cr. Mr. Voss.

154. Gothic. I; 2 cr. Grammar and readings from the gospels. Not offered 1932-33. Mr. Senn.

155. Old High German. II; 2 cr. Grammar and readings from Braune's *Althochdeutsches Lesebuch*. Not offered 1932-33.

158. Old Saxon. I; 2 cr. Grammar and readings, chiefly from *Heliand*. Not offered 1932-33.

161. Historical Grammar of the German Language. Yr; 2 cr. First semester: phonology and morphology; second semester, syntax. Mr. Senn.

164. Modern and Middle Low German. II; 2 cr. *Sachsenspiegel* and *Reinke de Vos*. Mr. Voss.

191. Phonetics. II; 2 cr. With special reference to the teaching of German. 2:30 MW. Mr. Twaddell.

264. Modern Low German. I; 2 cr. Fritz Reuter's prose writings. Mr. Voss.

269. Philological Proseminary. I; 2 cr. Old High German phonology. Mr. Twaddell. II; 2 cr. Middle High German. Mr. Senn.

270. Philological Seminary. Yr; 2 cr. The work varies from year to year. For 1932-33 the topic will be: Studies in the grammar of the Germanic languages. 4:20-6 Tu. Mr. Senn.

The special attention of students in German philology is called to the courses in Anglo-Saxon, Old Norse, and general phonetics (offered by the department of English), and to the various courses listed under Comparative Philology.

GREEK

(See Classics, page 111.)

HISTORY

CARL RUSSELL FISH, Ph.D., *Professor of History, Chairman*
JOHN DONALD HICKS, Ph.D., *Professor of History*
CHESTER PENN HIGBY, Ph.D., *Professor of History*
PAUL KNAPLUND, Ph.D., *Professor of History*
HERMANN RANKE, Ph.D., *Carl Schurz Professor of History* (Professor of Egyptology at Heidelberg University)
GEORGE CLARKE SELLERY, Ph.D., LL.D., *Professor of History*
ALEXANDER ALEXANDER VASILIEV, Ph.D., *Professor of History*
CURTIS PUTNAM NETTELS, Ph.D., *Associate Professor of History*
CHESTER VERNE EASUM, Ph.D., *Assistant Professor of History*
DELOS SACKET OTIS, Ph.D., *Assistant Professor of History*
ROBERT LEONARD REYNOLDS, Ph.D., *Assistant Professor of History*
HAROLD HUNTER SCHAFF, Ph.D., *Assistant Professor of History*

When history is offered as one of the required studies in the general course leading to the degree of Bachelor of Arts (see page 64), the requirement must be satisfied by a continuous three-credit course extending through two semesters.

The courses in history are divided into three groups: (a) Courses numbered under 100 carry only undergraduate credit. The introductory courses 1, 2, 5, and 29 (see details below) are the courses open to freshmen. (b) Courses numbered in the 100 series continue in the direction of greater specialization the work begun in the introductory courses; they may be elected by students who have the necessary preparation. (c) Courses numbered above 200 are open only to graduate students.

MAJOR. FIELDS OF CONCENTRATION:—

(a) European History.
(b) American History.
(c) Hispanic Studies (See page 58).
(d) History of Culture (consult the announcement of the Department of Sociology and Anthropology).

Students with a major in Social Sciences electing to work in history will select one of these fields of concentration, and offer not less than 32 nor more than 40 credits in history, including History 2, one other introductory course (History 1, 5, 10, or 29), History 4 (6 credits), and at least 16 credits in advanced history courses taken in the University of Wisconsin and confined to European history or American history. Of the 16 credits in advanced courses, 2 in each semester of the senior year may, in the judgment of the adviser, be assigned to the preparation of a thesis in the field of concentration. In addition to the courses in history, the major requires Economics 1a and Political Science 1 or 7. Sociology 110 (Pre-history) and Geography 1-2 are strongly recommended.

TEACHING MAJOR AND MINOR. See School of Education.

INTRODUCTORY COURSES OPEN TO FRESHMEN

Students may take only one of courses 1, 2, or 5 for three credits a semester, since each contains introductory training for which credit will not be given twice; that is, if they have had or are taking one of these courses for full credit, another may be taken from this group for two credits a semester only, omitting the supplementary reading and a topical report. Students not registered in the College of Letters and Science may take any of these three introductory courses for two credits each semester.

1. MEDIEVAL HISTORY. Yr; 3 or 2 cr. Course in Humanities students who elect this course must take it for 4 credits. 10 MW; quiz. Mr. Reynolds and staff.

2. MODERN EUROPEAN HISTORY. Yr; 3 or 2 cr. 8 TT; quiz. Mr. Higby and staff.

5a-b. ENGLISH HISTORY. Yr; 3 or 2 cr. 10 TT, or 1:30 MW; quiz. Mr. Knaplund, Mr. Easum, and staff.

5b-a. ENGLISH HISTORY. Yr; 3 or 2 cr. This course commences in the second semester but is otherwise identical with History 5a-b. 8 MW; quiz. Mr. Schaff.

29. ENGLISH HISTORY, ENGLISH LITERATURE. Yr; 5 cr. The historical part of this course will present an analysis of the successive social experiences of the English people; against this background the development of English literature is considered, the emphasis falling upon the great literary movements and their outstanding representatives. Satisfies the B.A. requirements of six credits in history and four credits in English literature, and is accepted as a prerequisite for advanced courses in English. Open to freshmen exempt from English 1 and to sophomores. 9 M—F. Mr. Quintana, Miss Kellogg.

INTRODUCTORY COURSES NOT OPEN TO FRESHMEN

4a-b. HISTORY OF THE UNITED STATES. Yr; 3 cr. Seniors may elect for two or three credits. Prerequisite: Sophomore standing. 11 MWF. Mr. Fish and staff.

4b-a. HISTORY OF THE UNITED STATES. Yr; 3 cr. Seniors may elect for two or three credits. This course commences in the second semester but is otherwise identical with History 4a-b. Prerequisite: Sophomore standing. 2:30 MWF. Mr. Otis.

10. ANCIENT HISTORY. Yr; 3 or 2 cr. Prerequisite: Sophomore standing. 9 TT; quiz. Mr. Vasiliev.

TRAINING COURSES AND SPECIAL WORK

100. SENIOR THESIS. Yr; 2 cr.

180. SPECIAL WORK. Upper-class history major students of known capacity, may, by agreement with the major professor, arrange for special out-of-class work, for which credit may be allowed on the basis of one credit for each week, or its equivalent, devoted exclusively to the special project.

200. GRADUATE THESIS. Yr; * cr. Staff.

252. HISTORICAL METHOD. Yr; 1 cr. Introductory course. Graduate students in their first year are expected to take this course. 3:30 W. Mr. Nettels and others.

280. SPECIAL WORK. During the recesses of the University, and in regular terms, by agreement with the major professor, properly qualified graduate students may undertake special out-of-class work, generally upon research problems, for which credit may be allowed on the basis of one credit for each week, or its equivalent, devoted exclusively to the special project.

THE TEACHING OF HISTORY AND THE SOCIAL STUDIES. See Educational Methods 84, School of Education.

ADVANCED COURSE IN THE TEACHING AND SUPERVISION OF HISTORY AND THE SOCIAL STUDIES. See Educational Methods 185, School of Education.

ANCIENT AND MEDIEVAL HISTORY

126. LIFE AND WORK IN ANCIENT ROME. II; 2 cr. Prerequisite: Junior standing or consent of instructor. 10 TT. Mr. Vasiliev.

127. HELLENISTIC CIVILIZATION. I; 2 cr. Prerequisite: Junior standing or consent of instructor. 10 TT. Mr. Vasiliev.

129. THE FALL OF BYZANTIUM. II; 2 cr. Prerequisite: Junior standing or consent of instructor. Not offered 1932-33. Mr. Vasiliev.

131. MEDIEVAL CIVILIZATION. II; 3 cr. Prerequisites: History 1 or 5, and junior standing. Offered 1932-33 and in alternate years. 10 TT; conference. Mr. Sellery.

133. ECONOMIC LIFE IN EUROPE, 600-1750. Yr; 3 cr. Agriculture, industry, and commerce in the Middle Ages. Prerequisite: History 1, 5, or 10. Not offered 1932-33. Mr. Reynolds.

134. THE RENAISSANCE. I; 3 cr. Prerequisites: History 1, 2, or 5, and junior standing. Not offered 1932-33. Mr. Sellery.

135. HISTORY OF THE LATER ROMAN EMPIRE. Yr; 2 cr. Prerequisite: Junior standing or consent of instructor. 10 WF. Mr. Vasiliev.

141. ENGLISH CONSTITUTIONAL HISTORY. Yr; 3 cr. Prerequisite: History 1, 2, or 5. 11 MWF. Mr. Reynolds.

179. EGYPTOLOGY. I; 2 cr. Prerequisite: Consent of instructor. 2:30 MW. Mr. Ranke.

253. LATIN PALEOGRAPHY. II; 1 cr. Elements of paleography, with practical exercises in reading of manuscripts. Not offered 1932-33.

254. SEMINARY IN ANCIENT HISTORY. Yr; 2 cr. Prerequisite: A reading knowledge of Greek and Latin. 2:30-4:30 Tu. Mr. Vasiliev.

257. SEMINARY IN MEDIEVAL HISTORY. Yr; 2 cr. Studies in the economic history of the Middle Ages. Prerequisite: A reading knowledge of Latin, French, and German. Not offered 1932-33.

279. EGYPTOLOGY. I; 2 cr. Prerequisite: Graduate standing. 2:30 TT. Mr. Ranke.

LECTURES ON EGYPTOLOGY. I; no credit. Open to the public. 4:30 TT. Mr. Ranke .

MODERN HISTORY

136. HISTORY OF FRANCE. Yr; 2 cr. Prerequisite: History 1 or 5, or junior standing. 11 TT. Mr. Schaff.

138. THE FRENCH REVOLUTION AND NAPOLEON Yr; 3 cr. Prerequisite: Junior standing or consent of instructor. Not offered 1932-33. Mr. Higby.

139. Europe Since 1815. Yr; 3 cr. Prerequisite: Junior standing. 11 MWF. Mr. Higby.

142. England Under the Tudors and Stuarts. Yr; 3 cr. Prerequisite: Junior standing or consent of instructor. Not offered 1932-33. 9 TT; conference. Mr. Knaplund.

143. The British Empire Since 1815. Yr; 3 cr. Prerequisite: Junior standing or consent of instructor. Not offered 1932-33. Mr. Knaplund.

144. Sixteenth-Century Civilization. 1; 3 cr. Prerequisites: History 1 or 2, and junior standing. 10 TT; conference. Mr. Sellery.

145. The Rise of Prussia. Yr; 2 cr. A pro-seminary in the history of the German people. Prerequisite: Consent of instructor. Not offered 1932-33. Mr. Easum.

146. History of the German People. Yr; 2 or 3 cr. A survey of German history from early times to the close of the nineteenth century. Prerequisite: Sophomore standing. 1:30 TT. Mr. Easum.

147. Modern Britain, 1815-1931. Yr; 3 cr. Prerequisite: Junior standing or consent of instructor. 9 TT; conference. Mr. Knaplund.

164. Historical Geography: The Great Discoveries, 1200-1750. II; 2 cr. Prerequisites: History 2, junior standing, or consent of instructor. Not offered 1932-33.

177. The Old Order and the Enlightened Despots, 1715-1789. I; 3 cr. Prerequisite: Junior standing. May not be taken with History 136. Not offered 1932-33.

178. Recent German History. I; 2 or 3 cr. Prerequisite: History 2, 139, or 146, or consent of instructor. 10 TT. Mr. Easum.

258. Seminary in History of the British Empire. Yr; 2 cr. A study of aspects of Britain's foreign relations, 1895-1914. 1:30-3:30 Tu. Mr. Knaplund.

267. Seminary in Modern European History. Yr; 2 cr. 3:30-5:30 F. Mr. Higby.

AMERICAN HISTORY

111. History of the West, 1763-1893. Yr; 3 or 4 cr. Prerequisite: Junior standing. 9 MWF. Mr. Hicks.

112. Representative Americans. II; 3 cr. Prerequisite: History 4a or junior standing. Not offered 1932-33. Mr. Fish .

116. American Colonial History. Yr; 3 or 2 cr. Prerequisite: An elementary course or junior standing. 8 MWF. Mr. Nettels.

117. American Constitutional History, 1600-1925. Yr; 3 or 2 cr. Prerequisite: An elementary course or junior standing. 1:30 MWF. Mr. Otis.

118. Civil War and Reconstruction, 1860-1876. II; 3 cr. Prerequisite: History 4a or junior standing. 1:30 MWF. Mr. Fish.

120. American Foreign Policy, 1783-1932. I; 3 cr. Prerequisite: History 4 or junior standing. 1:30 MWF. Mr. Fish.

122. American Economic Life. Yr; 3 or 2 cr. Prerequisite: An elementary course or junior standing. 10 MWF. Mr. Nettels.

124. Recent History of the United States, 1865-1931. Yr; 3 or 4 cr. Prerequisite: Junior standing. 11 MWF. Mr. Hicks.

128. The United States During the World War, 1914-1921. I; 3 or 4 cr. Prerequisite: Junior standing. Not offered 1932-33.

261. Seminary in American History. Yr; 2 cr. Sudies in social and economic problems of the Civil War and Reconstruction periods in their relation to politics. 3:30-5:30 Tu. Mr. Fish.

262. Seminary in American History. Yr; 2 cr. Studies in recent and in western history. 2:30-4:30 M. Mr. Hicks.

263. Seminary in American History. Yr; 2 cr. Studies generally relating to American economic history or to the history of the English colonies in America. 3:30-5:30 F. Mr. Nettels.

ITALIAN

(See page 143)

JOURNALISM

Willard Grosvenor Bleyer, Ph.D., *Professor of Journalism, Chairman* (on leave I)
Grant Milnor Hyde, M.A., *Professor of Journalism* (on leave II)
Chilton Rowlette Bush, M.A., *Associate Professor of Journalism*
Helen Marguerite Patterson, M.A., *Assistant Professor of Journalism*
Ralph Otto Nafziger, M.A., *Assistant Professor of Journalism*
Bruce Riege McCoy, B.A., *Lecturer in Journalism*

Purpose and Plan. The courses in journalism are designed to give the student instruction and practice in newspaper writing and editing, in some kinds of magazine writing, and in advertising, as well as to present current problems of journalism in the light of their origin and development. They have been arranged to meet the needs of students in the School of Journalism, and those in the Colleges of Letters and Science, Agriculture, and Engineering who desire training in journalistic writing.

Laboratory Equipment. The department has a large laboratory equipped like the city room of a newspaper office, with typewriters, reference books, maps, and a copy-desk. Adjoining this are a reading room with current files of representative American newspapers and journalistic periodicals, and a lecture room. To familiarize students of journalism with the principles of typography, the department has a typographical laboratory for practical work in connection with the courses in editing, advertising, and newspaper administration.

FEES. A laboratory fee of $1.00 per semester is charged each student taking courses in journalism, except those in Journalism 1; additional fees are charged in Journalism 3 and 4.

MAJOR. The undergraduate major in journalism is offered only to candidates for the degree of Bachelor of Arts (Journalism). It requires not less than 31 credits, as outlined under the heading School of Journalism, on page 88.

*1. GENERAL SURVEY OF JOURNALISM. Yr; 1 cr. Required of freshmen in the pre-journalism sequence. Practical talks on the character and scope of journalistic work, including a consideration of newspapers, magazines, technical and trade journals, agricultural publications, advertising, etc. 2:30 Tu. Mr. Hyde.

2. NEWSPAPER REPORTING AND CORRESPONDENCE. Yr; 3 cr. Lectures and practice on the work of the reporter and the correspondent, including news gathering and writing. Students cover at least one newspaper assignment each week and have one weekly conference with the instructor. Required of all students in the School of Journalism excepting those in the Journalism-Advertising Group. 10 or 11 MWF. Mr. Hyde and staff.

*3. COPY READING. Yr; 3 cr. Prerequisite: Nine grade-points in Journ. 2. 8 M and lab. Lab. fee $1.50 per semester. Mr. Nafziger.

*4. ADVERTISING TYPOGRAPHY. II; 1 cr. Two hours a week of instruction and laboratory work in the typography of advertisements. Required of students in the Journalism-Advertising Group. Lab. fee $1.00. Mr. Nafziger.

*7. THE COMMUNITY NEWSPAPER. I; 2 cr. Open only to juniors and seniors. 8 TT. Mr. McCoy.

*8. NEWSPAPER BUSINESS MANAGEMENT. II; 2 cr. Open only to juniors and seniors. 10 TT. Mr. McCoy.

*13. MARKETING METHODS. See Economics 13.

14. GERMANY OF TODAY. See German 14.

*15. PRINCIPLES OF ADVERTISING. See Economics 15.

17. SPAIN AND SPANISH AMERICA OF TODAY. See Spanish 17-18.

18. FRANCE OF TODAY. See French 18.

19. ITALY OF TODAY. See Italian 19.

22. NEWS WRITING AND REPORTING. II; 3 cr. Required of students in the Journalism-Advertising Group. Mr. Hyde.

50-51. FREEHAND DRAWING AND ILLUSTRATION. See Art Education 50-51.

100. SENIOR THESIS. Yr; 2 cr. Staff.

104. EDITORIAL WRITING. II; 2 cr. Theory and practice of editorial writing; analysis of editorial policy; interpretation of current news. Required of all seniors in the School of Journalism. Prerequisites: Journalism 2 and 3. 9 TT. Mr. Bush.

*Does not count toward the requirements for graduation from the College of Letters and Science except for students in the School of Journalism, and in other special courses as follows: Journalism 3 and 8 count also in the School of Commerce.

105. WRITING OF SPECIAL ARTICLES. I; 2 cr. Lectures and practice in preparing special articles for newspapers and magazines. Not open to students below the junior year. Required of all students in the School of Journalism. Prerequisite: Journalism 2. 10 or 11 TT. Miss Patterson.

106. CRITICAL WRITING. II; 2 cr. The function of criticism in journalism; reviewing of motion pictures, plays, concerts, and books for newspapers. Open only to seniors. 9 TT. Mr. Bleyer.

107. TECHNICAL AND TRADE WRITING. II; 2 cr. Instruction and practice in the methods of popularizing scientific and technical material, including that in government and politics, economics, social service, and education. Prerequisite: Journalism 105. 11 TT. Mr. Bush, Mr. McCoy.

109. THE LAW OF THE PRESS. I; 1 cr. Lectures and readings on libel, constitutional guarantees, copyright, and other phases of the laws affecting newspapers and periodicals. Required of all seniors in the School of Journalism. Prerequisites: Journalism 2 and 3. 1:30 Th. Mr. Hyde.

110. HISTORY OF JOURNALISM. I; 3 cr. A study of the evolution of the newspaper in England and the United States, with special reference to the problems of present-day journalism. Required of all seniors in the School of Journalism. Prerequisites: Journalism 2 and 3. 9 MWF. Mr. Bush.

111. THE PRINCIPLES OF JOURNALISM. II; 3 cr. Lectures, reading, and discussion on the relation of the newspaper to government and society; the influence, ethics, and psychology of journalism. Required of all seniors in the School of Journalism. 9 MWF. Mr. Bleyer.

112. REPORTING OF PUBLIC AFFAIRS. I; 2 cr. Instruction and practice in the methods of reporting local, state, and federal courts; municipal, state, and federal administration; bankruptcy, politics, finance, and public affairs. Prerequisite: Journalism 2. 9 TT. Mr. Bush.

*116. PROBLEMS IN NATIONAL ADVERTISING. See Economics 116.

120. INTERESTING FOREIGN NEWS. II; 2 cr. Social, political, and economic conditions in European countries. Prerequisites: Journalism 2 and 3. 1:30-3:30 Tu. Mr. Bush.

121. INTERPRETING HISPANIC NEWS. I, II; 1 cr. 1:30 Th. Mr. Neale-Silva.

123. WOMEN'S DEPARTMENTS IN NEWSPAPERS AND MAGAZINES. II; 2 cr. The writing and editing of material for women's departments in newspapers and magazines; publicity work for social service and educational institutions; syndicates, etc. Prerequisite: Journalism 105. 10 TT. Miss Patterson.

200. RESEARCH. I, II; 2-4 cr. Research work on newspaper problems. Staff.

201. SEMINARY IN JOURNALISM. Yr; 2 cr. Subject for 1932-33: American newspapers from 1890 to 1900. Mr. Bleyer, Mr. Bush.

202. SEMINARY IN JOURNALISM. Yr; 2 cr. Subject for 1932-33: Public opinion and the press. Mr. Bleyer, Mr. Hyde.

LATIN

(See Classics, page 112.)

MATHEMATICS

MARK HOYT INGRAHAM, Ph.D., *Professor of Mathematics, Chairman*
RUDOLPH ERNEST LANGER, Ph.D., *Professor of Mathematics*
HERMAN WILLIAM MARCH, Ph.D., *Professor of Mathematics*
ERNEST BROWN SKINNER, Ph.D., *Professor of Mathematics*
CHARLES SUMNER SLICHTER, Sc.D., *Professor of Applied Mathematics*
WARREN WEAVER, Ph.D., *Professor of Mathematics* (on leave 1932-33)
THEODORE BENNETT, Ph.D., *Assistant Professor of Mathematics*
HERBERT PULSE EVANS, Ph.D., *Assistant Professor of Mathematics*
IVAN STEPHAN SOKOLNIKOFF, Ph.D., *Assistant Professor of Mathematics*

INSTRUCTORS

FLORENCE ELIZA ALLEN, Ph.D.
JAMES JOSEPH BARRON, B.S.
RAY MOLTZNER ELY, M.A.
HAROLD DANIEL LARSEN, M.A.
ROBERT EDWARD LOWNEY, M.A.
ALBERT EMIL MAY, M.A.
JAMES STUART MCNAIR, M.S.
NATHAN SCHWID, M.A.
ELIZABETH STAFFORD SOKOLNIKOFF, Ph.D.
PAUL LEROY TRUMP, M.S.
KENNETH WARREN WEGNER, B.A.
NEILL GORDON WHITELAW, M.A.

In this department, courses 1 to 7 inclusive are planned to give a working knowledge of elementary mathematics. Mathematics 7 is required of students in the School of Commerce. Students who elect the minimum amount of mathematics in fulfillment of the optional requirement for the B.A. degree may choose eight credits from any of the elementary courses.

MAJOR IN MATHEMATICS. This field of concentration includes all courses taught by the Mathematics Department. The major comprises a minimum of 21 credits which shall consist of Courses 5 (or 54 and 55); 6; at least one of 102, 112, 113; and other courses in mathematics numbered 100 or above, excepting 136. Students majoring in this department must earn at least as many grade-points as credits in all work included in the major. Eligibility to write a thesis is based on a minimum of 9 credits in mathematics taken at the University of Wisconsin and is determined by the average number of grade-points per credit earned in the courses included in the major. Those whose average thus computed is at least 2.5 will write theses; those whose average is less than 2.0 are not permitted to write theses; those with intermediate averages are subject to individual rulings by the department, with consideration given to the students record and wishes. Students entering the junior class with advanced standing who expect to complete a major in mathematics in four semesters should previously have completed the equivalent of Mathematics 5.

MAJOR IN PHYSICS-MATHEMATICS. The courses listed below from (a) to (d) comprise the field of concentration in physics-mathematics. The major consists of the following required courses, with a maximum of 40 credits in groups (a) through (d) and a grand total of not more than 50 credits, including group (e).

(a) Mathematics—algebra and trigonometry (which may be completed in high school); analytic geometry and calculus.

(b) Physics 1, 31, or 51-52—10 credits.

(c) Mathematics 112, or its equivalent, 3 cr.; and a minimum of 6 credits selected from courses 102, 111, 113, 116, 118.

(d) A minimum of 6 credits selected from Physics 106, 115, 116, 117, 118, 124.

(e) A minimum of 6 credits selected from the following group of courses, which are within the division although not included within this field of concentration: Physics 2, 3, 4; Mathematics 101, 114, 115, 117; Metallurgy 135; Mechanics 101, 107, 110; Electrical Engineering 116, 120, 155; Chemistry 130; Hydraulics 104, 115; Astronomy 6, 7, 116.

THE JUNIOR MATHEMATICAL CLUB, open to all students interested in the subject, meets twice a month.

ELEMENTARY COURSES

1. ALGEBRA. I, II; 4 cr. For students presenting one or one and a half units of algebra for entrance. Prerequisite to all other courses. I—8, 9, 10, 11, 1:30, 2:30; II—10, 2:30. Mr. Skinner and staff.

2. TRIGONOMETRY AND ANALYTIC GEOMETRY. I, II; 4 cr. Prerequisite to all other courses except 1, 3, 7, and 24. I—9, 10, 11, 2:30; II—8, 9, 11, 1:30. Mr. Skinner and staff.

3. ANALYTIC GEOMETRY. I, II; 3 cr. Prerequisite: Trigonometry. I—11, 1:30 MWF; II—2:30 MWF. Staff.

5a. DIFFERENTIAL CALCULUS. I, II; 3 cr. Prerequisite (or co-requisite): Math. 2 or 3. Students who intend to major in mathematics or science are advised to take this course, together with 5b, in the sophomore year. Corresponds roughly to Math. 54, 4 cr., offered primarily for engineering students but open to others. I—10 MWF; II—9, 1:30 MWF. Staff.

5b. INTEGRAL CALCULUS. I, II; 3 cr. Prerequisite: Math. 5a. I—11 MWF; II—10 MWF. Staff.

6. DETERMINANTS AND ANALYTIC GEOMETRY OF THREE DIMENSIONS. I, II; 3 cr. Prerequisite: Math 5, 54, or concurrent registration. I—2:30 MWF; II—1:30 MWF. Staff.

7. THEORY OF INVESTMENT. I, II; 4 cr. Prerequisite: Math. 1 or 51. Primarily for students in the pre-commerce sequence. I—2:30 MTTF; II—8, 9, 11, 1:30, 2:30. Mr. Skinner and staff.

24. THEORY OF LIFE INSURANCE. II; 3 cr. Prerequisite: Math. 7 or equivalent. 2:30 MWF. Mr. Larsen.

50. SUBFRESHMAN ALGEBRA. I; no cr. For students who fail to pass the examination for admission to Math. 51. Staff.

51. ELEMENTARY MATHEMATICAL ANALYSIS. I, II; 5 cr. Required of freshmen in engineering. Mr. March and staff.

52. ELEMENTARY MATHEMATICAL ANALYSIS. I, II; 5 cr. A continuation of Math. 51. Required of freshmen in engineering. Mr. March and staff.

54. DIFFERENTIAL AND INTEGRAL CALCULUS. I, II; 4 cr. Required of all sophomores in engineering. Mr. March and staff.

55. CALCULUS. I, II; 4 cr. Continuation of Math. 54. Required of all sophomores in engineering. Mr. March and staff.

71. Mathematics for Agricultural Students. I; 4 cr. Staff.

91. College Geometry. II; 2 cr. An extension of the procedure and content of Euclidean geometry. Open to juniors and seniors. May be counted toward the mathematics requirements for the teaching major and minor. 8 TT. Mr. Hart.

ADVANCED COURSES

These courses are offered every year unless an exception is specifically noted.

Math. 5 or 55 is prerequisite to all courses in the following group, except 101, 115, 136, 137.

100. Senior Thesis. Yr; 2 cr. 9 TT. Mr. Evans.

101. Advanced College Algebra. Yr; 3 cr. An advanced course in algebra covering such topics as determinants, elimination, permutation and combinations, interpolation, and the theory of equations. Prerequisite: Mathematics 5b or concurrent registration. 8 MWF. Mr. Skinner.

102. Advanced Calculus. Yr; 3 cr. A year course in analysis based on the differential and integral calculus and containing the work usually given in advanced calculus and differential equations. 9 MWF. Mr. Langer.

110. Higher Mathematics for Engineers. Yr; 3 cr. 8 MWF. Mr. Sokolnikoff.

111. Advanced Calculus. I; 3 cr. Not offered 1932-33. Mr. Skinner.

112. Differential Equations. I, II; 3 cr. Primarily a working course for students in mathematics and physics. 10 MWF. Staff.

113. Theoretical Mechanics. Yr; 3 cr. 11 MWF. Mr. Slichter.

114. Modern Analytic Geometry. I; 3 cr. 1:30 MWF. Mr. Bennett.

115. Projective Geometry. II; 3 cr. 1:30 MWF. Mr. Bennett.

116. Higher Analysis. Yr; 3 cr. 9 MWF. Mr. March.

117. Vector Analysis. II; 3 cr. Not offered 1932-33.

118. The Theory of Probabilities and Methods of Least Squares. II; 3 cr. 11 TT and 3:30 M Mr. Evans.

119. Differential Geometry. II; 3 cr. Not offered 1932-33. Mr. Skinner.

136. Mathematics Preparatory to Statistics. I; 3 cr. A course in certain portions of calculus, analytic geometry, trigonometry, and interpolation which are used in statistics. This course is to prepare students, who can not take calculus, for Mathematics 137. Can not be counted toward the minimum requirement for a major in mathematics. Prerequisites: College algebra and a course in statistics or its equivalent, or consent of instructor. 2:30 MWF. Mr. Ingraham.

137. The Mathematics of Statistics. II; 3 cr. A course in curve fitting, correlation, dispersion, frequency distributions, graphical calculation, and portions of the theory of probability, including a certain amount of laboratory work. Prerequisites: Math. 136 or calculus and consent of instructor. 2:30 MWF. Mr. Ingraham.

GRADUATE COURSES

The graduate courses in mathematics are varied from year to year according to the needs of the students, other subjects being introduced in addition to those here listed. When there is no indication in the description of a course that it is given every year or every other year, this lack of information should be interpreted to mean that the course is given at irregular times.

218. SEMINARY IN THEORY OF PROBABILITY. Yr; 1 cr. Not offered 1932-33. Mr. Weaver.

219. DIFFERENTIAL GEOMERTY. Yr; 3 cr. A study of curves and surfaces in three dimensions by classical methods, followed by an introduction to corresponding problems in n-dimensions involving tensor methods. Offered 1932-33. Mr. Bennett.

220. THEORY OF ANALYTIC FUNCTIONS. Yr; 3 cr. This course, like Course 221, is fundamental in analysis, but its content is restricted to functions of the complex variable. It has accordingly special interest in the application of mathematics to physics. Offered 1933-34 and in alternate years. Mr. Langer.

221. THEORY OF FUNCTIONS OF A REAL VARIABLE. Yr; 3 cr. The aim of this course is to develop the fundamental concepts and theorems of analysis. It includes an introduction to the theory of point-sets. Offered 1932-33 and in alternate years. Mr. Langer.

238. THE MATHEMATICS OF ECONOMIC STATISTICS. I; 3 cr. Deals with the mathematics of problems peculiar to economic statistics such as secular trends, seasonal variation, correlation of time series, and index numbers. Prerequisites: Math. 136 and 137, or consent of the instructor. Given when demand warrants. Mr. Ingraham.

243. MODERN THEORY OF DIFFERENTIAL EQUATIONS. I; 3 cr. Not offered 1932-33. Mr. Langer.

244. HIGHER GEOMERTY. Yr; 3 cr. Not offered 1932-33. Mr. Bennett.

245. ALGEBRAIC GEOMETRY. Yr; 3 cr. Algebraic curves and their singularities; the geometry of the curve and the associated Riemann surface. Not offered 1932-33. Mr. Bennett.

246. FINITE GROUPS. Yr; 3 cr. Abstract groups with examples showing the most important modes of representation and with applications to fundamental problems in other branches of mathematics. Offered 1932-33 and usually in alternate years. Mr. Skinner.

247. TENSOR ANALYSIS. Yr; 3 cr. Not offered 1932-33. Mr. Weaver.

249. THEORETICAL HYDRODYNAMICS. I; 2 cr. Not offered 1932-33. Mr. Slichter.

250. THEORY OF ELASTICITY. Yr; 3 cr. Not offered 1932-33. Mr. March.

251. THEORY OF POTENTIAL. Yr; 2 cr. Not offered 1932-33. Mr. Weaver.

255. ADVANCED ALGEBRAIC THEORY OF EQUATIONS. I; 3 cr. Not offered 1932-33. Mr. Ingraham.

256. Advanced Analytic Theory of Equations. II; 3 cr. Not offered 1932-33. Mr. Ingraham.

257. Infinite Series of Functions. Yr; 3 cr. Not offered 1932-33. Mr. Langer.

258. Foundation of Analysis. Yr; 2 cr. Not offered 1932-33. Mr. Ingraham.

263. Higher Algebra. Yr; 3 cr. Matrices, linear dependence and independence, quadratic forms, elementary divisors, and the theory of infinite matrices. Offered 1932-33. Mr. Ingraham.

265. Harmonic Analysis. Yr; 3 cr. Boundary value problems connected with the partial differential equations of ordinary occurrence in mathematical physics. Fourier's series, series of Bessel's functions, and spherical harmonics. Offered 1933-34 and in alternate years. Mr. March.

266. Theory of Numbers. Yr; 3 cr. Theory of congruences and of algebraic integers. Offered 1933-34 and in alternate years. Mr. Skinner.

267. Calculus of Variations. I; 3 cr. An introductory course devoted to the classical theory and problems. Prerequisite: Differential and integrl calculus. Not offered 1932-33. Mr. Langer.

268. Partial Differential Equations. II; 3 cr. Not offered 1932-33. Mr. Langer.

269. Theory of Integral Equations. II; 3 cr. An introductory course. The classical approach to the equations of Volterra and Fredholm types. Not offered 1932-33. Mr. Langer.

270. Mathematical Bases of Theory of Relativity. II; 3 cr. Special and general relativity, the Lorentz transformation, quadratic differential forms, and the Absolute Calculus of Ricci and Levi-Civita. Not offered 1932-33. Mr. Weaver.

271. Linear Algebras. Yr; 3 cr. A course in the theory of linear associative algebras of finite order with an introduction to the recent work in algebras of infinite order. Not offered 1932-33. Mr. Ingraham.

272. Seminary in Algebra. Yr; 1 cr. Offered 1932-33. Mr. Ingraham.

275. Second Course in Theory of Functions. Yr; 3 cr. Not offered 1932-33.

278. Ordinary Differential Equations of a Complex Variable. I; 3 cr. A study of the properties and functional character of the solutions of ordinary differential equations in which the variables are complex. Some familiarity with the theory of functions of a complex variable is a requisite. Offered 1932-33. Mr. Langer.

TEACHERS' COURSE

The Teaching of Mathematics. See School of Education.

METEOROLOGY

ERIC REXFORD MILLER, M.S., *Lecturer in Meteorology*

1. WEATHER AND CLIMATE. I; 3 cr. Prerequisite: Physics 1 or high-school physics. Lecture, quiz, 10 MWF. Mr. Miller.

2. CLIMATE AND MAN. II; 3 cr. Prerequisite: Meteorology 1 or a course in physical geography. Lecture, quiz, 10 MWF. Mr. Miller.

103. METEOROLOGY. I; 3 cr. Prerequisites: Mathematics 5 or 54; Physics 2. Lecture, 2:30 MWF. Mr. Miller.

106. CLIMATOLOGY. II; 3 cr. Prerequisite: A course in statistics. Lecture, 2:30 MWF. Mr. Miller.

MUSIC

CHARLES HENRY MILLS, Mus.D., F.R.C.O., *Professor of Music, Chairman*
CECIL BURLEIGH, *Professor of Music*
EDGAR BERNARD GORDON, *Professor of Music*
LOUISE LOCKWOOD CARPENTER, B.M., *Associate Professor of Music*
LELAND AVERY COON, B.A., *Associate Professor of Music*
EDSON WILFRED MORPHY, *Associate Professor of Music*
EDWARD EARLE SWINNEY, B.A., B.M., *Associate Professor of Music*
ORIEN EMEAL DALLEY, B.M., *Assistant Professor of Music*
IRENE BELLE EASTMAN, B.M., *Assistant Professor of Music*
LEON LEONARD ILTIS, B.M., *Assistant Professor of Music*
FLORENCE BERGENDAHL, *Instructor in Music*
ANITA MATILDA HANKWITZ, M.M., *Instructor in Music*
PAUL GEORGE JONES, B.M., *Instructor in Music*
MARJORIE SCHOBEL, B.M., *Instructor in Music*
HELENE STRATMAN-THOMAS, B.M., M.A., *Instructor in Music*

See School of Music, page 99, for outline of four-year curriculum in music.

THEORY COURSES

1. HARMONY. Yr; 3 cr. Provides the student with a working knowledge of the chord material up to the dominant seventh.. Much attention is given during the first semester to such fundamentals of music theory as key signatures, major and minor scales, intervals, triads, and elementary chord progressions. From the first, the material of the course is used as a basis for keyboard harmony. All students are required to harmonize melodies and to transpose at the keyboard. The harmonizing of soprano melodies and the composition of original examples form a large part of the work of the second semester. 1:30 MWF. Miss Eastman and staff.

5. FORM AND ANALYSIS. I, II; 2 cr. Prerequisite: Music 11. A study of the various musical forms and the application of the structural and harmonic principles involved to the survey of representative works of the masters. 11 MF. Miss Thomas.

11. SECOND-YEAR HARMONY. Yr; 3 cr. Prerequisite: Music 1. 9 or 10 MWF. Miss Eastman.

21. COUNTERPOINT. Yr; 2 cr. Prerequisite: Music 1. 9 or 10 TT. Miss Thomas, Mr. Mills.

31. HISTORY OF MUSIC. Yr; 2 cr. An historical survey of the growth of music to the present day; the lectures are amply illustrated with examples of all music under survey. A student of this course should acquire a certain critical sense as to musical values, a keener sense of discrimination and taste, and the power to place a given piece of music in its historical period. 1:30 TT. Miss Thomas.

36. PEDAGOGY. (Piano, violin, voice, organ). I; 2 cr. An intensive analysis of technical and musical studies with reference to their use as teaching material. Evaluation of various means of presentation. Discussion of pedagogical theories of the past and present. Open only to juniors and seniors in School of Music. Prerequisites: Music 5, 31, 45, 75. Staff.

37. APPLIED PEDAGOGY. (Piano, violin, voice, organ). II; 2 cr. Actual private and class teaching under supervision. Lesson plans and weekly discussion of problems. Prerequisite: Music 36. Staff.

39. THEORY AND PRACTICE OF SUPERVISION. I; 3 cr. Laboratory and conference. Prerequisites: Music 51 and 53. 8 TT; 11 or 1 MWF. Mr. Gordon.

51. THEORY AND PRACTICE OF GRADE SCHOOL MUSIC. Yr; 2 cr. Laboratory and conference. 8 F; 1 MWF. Mr. Gordon.

53. THEORY AND PRACTICE OF SECONDARY SCHOOL MUSIC. I; 2 cr. Lecture and observation work in high-school music—vocal, appreciation, and instrumental. Prerequisite: Music 51 or concurrent registration. 11 TT. Mr. Gordon.

65. APPRECIATION OF MUSIC. Yr; 1 cr. A general survey of the development of music with practical illustrations. Open to the general student body. Prerequisite: Sophomore standing. 11 TT. Mr. Mills.

66. CONDUCTING. II; 2 cr. Prerequisite: Junior standing. 11 TT. Staff.

72. MUSIC EDUCATION FOR DANCE MAJORS. Yr; 1-2 cr. This course aims to stress the elements of musical structure and interpretation, to consider the various series of music texts and apply their material to the needs of dance teachers, to build up a repertory of music, and to develop the correlation of music and dance through its various stages. Miss Schobel.

75. SOLFEGGIO. Yr; 1 cr. Class and individual singing of different unison and part music involving all types of rhythms and intervals. Writing of two-part dictations. 9 or 10 TT. Mr. Dalley.

76. ORCHESTRA. Yr; 1 cr. Membership decided by tryouts. Open to entire student body. Only after two semesters in the orchestra may a student register for credit. Prerequisite: Ability to play some instrument. 4:30 MF; 7 W. Mr. Morphy.

78. COMMUNITY MUSIC. II; 2 cr. The ways in which music may be made a more potent social force; important developments here and abroad; programs of vocal and instrumental activities adapted to different types of communities; selection of material. Daily practice in conducting. For teachers of music, school principals, social workers, and citizens generally. Offered 1931-32 and in alternate years. 1:30 TT. Mr. Gordon.

80. BANDS. Yr. Prerequisite: Knowledge of some band instrument. 4:30 TT or 4:30 MWF. Mr. Morphy and staff.

89. INSTRUMENTAL CLASS INSTRUCTION. II; 2 cr. A practical class for acquiring an elementary playing and teaching knowledge of orchestral instruments. Prerequisite: Music 1. 2:30 MTTF. Mr. Dalley.

90. INSTRUMENTAL METHODS. I, II; 2 cr. A practical study of stringed and wind instrument methods. Prerequisite: Music 89. 2:30 MTTF. Mr. Dalley.

91. INSTRUMENTATION. I, II; 2 cr. A course in playing and writing for string, wood-wind, and brass ensembles. Prerequisite: Music 90. 3:30 MTTF. Mr. Dalley.

92. INSTRUMENTAL MUSIC ADMINISTRATION. (Orchestra) Yr; 3-4 cr. Problems of organizing instrumental classes, bands, and orchestras on the curricular or extra-curricular basis. Selection and care of instruments and music and practical experience in conducting and interpretation of music. Prerequisite: Music 89. Orhestra 4:30 TT; lab. 4:30 F. Mr. Dalley.

95. ELEMENTARY SURVEY. Yr; 2 cr. An advanced course in appreciation of music. Prerequisite: Senior sanding or consent of instructor. 10 MW. Mr. Mills.

100. SENIOR THESIS. Yr; 2 cr. Staff.

102. ELEMENTARY COMPOSITION. I, II; 2 cr. The study of the higher discords and post-Wagnerian technique. A study and analysis of the work of Strauss and Debussy. The encouragement of original work. Prerequisite: Music 11. 10 MW. Mr. Mills, Miss Thomas.

112. ADVANCED COUNTERPOINT. I, II; 2 cr. Prerequisite: Music 21. 10 TT. Mr. Mills.

122. DOUBLE COUNTERPOINT, CANON AND FUGUE. Yr; 2 cr. Analysis and composition. Examples taken from Bach and others of the classical period, as well as from modern masters. Prerequisite: Music 21. Mr. Mills.

131. ADVANCED HISTORY OF MUSIC. I, II; 2 cr. This course is divided into periods such as the following: The Clavecin period; Bach and Handel; the Classical school; the Romantic school; the Modern French school; the development of chamber music; Wagner. Each period is a semester course. Prerequisite: Music 31. 11 MW. Mr. Coon.

152. ADVANCED ORCHESTRATION. Yr; 2 cr. A study in the history of orchestration. Representative orchestral works will be studied by means of scores and phonograph records. Attendance at rehearsals of the University orchestra. Texts by Forsyth, Rimsky-Korsakow, Widor, and others are used as reference. Scoring for orchestra. Mr. Morphy.

162. COMPOSITION. Yr; 2 cr. Small forms, etc. Prerequisite: Music 102. Mr. Burleigh.

165. SURVEY OF MUSIC. Yr; 2 cr. A critical course in the study of the various forms and masterpieces of music. Prerequisite: Senior or graduate standing. 1:30 TT. Mrs. Carpenter.

181. Artist Course in Applied Music. Yr; 1 or 2 cr. Prerequisite: Graduate standing in applied music. Staff.

200. Graduate Thesis. Staff.

211. Modern Orchestration. Yr; 2 cr. A further study of modern methods in orchestration. Original work in composition for orchestra will be required. Prerequisite: Music 152. Mr. Morphy.

231. Research in History of Music. Yr; 2 cr. Prerequisite: Graduate standing. Mr. Mills.

265. Free Composition. Yr; *cr. Prerequisite: Music 162. Mr. Burleigh, Mr. Mills.

APPLIED MUSIC

Students registering for any of the courses listed below should consult the assignment committee at the School of Music before filling in any definite class hours on their study lists.

70. Piano Technic. Yr; 0 cr. The study of hand position, finger action, scales, and arpeggios. Required of all first-year students in piano and others whom the instructors designate. Classes of eight students meeting two hours per week. Lab. fee $4.00. 9, 10, 11, 1:30 TT. Mr. Jones.

81. Pianoforte. 0-2 cr. In addition to the private lessons, each first-year student taking piano for credit is required to enroll in a technic class. Fee $25-$45. Mrs. Carpenter, Mr. Coon, Miss Hankwitz, Mr. Iltis.

82. The Art of Singing. 0-2 cr. The technique of tone production; correct principles of breathing; the vocal organs and their action; study of diction, English, French, German, and Italian; study of repertoire to cover all types of song literature; stage deportment; ensemble classes; recital and concert appearance. Fee $25-$45. Mr. Swinney, Miss Schobel, Miss Bergendahl.

83. Stringed and other Orchestral Instruments. 0-2 cr. Individual instruction. Fee $25-$45. Mr. Burleigh, Mr. Dalley, Mr. Morphy.

84. Organ. 0-2 cr. Individual instruction. Prerequisite: A satisfactory pianoforte technique, and some skill in polyphonic playing. Fee $25-$45 Miss Eastman, Mr. Jones, Mr. Mills.

85. Ensemble. 1 cr. Prerequisite: A degree of playing or singing ability determined by the instructor. This course is designed for pianists, singers, and players of orchestral instruments. Assignments in practical accompanying of the voice and violin or other instruments; violin and piano sonata playing; four and eight-hand arrangements of symphonies and orchestral works; two-piano compositons; string ensemble literature; string quartets; string and woodwind quintets and sextets. In the case of vocalists, the University Singers or the A Cappella Choir. Required of all applied music majors for both semesters of the senior year. Staff.

87. Class Piano for Public School Music Majors. 2 cr. One hour of technic in a class of eight, and two hours of piano in a class of four. Required of all public school music majors. Basic principles of technic, scales, and arpeggios in all major and minor keys; the complete cadence in all keys; sight reading; simple chord analysis; correct playing of folk songs, hymns, and the simpler choral literature, with a view to accompanying groups; transposition a second or third up or down; keyboard harmonization of simple melodies. Fee $45. 9, 10, 11, 1:30 MWF. Piano staff.

88. Class Voice for Public School Music Majors. 2 cr. A course primarily for those majoring in public school music and a prerequisite to Course 82 for all such majors. The work is given in classes of four meeting three hours per week and includes the fundamental principles of voice production, correct concept of tone, interpretation, and ensemble singing. Fee $45. 9, 10, 11, 1:30 MWF. Voice staff.

181. Artist Course in Applied Music. Yr; *cr. Prerequisite: Graduate standing in Applied Music. Fee $25-$45. Staff.

NORSE

(See Scandinavian Languages, page 189.)

PHARMACY

Edward Kremers, Ph.D., Ph.M., Sc.D., *Professor of Pharmaceutical Chemistry, Chairman*
William Oscar Richtmann, Ph.D., *Associate Professor of Pharmacognosy*
Nellie Antoinette Wakeman, Ph.D., *Assistant Professor of Pharmacy*
Ralph William Clark, M.S., *Instructor in Pharmacy*

PHARMACY

1. Orientation in Pharmacy. Yr; 3 cr. Required of freshmen in the Course in Pharmacy. Lab. fee $5.00 per semester. 1:30 MW; 3 hours lab. Staff.

20. Elementary Prescription Practice. Yr; 2 cr. The compounding and the study of simple prescriptions. Lab. fee $5.00 per semester. 11 TT; 3 hours lab. Mr. Clark.

30. Pharmaceutical Technology. 1; 5 cr. An elementary course in the preparation of pharmaceutical products. Prerequisites: Chemistry 20 and Ph. Chem. 26 or concurrent registration. Lab. fee $15.00. 1:30 TT; 8 hours lab. Mr. Clark.

50. History of Pharmacy. Yr; 1 cr. The development of pharmacy in the principal countries of Europe, followed by a more detailed study of the development of pharmacy in the United States. Offered 1932-33 and in alternate years. 3:30 F. Mr. Kremers.

51. Drug-Store Practice. Yr; 1 cr. Lectures and topics on aspects of drug-store practice ranging from the planning and equipment of a store to salesmanship and the laws governing the practice of pharmacy. Offered 1931-32 and in alternate years. 3:30 F. Mr. Kremers and special lectures.

100. Senior Thesis. Yr; 2-3 cr. Lab. fee $5.00 per semester. Staff.

121. Advanced Prescription Practice. II; 2 cr. A study of classes of modes of administration with special reference to incompatibilities. Prerequisites: Pharmacy 20, Ph. Chem. 26 and 27. Lab. fee $5.00. 1:30 Tu; 2 hours lab. Mr. Clark.

124. Dispensary Practice. I, II; 2 cr. Dispensary problems; hospital practice. Prerequisite: Consent of instructor. Lab. fee $5.00. 2:30-4:30 M. Mr. Clark.

131. Advanced Pharmaceutical Technology. Yr; 1-5 cr. Problems in the preparation of pharmaceutical preparations. Lab. fee $5.00 per lab. credit. Mr. Clark.

160. Pharmaceutical Literature. Yr; 1 cr. Mr. Kremers.

232. Graduate Pharmaceutical Technology. Yr; 1-5 cr. Lab. fee $5.00 per credit, maximum of $25.00. Mr. Kremers.

250. Conference of Research Workers. Yr; 1 cr. Mr. Kremers.

PHARMACEUTICAL AND PLANT CHEMISTRY

26. Inorganic Pharmaceutical Chemistry. I; 5 cr. A review of the principles of inorganic chemistry with special attention to methods for preparing and testing medicinal chemicals. Prerequisites: General chemistry and quantitative analysis. Lab. fee $15.00. 9 MWF; 6 hours lab. Miss Wakeman.

27. Organic Pharmaceutical Chemistry. II; 5 cr. A review of the principles of organic chemistry with special reference to organic medicinal chemicals. Prerequisite: Organic chemistry. Lab. fee $15.00. 9 MWF; 6 hours lab. Miss Wakeman.

40. Plant Chemistry. Yr; 3 cr. An elementary study of plant products and plant chemical processes. Prerequisite: Consent of instructor. Lab. fee I, $15.00; II, $10.00. 11 TT; 6 hours lab. Miss Wakeman.

45. Alkaloidal Assay. II; 1 cr. A study of chemical methods for determining the alkaloidal content of crude drugs and pharmaceutical preparations. Lab. fee $5.00. Last six weeks of Ph. Chem. 40. Miss Wakeman.

100. Senior Thesis. Yr; 2 cr. Lab. fee $5.00 per semester. Staff.

127. Synthetic Organic Remedies. Yr; 1-5 cr. The preparation and properties of synthetic organic remedies. Prerequisite: Consent of instructor. Lab. fee $5.00 per lab. credit. Miss Wakeman.

200. Graduate Research. Yr; 2-6 cr. Volatile oils and other subjects of organic chemistry, with special reference to plant chemistry. Lab. fee $5.00 per lab. credit, maximum of $25.00. Mr. Kremers.

241. Advanced Plant Chemistry. Yr; 2 cr. 10 TT. Mr. Kremers.

PHARMACOGNOSY

10. Crude Vegetable and Animal Drugs. Yr; 1 cr. An introductory course in pharmacognosy based upon a morphological arrangement. 10-12 Tu or Th. Mr. Richtmann.

21. Doses of Vegetable and Animal Drugs. I, II; 1 cr. A general consideration of the various items associated with doses of medicines. Prerequisites: Pharmacognosy 10, Botany 1, Chemistry 1. Mr. Richtmann.

22. Habitats of Crude Vegetable and Animal Drugs. I, II; 1 cr. A study of various factors influencing the geographic sources of natural remedial agents. Mr. Richtmann.

100. Senior Thesis. Yr; 2 cr. Lab. fee $5.00 per semester. Mr. Richtmann.

110. Sources of Information of Crude Vegetable and Animal Drugs. I, II; 1-5 cr. The use of the library in locating the literature relating to drugs. Mr. Richtmann.

120. Natural History of Vegetable and Animal Drugs. Yr; 3 cr. A monographic study of a considerable number of drugs, based on their natural relationships. Prerequisites: Pharmacognosy 10, Botany 1, Chemistry 1. Lab. fee $5.00. 8-10 MWF. Mr. Richtmann.

130. Cultivation of Medicinal Plants. Yr; 1-5 cr. Mr. Richtmann.

200. Research in Medicinal Plants. Yr; 1-5 cr. Lab. fee $5.00 per lab. credit. Mr. Richtmann.

PHILOSOPHY

Evander Bradley McGilvary, Ph.D., *Professor of Philosophy, Chairman*
Alexander Meiklejohn, Ph.D., LL.D., *Professor of Philosophy*
Max Carl Otto, Ph.D., *Professor of Philosophy*
Frank Chapman Sharp, Ph.D., *Professor of Philosophy*
Philip Gorder Fox, M.A., *Associate Professor of Business Administration*
Carl Möller Bögholt, B.S., *Assistant Professor of Philosophy* (on leave I)
Adolph Theodore Haentzschel, Ph.D., *Lecturer in Philosophy*
John Walker Powell, Ph.D., *Instructor in Philosophy*
Albert Gustav Ramsperger, Ph.D., *Instructor in Philosophy*
Eliseo Vivas, B.A., *Instructor in Philosophy*

The student is at liberty to begin his work in philosophy with any of the courses numbered under one hundred, but beginners who desire to take three hours of work throughout the year in the department, whether they wish to continue with the subject or not, will ordinarily find it most profitable to select course 11, 21, 31, or 41 in the first semester, and either 11, 21, or 132 in the second semester. None of the courses in this department is open to freshmen.

Major. The minimum requirement is 25 credits including courses 31 and 132, and 9 additional credits in the 100 group. A thesis may be included in these 25 credits at the option of the department.

11. Elementary Logic. I, II; 3 cr. Eight sections. Prerequisite: Sophomore standing. Mr. Otto, Mr. Bögholt, Mr. Haentzschel, Mr. Ramsperger, Mr. Powell.

21. Introduction to Philosophy. I, II; 3 cr. Prerequisites: Sophomore standing and upper-group status. Lecture 10 WF; quiz. Mr. McGilvary.

25. The Relation of Man to Nature. II; 3 cr. Prerequisite: Junior standing. Lecture 10 TT; quiz. Mr. Otto and staff.

31. History of Ancient and Medieval Philosophy. I; 3 cr. Prerequisite: Sophomore standing. 11 MWF. Mr. Vivas.

41. Introductory Ethics. I; 3 cr. A study of our standards of right and wrong: their nature, source, and value. Prerequisite: Sophomore standing. 9 MW; quiz. Mr. Sharp.

43. Business Ethics. I, II; 2 cr. The rules of fair competition. Standards of fair service. Fair price, fair wage, and the justice of the present system of distributing wealth. Prerequisite: Sophomore standing. 9, 10, or 11 TT. Fee $1.00. Mr. Sharp, Mr. Fox.

44. Schopenhauer and Nietzsche. II; 3 cr. Selections from the work of both philosophers will be critically studied in order to acquaint the student with their leading ideas. Prerequisite: Philosophy 21, 25, 31, or 132. 1:30 MWF. Mr. Vivas.

53. Elements of Aesthetics. I; 3 cr. An attempt is made in this course to discuss some of the more fundamental problems of beauty and the relation of art to other expressions of human activity. Prerequisite: Sophomore standing. 1:30 MWF. Mr. Vivas.

57. Theories of Human Destiny. I; 3 cr. A discussion of outstanding ancient and modern views on the destiny of man. Prerequisite: Sophomore standing. 11 MWF. Mr. Haentzschel.

100. Senior Thesis. Yr; 2 cr. Staff.

120. Philosophy of Science. I; 3 cr. A study of the extent to which science involves a theory of reality, a theory of knowledge, and a theory of values. Prerequisite: Philosophy 21, 25, 31, or 132. 10 MWF. Mr. Ramsperger.

124. Philosophical Bearings of Current Psychological Theories. II; 3 cr. With special reference to behaviorism and Gestalt psychology. Prerequisite: Philosophy 21, 25, 31, or 132. 10 MWF. Mr. Haentzschel.

132. History of Modern Philosophy. II; 3 cr. Prerequisite: Philosophy 31. 11 MWF. Mr. Vivas.

134. Contemporary Philosophy. Yr; 3 cr. Prerequisite: Philosophy 21, 31, 25, or 132. 11 MWF. Mr. McGilvary.

135. Descartes, Spinoza, and Leibniz. II; 3 cr. Prerequisite: Philosophy 21, 25, 31, or 132. Offered 1932-33 and in alternate years. Mr. Ramsperger.

136. Locke, Berkeley, and Hume. I; 3 cr. Prerequisite: Philosophy 21, 25, 31, or 132. 11 TT and third hour. Mr. Ramsperger.

137. The Philosophy of Kant. II; 3 cr. Prerequisite: Philosophy 21, 25, 31, or 132. 1:30 TTF. Offered 1933-34 and in alternate years. Mr. Ramsperger.

139. American Philosophers. I; 3 cr. With special reference to William James and John Dewey. Prerequisite: 3 cr. in philosophy. 10 TT; quiz. Mr. Otto.

145. Plato's Republic. II; 2 cr. Prerequisite: Philosophy 21, 25, 31, or 41. 1:30 TT. Mr. Sharp.

146. Advanced Business Ethics. II; 2 cr. Prerequisite: Philosophy 43. 11 TT. Mr. Sharp.

162. Idealism versus Pragmatism. I; 3 cr. Prerequisite: Philosophy 11, 21, 25, 31, or 132. 11 TTq. Mr. Meiklejohn.

213. Logical Seminary. Yr; 2 cr. Offered 1931-32 and in alternate years. Mr. Otto.

217. Seminary, Contemporary Theories of Human Nature. Yr; 2 cr. Offered 1932-33 and in alternate years. Mr. Otto.

240. Metaphysical Seminary. Yr; 2 cr. Mr. McGilvary.

247. Ethical Seminary. Yr; 2 cr. Mr. Sharp.

PHYSICS

Charles Elwood Mendenhall, Ph.D., *Professor of Physics, Chairman*
Leonard Rose Ingersoll, Ph.D., *Professor of Physics*
John Ransom Roebuck, Ph.D., *Professor of Physics*
John Hasbrouck Van Vleck, Ph.D., *Professor of Physics*
William Frederick Steve, M.A., *Associate Professor of Physics*
Hugo Bernard Wahlin, Ph.D., *Associate Professor of Physics*
Julian Ellis Mack, Ph.D., *Assistant Professor of Physics*
John Gibson Winans, Ph.D., *Assistant Professor of Physics*
Leland John Haworth, Ph.D., *Instructor in Physics*
Ragnar Rollefson, Ph.D., *Instructor in Physics*

In order to adapt the instruction in physics to students of different purpose and degree of preparation, the introductory course is given in two divisions designated as courses 1 and 31. Course 1 is arranged primarily for those who are taking this subject for its general interest. Course 31 is intended for those who need or desire a more fundamental training, and presupposes either high-school physics or freshman mathematics, or concurrent registration in the latter.

Major in Physics. This field of concentration includes all courses taught by the Department of Physics. A minimum of 26 credits is required, which shall include the following courses: 1 or 31 (or 51-52), 2, 3, 4a, and 100. The remaining credits are to be selected from 4b, 7, 10, 106, 115, 116, 117, 118, 124. A major in physics normally includes a thesis, which is usually an account of a piece of experimental work done largely on the student's own initiative. For the few who are handicapped in experimental work, an essay on an approved physical subject involving a search of some literature may be offered as a substitute. For those sufficiently prepared in mathematics, a theoretical thesis may be offered.

For teaching major and minor see School of Education.

MAJOR IN PHYSICS-MATHEMATICS. The courses listed below from (a) to (d) comprise the field of concentration in physics-mathematics. The major consists of the following required courses, with a maximum of 40 credits in groups (a) through (d) and a grand total of not more than 50 credits, including group (e).

(a) Mathematics—algebra and trigonometry (which may be completed in high school); analytic geometry and calculus.

(b) Physics 1, 31, or 51-52—10 credits.

(c) Mathematics 112, or its equivalent, 3 cr.; and a minimum of 6 credits selected from courses 102, 111, 113, 116, 118.

(d) A minimum of 6 credits selected from Physics 106, 115, 116, 117, 118, 124.

(e) A minimum of 6 credits selected from the following group of courses, which are within the division although not included within this field of concentration: Physics 2, 3, 4; Mathematics 101, 114, 115, 117; Metallurgy 135; Mechanics 101, 107, 110; Electrical Engineering 116, 120, 155; Chemistry 130; Hydraulics 104, 115; Astronomy 6, 7, 116.

1a. GENERAL PHYSICS. I; 5 cr. Mechanics, heat, magnetism, static electricity. (See also Physics 31.) Lab. fee $7.00. Lecture 11 or 1:30 MWF; 4 hrs. lab; one quiz. (Repeated second semester; lecture 2:30 TT.) Mr. Steve, Mr. Ingersoll and staff.

1b. GENERAL PHYSICS. II; 5 cr. Current electricity, sound, and light. Prerequisite: Physics 1a. Lab. fee $7.00. Lecture 11 or 1:30 MWF; 4 hrs. lab; one quiz. (Repeat first semester; lecture 2:30 TT.) Mr. Steve, Mr. Ingersoll, and staff.

2. HEAT. I; 3 cr. Prerequisite: Physics 1 (or 31, 52, or 54). Lab. fee $6.50. Lecture-conference 9 Th; lab. 1:30-5:30 Th. Mr. Roebuck.

3. LIGHT. II; 3 cr. Prerequisite: Physics 1 (or 31, 52, or 54). Lab. fee $6.50. Lecture-conference 9 Th; lab. 1:30-5:30 Th. Mr. Roebuck.

4. ELECTRICITY AND MAGNETISM. Yr; 3 cr. Prerequisite: Physics 1 (or 31, 52, or 54). Lab. fee $6.00 per semester. Lecture-conference 9 Tu; lab. 1:30-5:30 Tu. Mr. Wahlin.

7. PHOTOGRAPHY. II; 2 cr. Prerequisite: Consent of instructor. Lab. fee $4.50. Lecture 11 Tu; lab. 1:30-4:30 Tu. Mr. Mack.

10. LABORATORY ARTS. I; 1 cr. Glass blowing and shop work. Required for Physics 100. Lab. fee $3.00. Mr. Roebuck.

17. SURVEY OF PHYSICS: NATURE OF THE PHYSICAL WORLD. I; 4 cr. A brief course designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Open to all students, excepting those who have taken a more extended introductory course in physics. Three lecture-conferences per week (8 MWF) in which the phenomena of physics are demonstrated and discussed from both the older and newer viewpoints in an essentially non-mathematical manner; one two-hour laboratory period per week. Lab. fee $3.00. Mr. Ingersoll and staff.

31. General Physics. Yr; 5 cr. Prerequisite: High-school physics or freshman mathematics, or concurrent registration in the latter. Recommended for students who expect to major in physics or chemistry. Lab. fee $7.00 per semester. Lecture 11 F; 4 hrs. lab; 3 hrs. quiz. Mr. Roebuck, Mr. Winans, Mr. Ingersoll, and staff.

51. General Physics. I; 5 cr. Mechanics, wave motion, and heat. Required of sophomores in civil, chemical, mechanical, and mining engineering. Lab. fee $7.00. Lecture 3:30 M or W; 4 hrs. lab; 3 hrs. quiz. Mr. Ingersoll, Mr. Roebuck, and staff.

52. General Physics. II; 5 cr. Magnetism, electricity, sound, and light. Continuation of Physics 51. Lab. fee $7.00. Lecture 3:30 M or W; 4 hrs. lab; 3 hrs. quiz. Mr. Ingersoll, Mr. Roebuck, and staff.

53. Mechanics. I; 3 cr. Required of sophomores in electrical engineering. Lab. fee $3.60. Lecture 8 F; 2 hrs. lab; 1 hr. quiz; 2 hrs. comp. Mr. Wahlin and staff.

54. Heat, Wave Motion, Sound, and Light. II; 3 cr. Continuation of Physics 53. Lab. fee $3.60. Lecture 8 F; 2 hrs. lab; 1 hr. quiz; 2 hrs. comp. Mr. Wahlin and staff.

55. Advanced Electricity and Magnetism. I; 3 cr. Required of juniors in electrical engineering. Lab. fee $6.00. Lecture-conference 1:30 F; 4 hrs. lab. Mr. Wahlin and staff.

56. Advanced Electricity and Light. II; 3 cr. Required of seniors in electrical engineering. Lab. fee $6.50. Lecture-conference 1:30 F; 4 hrs. lab. Mr. Roebuck, Mr. Wahlin, and staff.

61. General Physics. II; 5 cr. For agricultural students. Lab. fee $7.00. Lecture 10 TT; 4 hrs. lab; 2 hrs. quiz. Mr. Steve.

65. General Physics. Yr; 3 cr. Required of sophomores in physical education and home economics. Lab. fee $3.60 or $5.00 per semester. Lecture 11 Tu; 2 or 3 hrs. lab; 2 hrs. quiz. Mr. Winans, Mr. Ingersoll, and staff.

91. Sound. II; 1 cr. Required of music students. Lecture-conference 2:30 F. Mr. Winans.

100. Senior Thesis. Yr; 2 cr. Lab. fee $3.00 per credit. Staff.

106. Ionization in Gases and Related Phenomena. I; 2-3 cr. 8 MW. Mr. Winans.

115. Introduction to Thermodynamics. I; 3 cr. 8 TTS. Mr. Roebuck.

116. Electric Circuits and Electromagnetic Waves. I; 3 cr. 10 MWF. Mr. Wahlin.

117. Physics Optics. II; 3 cr. 9 TTS. Mr. Ingersoll.

118. Kinetic Theory of Gases. I; 3 cr. 9 TTS. Mr. Ingersoll.

120. Colloquium. Yr; 1 cr. 4 F. Mr. Mendenhall.

124. Mathematical Theory of Heat Conduction. II; 3 cr. 10 TTS. Mr. Ingersoll.

200. Graduate Research. Yr; *cr. Lab. fee $3.00 per credit. Staff.

211. Advanced Dynamics. Yr; 3 cr. Offered 1931-32 and in alternate years.

212. Quantum Mechanics and Atomic Structure. Yr; 3 cr. 10 MWF. Mr. Van Vleck, Mr. Langer.

214. Application of Thermodynamics to the Properties of Matter. II; 3 cr. Offered 1931-32 and in alternate years. 8 TTS. Mr. Roebuck.

215. Theory of Electricity. Yr; 3 cr. Offered 1932-33 and in alternate years. 11 MWF. Mr. Sokolnikoff, Mr. Van Vleck.

216. Electromagnetic Theory of Light. Yr; 3 cr. Offered 1931-32 and in alternate years. 8 MWF. Mr. Mendenhall.

219. Theory of Radiation. I; 3 cr. Offered 1932-33 and in alternate years. 8 MWF. Mr. Mendenhall.

225. Seminary, Electron Theory of Solids. II; 3 cr. 8 MWF. Mr. Mendenhall.

233. Continuation of Advanced Quantum Mechanics. Yr; 2 cr. 11 TT. Mr. Van Vleck.

TEACHERS' COURSE

The Teaching of Physics. See School of Education.

PHYSIOLOGY

Walter Joseph Meek, Ph.D., *Professor of Physiology, Chairman*

17. Survey of Physiology: Functions of the Human Body. I; 4 cr. A brief course designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Should preferably be preceded by a course in chemistry, but open to all students. Lectures, quizzes, and demonstrations giving a general knowledge of the structure and functions of the human body. 10 MWF; lab. 1:30-3:30 or 3:30-5:30 Th. Lab. fee $3.00. Mr. Meek.

Physiology is a department of the Medical School, the announcement of which should be consulted for information relative to other courses .

POLITICAL SCIENCE

FREDERIC AUSTIN OGG, Ph.D., LL.D., *Professor of Political Science, Chairman*
JOHN MERRIMAN GAUS, Ph.D., *Professor of Political Science*
CHESTER LLOYD JONES, Ph.D., *Professor of Economics and Political Science*
WALTER RICE SHARP, Docteur en Droit, *Professor of Political Science*
JOHN T. SALTER, Ph.D., *Associate Professor of Political Science*
GRAYSON LOUIS KIRK, Ph.D., *Assistant Professor of Political Science*
LLEWELLYN PFANKUCHEN, Ph.D., *Instructor in Political Science*

The courses offered by the Department of Political Science are designed to afford a well-rounded view of the nature and activities of government and to give substantial acquaintance with public affairs, state and local, national, and international. Some of them are intended primarily to furnish information requisite for intelligent citizenship, along with the mental training which forms a part of any liberal education. Others involve more specialized study, with a view to expert knowledge of legislation, administration, judicial procedure, diplomacy, and public law. Except as qualified by the prerequisites indicated below, courses are open to students who have completed their freshman year and all are elective. Courses 1 and 7 are normally given every semester, and, being designed for sophomores, serve as alternative gateways to the more advanced and specialized courses. Except in unusual cases, students should not take both 1 and 7.

MAJOR IN SOCIAL SCIENCE WITH POLITICAL SCIENCE AS A FIELD OF CONCENTRATION. The requirements in political science when offered as a field of concentration are: (1) 25 credits, including thesis if one is written; (2) course 1 or course 7; (3) other courses so selected that the total political science offering will include at least one general course in each of the first four groups enumerated below. Students offering this field may be required to take courses outside of the department which are related to their political science programs.

THESIS. Students who, by their attainments in political science, and by personal characteristics, aptitudes, and interests, have shown that they can probably gain more from a thesis than from work for equivalent credits in courses, will be invited by their advisor to write a thesis (4-6 cr.).

HISPANIC STUDIES AS A FIELD OF CONCENTRATION. Students interested in this field should consult the announcement on page 58.

I. POLITICAL THEORY AND JURISPRUDENCE

1. INTRODUCTION TO GOVERNMENT AND POLITICS. I, II; 3 cr. Not open to freshmen. The meaning of citizenship in our modern world, as revealed by a survey study of public opinion, political parties and propaganda, political leadership, the legislative process, administrative areas and services, the judicial process, and civil liberty. Based primarly upon American problems, but with some reference to foreign states and world politics. Lectures by members of the department, discussions, laboratory problems. Not offered 1932-33. Mr. Gaus and staff.

2. ELEMENTARY LAW AND JURISPRUDENCE. II; 3 cr. Prerequisite: Sophomore standing. The nature, origin, and development of our legal system; the general rules governing contracts, torts, crimes, etc.; administrative tribunals, and the liability of public officers; problems of judicial organization and procedure. Not offered 1932-33.

101. Elements of Political Science. I, II; 3 cr. Prerequisite: Junior standing. A survey of the principles of political organization and practice. 11 MWF.

109. Roman Law. I; 3 cr. Prerequisite: Junior standing. Not offered 1932-33.

165. History of American Political Ideas. I; 2 cr. Prerequisite: Sophomore standing. An historical and analytical survey. The major political ideas of each historical period in relation to the social and economic environment and the political controversies of the time. 9 MW. Mr. Pfankuchen.

166. Contemporary American Political Thought. II; 2 cr. Mr. Pfankuchen.

239. Seminary in Public Opinion. Yr; 2 cr. Not offered 1932-33.

245. History of European Political Thought. Yr; 3 cr. Prerequisite: Graduate standing or consent of instructor. The political thought developed out of the Greek city state, the Roman Empire, the medieval state, and the modern state. 2:30 WMF. Mr. Gaus.

II. AMERICAN GOVERNMENT

7. American Government and Politics (National). I, II; 3 cr. Not open to freshmen. A critical analysis of the chief problems of American national politics. Special emphasis given affairs of current importance. Lectures 9 TT; one quiz. Mr. Kirk and staff.

13. Municipal Government. I; 2 cr. Prerequisite: Sophomore standing. The organization and politics of city governments, including the city as a political unit, home rule, the mayor, the city council, commission and city manager forms of government, and municipal politics. 8 TT. Mr. Salter.

112. Constitutional Law. I; 3 cr. Prerequisite: Political Science 1, 2, or 7. The federal constitution as interpreted by the courts in actual controversies involving various sections and clauses. 10 MWF. Mr. Pfankuchen.

114. Practical Problems of Municipal Government. I; 3 cr. Prerequisite: Political Science 1, 7, or 13, or consent of instructor. 8 MWF.

115. Social Problems of Municipal Government. II; 3 cr. Prerequisites: Junior standing and Political Science 1, 7 or 13, or consent of instructor. 9 MWF.

122. Political Parties and Party Problems. I, II; 3 cr. Prerequisite: Sophomore standing. The principal problems of politics and political parties, including party machines, the spoils system, nominating methods, political campaigning, expenditures, the conduct of elections, and participation in politics. 11 MWF. Mr. Salter.

123. American Diplomacy: Organization and Practice. I; 2 cr. Prerequisite: Political Science 7. State Department; foreign service, diplomatic and consular; treaty-making power; principles of foreign policy. Lectures, reading, discussions. Consultation regarding entrance to the foreign service. 9 TT.

126. PRINCIPLES OF LEGISLATION. II; 3 cr. Prerequisite: Political Science 1 or 7. The functions, organization, and procedure of legislative bodies; analysis of the problems and principles of lawmaking. Offered 1932-33 and in alternate years. Mr. Pfankuchen.

134. COUNTY AND TOWNSHIP GOVERNMENT IN THE UNITED STATES. I; 2 cr. Prerequisite: Sophomore standing. Emphasis upon the rural local institutions of the states of the Middle West.

135. MUNICIPAL ADMINISTRATION. II; 3 cr. Prerequisite: Political Science 1, 7, or 13, or senior standing. A survey of the work of city government: city planning, zoning, engineering problems, crime and police administration, parks and playgrounds, health, housing, poor relief, transportation, etc. 9 MWF. Mr. Salter.

139. GOVERNMENT OF WISCONSIN. I; 2 or 3 cr. Prerequisite: Political Science 1 or 7. The administrative activities of the state of Wisconsin; frequent comparisons with the governments of other states. 9 TT.

144. THE POLICE POWER AND SOCIAL LEGISLATION. II; 3 cr. Prerequisite: Political Science 112 with grade of B or above, or consent of instructor. Constitutional aspects of legislation the aim of which is to promote health, safety, morals, and the general social welfare. 4-5:30 TT. Mr. Pfankuchen.

248. SEMINARY IN POLITICAL PARTIES. II; 2 cr. Prerequisite: Graduate standing or consent of instructor. Traits and techniques of outstanding party leaders. 3:30-5:30 Th. Mr. Salter.

261. SEMINARY IN LEGISLATION AND CONSTITUTIONAL LAW. II; 2 cr. Not offered 1932-33.

III. FOREIGN AND COMPARATIVE GOVERNMENT

124. FEDERALISM IN THE BRITISH DOMINIONS. II; 2 or 3 cr. Prerequisite: Political Science 1, 7, 127, or 128, or consent of instructor. A functional study of selected problems in the working of dominion federalism. Not offered 1932-33. Mr. Sharp.

127. COMPARATIVE GOVERNMENT: ENGLAND. I; 3 cr. Prerequisite: Junior standing. Chiefly the English constitutional and governmental system, compared with other systems, but also some study of political parties and party phenomena. Not offered 1932-33. Mr. Sharp.

128. COMPARATIVE GOVERNMENT: CONTINENTAL EUROPE. II; 3 cr. Prerequisite: Junior standing. Similar in type of content to 127, but dealing mainly with the French, German, Swiss, and other Continental political systems. Not offered 1932-33. Mr. Sharp.

129. COMPARATIVE GOVERNMENT: EUROPE. I; 3 cr. Prerequisite: Junior standing. England and the Continent. 11 TT and third hour. Mr. Sharp.

143. INTRODUCTION TO PUBLIC ADMINISTRATION. I; 3 cr. Prerequisite: Political Science 1 or 7. The organization, management, and control of public administration, and the nature of public administration in the modern state. 11 TT, 9 S. Mr. Gaus.

250. Advanced Comparative Government. Yr; 3 cr. Courses 127, 128, and 129 are designed primarily for undergraduates; graduate students are expected ordinarily to take course 250. Emphasis in the first semester on the governments of England and the United States compared; in the second, on the governments of Continental Europe, especially of France and Germany. 10 MWF. Mr. Ogg.

258. Seminary in Administration. I; 2 cr. Prerequisite: Graduate standing or consent of instructor. 2:30-4:30 Tu. Mr. Gaus.

IV. INTERNATIONAL ORGANIZATION AND RELATIONS

118. Principles of International Law. I; 3 cr. Prerequisite: Sophomore standing. Introductory survey of principles and rules of law of peace and war. Text and case reading, class discussion, hypothetical cases. 1:30 MWF. Mr. Pfankuchen.

121. Dependencies and Their International Status. II; 2 cr. Prerequisite: Political Science 125 or 137 or consent of instructor. Types of colonies, American dependencies, British dominions, mandates. 9 TT.

125. General Survey of World Politics. I, II; 3 cr. Prerequisite: Sophomore standing. An analytical introduction to the foundation of international relations: nationalism; imperialism; racial, populational, and economic factors; war; the settlement of international disputes by methods other than war; recent and contemporary problems. Lectures and discussions. 1:30 MWF. Mr. Kirk.

131. The United States and Latin America. I, II; 3 cr. Prerequisite: Sophomore standing. Diplomatic and economic relations of the United States with the Latin American states, and their bearings upon world politics. 10 MWF. Mr. Lloyd Jones.

132. Africa in World Politics. I; 2 cr. Prerequisite: Sophomore standing. The partition of Africa and the resultant international interests and policies. 10 TT. Mr. Kirk.

133. The Near and Middle East in World Politics. II; 2 cr. Prerequisite: Sophomore standing. Problems of the Near and Middle East (including India) since the World War. 10 TT. Mr. Kirk.

137. International Organization and the League of Nations. I; 3 cr. Prerequisite: Sophomore standing. Diplomacy, treaties, arbitration, international bureaus, conferences, and international federation; the League of Nations. Lectures, reading, discussions. 11 MWF. Mr. Sharp

140. Far Eastern Politics. I; 3 cr. Prerequisite: Sophomore standing. A survey of international relations and governmental development in the Far East from the opening of active contact with Western states and peoples. 11 MWF. Mr. Ogg.

141. Far Eastern Politics: Recent and Contemporary. II; 2 cr. Prerequisites: Sophomore standing and Political Science 140 or consent of instructor. International, governmental, and economic problems and developments; the United States and Pacific Asia; the Philippines. Not offered 1932-33. Mr. Ogg.

251. Seminary in Latin America. Yr; 2 cr. Prerequisite: Graduate standing. 3:30-5:30 M. Mr. Lloyd Jones.

255. Seminary in World Politics. Yr; 2 cr. Deals principally with topics relating to Pacific Asia. Either semester's work may be taken separately; and, normally, graduate students should enroll in this course rather than in course 140 or 141. 3:30-5:30 Tu. Mr. Ogg.

259. Seminary in International Law. II; 2 cr. 3:30-5:30 M.

260. Seminary in International Organization and the League of Nations. II; 2 cr. 3:30-5:30 W.

V. MISCELLANEOUS

100. Senior Thesis. Yr; 2 cr. Staff.

180. Special Work. I, II; 2 or 3 cr. This course is intended primarily for upper-group undergraduates, but may be taken by graduates. The work is carried on individually, under the direction of some member of the staff.

275. Bibliography and Methodology of Political Science. Yr; 1 cr. Prerequisite: Graduate standing. Required of all students who are candidates for the doctor's degree. 2:30 Th. Mr. Ogg.

PSYCHOLOGY

V. Allen Charles Henmon, Ph.D., *Professor of Psychology, Chairman*
Hulsey Cason, Ph.D., *Professor of Psychology*
Frank Chapman Sharp, Ph.D., *Professor of Philosophy*
Kimball Young, Ph.D., *Professor of Social Psychology*
Richard Wellington Husband, Ph.D., *Assistant Professor of Psychology*
Harry Frederick Harlow, Ph.D., *Assistant Professor of Psychology*
Samuel Andrew Stouffer, Ph.D., *Assistant Professor of Social Statistics*
Theodore L. Torgerson, Ph.D., *Assistant Professor of Education*

Major. A minimum of 24 credits, including courses 103, 104, and a thesis. None of the courses in this department is open to freshmen. Psychology 1 is prerequisite to all other courses in psychology.

1. Introduction to Psychology. I, II; 3 cr. A first course in psychology, including a study of stimulus and response, the nervous system, sensation, reflexes, native reaction patterns, integration of action units, motivation, attention, learning and retention, perception, thinking, and intelligence. Lectures, demonstrations, and discussion sections. Lecture 9 MW; quiz. Mr. Cason and staff.

50. Applied Psychology. II; 2 cr. Vocational guidance and choice; personnel; salesmanship; advertising; applications of psychology to law, medicine. 11 TT. Mr. Husband.

100. Senior Thesis. Yr; 2 cr. Staff.

103. Experimental Psychology. I; 3 cr. Lectures on experimental methods on such topics as sensation, perception, motor recreations and coordinations, and other simple processes. Laboratory experiments on typical problems on the same topics. 9 TT and lab. Mr. Husband.

104. EXPERIMENTAL PSYCHOLOGY. II; 3 cr. Treats of more complex processes than 103; learning, memory, thinking, personality, intelligence. 9 TT and lab. Mr. Husband.

107. ABNORMAL PSYCHOLOGY. I; 3 cr. A descriptive and explanatory study of disorders of sensation, perception, association, memory, and emotion; mental deficiency; sleep and dreams; hypnosis; psychoneuroses; psychoses. 11 MWF. Mr. Cason.

108. PSYCHOLOGY OF EMOTIONS. I; 3 cr. Lectures on the primary motives, the feelings, and emotions. 9 MWF. Mr. Harlow.

111. PSYCHOLOGY OF THINKING. II; 3 cr. A study of the higher intellectual processes and their relation to action. Mr. Sharp.

127-128. MENTAL TESTS (Education 127-128). Yr; 3 cr. 1:30 MW. Mr. Torgerson.

139. SOCIAL PSYCHOLOGY (Sociology 139). I; 3 cr. Place of emotions, habits, fantastical and objective thinking in social behavior. Prerequisites: Psychology 1 and junior standing, or major in sociology. 10 MW, one quiz. Mr. Young and staff.

143. THE PSYCHOLOGY OF INDIVIDUAL DIFFERENCES AND THE MEASUREMENT OF INTELLIGENCE. II; 3 cr. A study of individual differences in mental traits and their significance, mental inheritance, the correlation of mental abilities, and the measurement of intelligence. 11 MWF. Mr. Henmon.

144. THE PSYCHOLOGY OF LEARNING. I; 3 cr. The original nature of man, economy in mental work and mental hygiene. 11 MWF. Mr. Henmon.

147. GENETIC AND CHILD PSYCHOLOGY. II; 3 cr. A study of psychological heredity, early influences of the biological environment, statistical studies of heredity, sex, and marriage, the human being at birth, principles of mental growth, native drives and learning mechanisms in the child. Text, lectures, and outside reading. 11 MWF. Mr. Cason.

149. ANIMAL BEHAVIOR. I; 3 cr. Elementary lectures on animal psychology. Maturation, motivation, and learning in animals, particularly mammals. Twelve credits of zoology may be substituted for Psychology 1 as a prerequisite for this course. 10 TT. Mr. Harlow.

150. ANIMAL BEHAVIOR. II; 3 cr. Lectures and discussions on animal psychology and its bearing on human psychology. Prerequisite: Consent of instructor. 10 TT. Mr. Harlow.

152. PROBLEMS IN ANIMAL BEHAVIOR. I, II; 1 to 3 cr. Individual experimental studies in animal behavior. Prerequisite: Psychology 149 or 150, or concurrent registration. Mr. Harlow.

154. PHYSIOLOGICAL PSYCHOLOGY. II; 3 cr. The physiological mechanisms determining human behavior. 10 MWF. Mr. Harlow.

161. MODERN VIEWPOINTS IN PSYCHOLOGY: BEHAVIORISM, GESTALT, AND PSYCHOANALYSIS. I; 3 cr. The theoretical and systematic backgrounds underlying these modern viewpoints in psychology. Historical foundations. 9 MWF. Mr. Husband.

180. INDEPENDENT READING. Yr; 1-3 cr. Prerequisite: Graduate major in psychology and consent of instructor. Staff.

197. PERSONALITY AND SOCIAL ADJUSTMENT. (Sociology 197) II; 3 cr. Personality treated from the angle of group participation. Prerequisite: Psychology 1 or Sociology 139 and junior standing. Lab. fee $1.50. 10 MW, one quiz. Mr. Young and staff.

200. RESEARCH. Yr; *cr. Staff.

201. SEMINARY. Yr; 1 cr. Required of all graduate majors in psychology. Mr. Henmon and staff.

203-204 ADVANCED EXPERIMENTAL PSYCHOLOGY. Yr; 2 cr. Lab. fee $2.00. Prerequisite: Psychology 103 and 104, or their equivalents. Mr. Cason.

210. SEMINARY, APTITUDE TESTING. Yr; 2 cr. Prerequisite: Consent of instructor. Mr. Henmon.

214. SEMINARY, APPLIED PSYCHOLOGY. I; 2 cr. Prerequisite: Consent of instructor. 7:30 p.m. W. Mr. Husband.

218. SEMINARY, LEARNING. Yr; 2 cr. Prerequisite: Consent of instructor. 3:30-5:30 Th. Mr. Cason.

225-226. TEST CONSTRUCTION (Education 225-226). Yr; 2-3 cr. Prerequisite: A course in educational statistics. 7-9 p.m. W. Mr. Torgerson.

233. STATISTICAL METHODS IN SOCIAL PSYCHOLOGY. I; 2 cr. Measurement of personality differences. Analysis of public opinion through statistics. Construction and validation of tests through social attitudes. Statistical problems in experimental behavior studies. Prerquisite: Sociology 132 and 139, or their equivalents. Lecture 11 W, 2 hours lab. and discussion. Mr. Stouffer.

239. ADVANCED SOCIAL PSYCHOLOGY. (Sociology 239) I; 2 cr. Various topics from year to year. 2:30-4:30 M. Fee $1.00. Mr. Young.

249. SEMINARY, ANIMAL PSYCHOLOGY. I, II; 1 cr. Prerequisite: Consent of instructor. 4-6 Tu. Mr. Harlow.

254. SEMINARY, PHYSIOLOGICAL PROBLEMS AND BEHAVIOR. II; 2 cr. Prerequisite: Consent of instructors. 7:30 p.m. W. Offered 1932-33 and in alternate years. Mr. Husband, Mr. Harlow.

261. SEMINARY, ADVANCED SYSTEMATIC PSYCHOLOGY. II; 2 cr. Prerequisite: Consent of instructors. 7:30 p.m. W. Offered 1933-34 and in alternate years. Mr. Husband, Mr. Harlow.

297. PERSONALITY PROBLEMS. (Sociology 297) II; 2 cr. Selected topics from year to year dealing with development of personality in reference to social cultural environment. Prerequisites: Graduate standing and consent of instructor. Fee $1.00. 2:30-4:30 M. Mr. Young.

SCANDINAVIAN LANGUAGES AND LITERATURE

EINAR HAUGEN, Ph.D., *Assistant Professor of Scandinavian Languages*

1a. FIRST-SEMESTER NORWEGIAN. I; 4 cr. Open to freshmen. Pronunciation, grammar drill, written and oral exercises, idioms. The aim is to lay a thorough grammatical foundation and to begin reading as quickly as possible. 10 MTWF. Mr. Haugen.

1b. SECOND-SEMESTER NORWEGIAN. II; 4 cr. Reading of easy selections; spoken and written practice in use of language. Occasional talks on Norway, its people, literature, history. 10 MTWF. Mr. Haugen.

2a. THIRD-SEMESTER NORWEGIAN. I; 3 or 4 cr. Reading in selected works of Ibsen and Bjørnson; folk-tales; suggestion of literary trends, especially in first half of the nineteenth century. Additional credit earned by extra reading. 11 MWF. Mr. Haugen.

2b. FOURTH-SEMESTER NORWEGIAN. II; 3 or 4 cr. Continuation of third semester. Some attention is paid to the history and literature of Norwegians in the United States, especially the work of O. E. Rölvaag. Occasional introduction of Swedish and Danish material to illustrate kinship of the Scandinavian tongues. 11 MWF. Mr. Haugen.

4. THIRD-YEAR NORWEGIAN. Yr; 3 cr. Literary history, novels and dramas. Readings in the masterpieces of the classical period: Bjørnson, Ibsen (*Peer Gynt*), Lie, Kielland. Assignments in political and literary history of the times. Writing of a topic. Prerequisite: Scandinavian 2. Not offered 1932-33. Mr. Haugen.

77. MODERN NORWEGIAN LITERATURE. I; 3 cr. Lectures and readings in English. The eighteenth century (Ludvig Holberg, the "Molière of the North"); the national renascence of the early nineteenth century (Wergeland, Welhaven); romanticism; the classic age of Ibsen and Bjørnson; the democratic victory, realism and naturalism, 1870-1890; neo-romanticism; the newer psychology. Students with two years of Norwegian may elect this as a language course with readings in the original. Prerequisite: Junior standing. 8 MWF. Mr. Haugen.

78. IBSEN'S SOCIAL AND PSYCHOLOGICAL DRAMAS. II; 3 cr. Lectures and readings in English. Ibsen's later plays, significance in world literature. Prerequisite: Junior standing. 8 MWF. Mr. Haugen.

108. OLD NORSE. Yr; 2 cr. Not offered 1932-33. Mr. Leonard.

153. SCANDINAVIAN MYTHOLOGY AND FOLK-LORE. I; 3 cr. Given in English. Survey of religious concepts of the Old Norsemen, origins and development. Relation of mythology to folk-lore; significance for comparative literature and study of popular psychology. Various forms of medieval and modern folk-literature: ballad, fairy-tale, legend, riddle. Romantic discovery of the folk in early nineteenth century; the Scandinavian school of folk-lore. Prerequisite: Junior standing. Offered 1933-34. Mr. Haugen.

154. THE MODERN SCANDINAVIAN NOVEL. II; 3 cr. Rapid reading course in English translation, devoted especially to writers of the twentieth century: Knut Hamsun, Hans Kinck, Sigrid Undset, Selma Lagerlöf, Martin Andersen Nexö, etc. Prerequisite: Junior standing. Offered 1933-34. Mr. Haugen.

SOCIOLOGY AND ANTHROPOLOGY

EDWARD ALSWORTH ROSS, Ph. D., LL.D., *Professor of Sociology, Chairman*
JOHN LEWIS GILLIN, Ph.D., LL.D., *Professor of Sociology* (on leave I)
JOHN HARRISON KOLB, Ph.D., *Professor of Rural Sociology*
RALPH LINTON, Ph.D., *Professor of Social Anthropology*
KIMBALL YOUNG, Ph.D., *Professor of Social Psychology*
ELLIS KIRKPATRICK, Ph. D., *Associate Professor of Rural Sociology*
HELEN ISABEL CLARKE, M.A., *Assistant Professor of Sociology*
CHARLOTTE DAY GOWER, Ph.D., *Assistant Professor of Physical Anthropology.*
SAMUEL ANDREW STOUFFER, Ph.D., *Assistant Professor of Social Statistics*
AUBREY WILLIS WILLIAMS, M.A., *Lecturer in Social Work.*
ELIZABETH YERXA, B.A., *Lecturer in Social Work.*

MAJOR. For *sociology* as a field of concentration thirty credits in sociology are required, including courses 132 and 140 and one course in anthropology. Not less than twenty additional credits must be offered within the Division of the Social Sciences, ten of which may be in this department.

For *anthropology* as a field of concentration thirty credits are also required, including one course in zoology and two three-credit courses in sociology in addition to Sociology 46, 106, 110, 132, and 142. Not less than twenty additional credits selected in conference with the adviser must be offered within the Division of the Social Sciences, or in Geography, Geology, Psychology, and Zoology, ten of which may be in this department.

To be eligible for graduation, students are required to earn as many grade-points as credits in the major. Certain upper-group students may substitute a thesis for four of the above required credits. This thesis may be written in any one of the fields designated in Groups I-VI as described on subsequent pages. Students not writing a thesis must offer three courses in some one of the designated fields.

SOCIAL WORK

PROFESSOR J. L. GILLIN IN CHARGE

The demand for trained workers in the different fields of social service is greater than can be supplied. The fields include family and child welfare, juvenile protection and probation, mothers' pensions, medical and psychiatric social work, and the work of school attendance officers, community chest executives, and visiting teachers. To help supply this need, the Department of Sociology and Anthropology has coordinated the courses offered in the University which provide background training for social work, thereby giving students who desire a liberal education the fundamental and technical training which will hasten their preparation for work in these fields. Some of these courses supply that broad liberal background necessary to an understanding of society, past and present, while others provide technical training in the adjustment of personality to social conditions on the one hand, and of social conditions to personality on the other. Proficient students are recommended directly to social agencies. Close affiliations are maintained with the Milwaukee School of Social Work, where the student is placed on a fellowship while finishing the training.

At the present time arrangements are made for the student who is looking forward to social work to prepare himself for two different kinds of work, —(1) family case work, and (2) group work. For the first type he does 300 hours of field work in the Madison Public Welfare Association; for the second, he does the same amount of field work with the Neighborhood House, the Y.W.C.A., Y.M.C.A., the Boy Scouts, the Girl Scouts or some other agency with which proper arrangements have been made and which deals with group activities. In both cases the field work is supervised by the University. Only a limited number of students can be admitted to these classes.

CERTIFICATE IN SOCIAL WORK

A certificate in social work is given to graduates of the University of Wisconsin who attain proficiency during two years of supervised field work in social agencies approved by this department, and who successfully pass an examination on the theory and technique of social work.

MASTER OF SCIENCE IN SOCIAL WORK

The degree of Master of Science in Social Work is granted to graduate students upon fulfillment of the following conditions:

1. Undergraduate preparation equivalent to that required for a major in sociology at the University of Wisconsin.
2. Twenty-one months of supervised professional training in approved Milwaukee, Madison, or other social agencies.
3. Two semester seminars in the major department.
4. Two semesters or equivalent summer sessions of full-time residence as a graduate student in the University of Wisconsin at Madison.
5. Thesis based on original research in some field related to social work.

During the last three years of the undergraduate work the following courses should be taken, preferably in the years suggested:

SOPHOMORE YEAR

First Semester	Credits	Second Semester	Credits
Econ. 1a—General economics	4	Econ. 1b—General economics	4
Soc. 1—Introductory sociology	3	Soc. 2—Introductory sociology	3
Soc. 46—Social anthropology	3	Psych. 1—Introductory psychology	3

JUNIOR YEAR

Soc. 141—Poverty and relief	3	Soc. 161—Criminology and penology	3
Soc. 139—Social psychology	3	Soc. 197—Personality and social adjustment	3
Psych. 107—Abnormal psychology	3	Soc. 132—Social statistics	3
Zool. 106—Heredity and eugenics	2	Home. Econ. 1b—General survey	2-3
Home Econ. 1a—General survey	2-3	Econ. 173—Economics of consumption	3
Home Econ. 47—Diet problems in feeding children	3		

SENIOR YEAR

Soc. 147—Introduction to social case work*	2	Soc. 140—Principles of sociology	3
Soc. 148—Introduction to group work*	2	Soc. 164—Principles of social case work*	2
Soc. 177—Social agencies and social legislation	2	Soc. 165—Principles of group work*	2
Soc. 25—Rural life	3	Soc. 178—Social organization and administration	2
Soc. 166—Principles of community organization	2	Soc. 162—Child welfare	2
Econ. 122—Labor problems	3	Phys. Ed. 80—Community recreation	2
		Pol. Sci. 115—Social problems of municipal government	3

*Which of these two should be taken depends upon the field for which the student is preparing.

The second year of training is provided by the Milwaukee School of Social Work located at 797 North Van Buren Street, Milwaukee, and closely affiliated with the University. The training offered there is two full days per week of lectures and three and a half days of carefully planned and supervised field work in approved agencies. The following courses are offered there:

1. Agency Practice. Yr.
2. Child Welfare. Yr.
3. Community Organization. Sem.
4. Community Resources. Sem.
5. Current Social Work Literature. Sem.
6. Essentials of Medicine for Social Workers. Sem.
7. Ethics of Social Work. Half Sem.
8. Fields of Social Work. Sem.
9. Mental Hygiene. Sem.
10. Social Case Work. Yr.
11. Social Problems of Industry. Sem.
12. Social Psychiatry. Sem.
13. Social Work Publicity. Sem.
14. The State in Relation to Social Work. Sem.

COURSES OF INSTRUCTION

I. SOCIOLOGICAL THEORY

1. Introductory Sociology. I; 3 cr. The community; processes and products of interaction; society and the person; social change. Prerequisite: Full sophomore standing. 8 MW; one quiz. Mr. Ross and staff.

2. Introductory Sociology. II; 3 cr. Population, crime, disease, marriage and divorce, women and children in industry, immigration, poverty, insanity, etc., as they reveal underlying social maladjustments. Prerequisite: For sociology majors, Sociology 1; for others, full sophomore standing. 8 MW; one quiz. Mr. Gillin and staff.

100. Senior Thesis. Yr; 2 cr. Staff.

139. Social Psychology. I; 3 cr. Place of emotions, habits, fantastical and objective thinking in social behavior, particularly as seen in prejudice, leadership, fashion, crowd behavior, mental epidemics, audiences, public opinion, propaganda, and censorship. Prerequisites: Psychology 1 and junior standing, or major in sociology. 10 MW, one quiz. Mr. Young and staff.

140. Principles of Sociology. II; 3 cr. Growth and shifting of population; genesis and life history of groups; social processes and products; ultimate tests of social policies. Prerequisites: For sociology majors, Sociology 1 and 2, or 46; for others, senior standing or consent of instructor. 9, 10 or 11 MWF. Mr. Ross.

163. Population Problems. I; 2 cr. Population pressure, conquest of disease, fall in the birth rate, growth of numbers, prospects of the food supply, control of immigration. Prerequisite: Senior standing or consent of instructor. Offered 1932-33 and in alternate years. 11 WF. Mr. Ross.

167. Contemporary Social Movements. I; 2 cr. Utopias, socialism, communism, fascism, the cooperative movement, the British labor movement, the peace movement. Prerequisite: Senior standing or consent of instructor. Offered 1931-32 and in alternate years. Mr. Ross.

172. Immigration and Race Problems. (Economics 172). II; 3 cr. Migrations of mankind in modern times. Particular attention to American immigration. Governmental immigration policies; economic, social, and political immigration problems: race problems. Prerequisites: Econ 1a, or American history and junior standing. 9 TT; quiz. Mr. Lescohier.

180. Independent Reading in Sociology or Anthropology. Yr; *cr. Reading may be in any field for which student has an adequate background. Prerequisite: Candidacy for degree with honors in major. Staff.

197. Personality and Social Adjustment. (See Group III.)

239. Advanced Social Psychology. I; 2 cr. Various topics from year to year: (1) public opinion and social control; (2) language and culture, with particular reference to the types of thought and the relationship of language to thinking and to the nature of culture; (3) psychology of leadership. 2:30-4:30 M. Fee $1.00. Mr. Young.

255. Seminary, Group Conflict. I; 2 cr. Causes, phases, and results of conflict between racial, natural, religious, political, and social groups in society; means of avoiding or allaying inter-group antagonisms. Fee $1.00. 3:30-5:30 Tu. Mr. Ross.

257. Seminary, Social Institutions. II; 2 cr. Nature and function of social institutions. Critical examination of the evolutionary theory of institutions. One type of institution discussed as an example of institutional development from the historical-cultural and social-psychological angles. 7:15-9:15 Tu. Fee $ .50. Mr. Young.

262. Seminary, American Family. I; 2 cr. Changes in the cultural and institutional environment of the family and its reaction thereto. Not offered 1932-33. Mr. Ross.

263. Seminary, Social Mobility. I; 2 cr. Societies from the point of view of the mobility of families and individuals within the social framework. Comparative shares of inheritance and of social environment in determining individual destiny. Not offered 1932-33. Mr. Ross.

264. Research Seminary. II; 2 cr. Field of investigation for 1932-33: The conflict between Capitalism and Democracy in the advanced societies. Fee $1.50. 3:30-5:30 Tu. Mr. Ross.

270. Human Ecology. I; 2 cr. The distributive aspects of population, social and economic institutions, and various functional groups. Analysis of accommodations of different groups to one another in terms of spatial and temporal relations. Not offered 1932-33. Mr. Young.

276. History of Sociological Thought. II; 2 cr. Social thought from Plato to Comte presented briefly. Principal emphasis on theory of Comte, Spencer, Bagehot, Tarde, Gumplowicz, Ratzenhofer, Simmel, Ward, Durkheim, Weber, Giddings, Sumner, Cooley, Ross, and Thomas. The relation of social theory to political, social, and economic backgrounds is emphasized throughout. 7:15-9:15 M. Fee $2.00. Mr. Gillin.

280. Reading and Research in Sociology and Anthropology. Yr; *cr. Work suited to individual graduate students may be arranged. Prerequisite: Advanced graduate standing. Staff.

297. Personality Problems. II; 2 cr. Selected topics from year to year dealing with development of personality in reference to social-cultural environment. 2:30-4:30 M. Fee $1.00. Mr. Young.

II. SOCIAL ANTHROPOLOGY

46. Social Anthropology. I; 3 cr. The origin of man; living races; origin and development of civilizations, with special reference to our own. Prerequisite: Sophomore standing. 11 TT, one quiz. Mr. Linton and staff.

102. Peoples of Africa. I; 3 cr. Ancient and modern cultures of Africa, their origins and development. Prerequisite: Sociology 46 or consent of instructor. Not offered 1932-33. Mr. Linton.

104. Peoples of Europe and Asia. II; 3 cr. Modern cultures of Europe and Asia, their origins and development. Prerequisite: Sociology 46 or consent of instructor. 9 TWT. Mr. Linton.

105. North American Indian. I; 3 cr. Origins of the American Indian, development of his culture and descriptions of selected groups. Prerequisite: Sociology 46 or consent of instructor. 9 TT, 1:30 W. Mr. Linton.

106. Introduction to Ethnology. II; 3 cr. Development of various human institutions with their historic distribution throughout the world. Prerequisite: Sociology 46 or consent of instructor. 11 TT, one quiz. Mr. Linton.

107. Primitive Religion. I; 3 cr. A study of selected primitive religions from the functional standpoint. Prerequisite: Junior standing or consent of instructor. Lecture 9 MWF. Miss Gower.

108. Theories of Culture. II; 2 cr. Study of anthropological theories and methods. Prerequisites: Sociology 46 and 139 or consent of instructor. 9 MF. Miss Gower.

109. Peoples of Oceania. II; 3 cr. Historic cultures of Australia, Melanesia, and Polynesia, with their origins and interrelations. Prerequisite: Sociology 46 or consent of instructor. Not offered 1932-33. Mr. Linton.

110. Human Pre-History. II; 3 cr. Human evolution and races and cultures prior to the Neolithic period. Prerequisite: Sociology 46 or consent of instructor. 10 TT, one quiz. Miss Gower.

142. INTRODUCTION TO PHYSICAL ANTHROPOLOGY. I; 3 cr. Physical structure and racial types of mankind. Prerequisite: Zoology 1. 10 TT, one lab. Miss Gower.

143. ADVANCED PHYSICAL ANTHROPOLOGY. II; 1 cr. Training in laboratory methods with research on assigned problems. Prerequisite: Sociology 142 and consent of instructor. Miss Gower.

204. ANTHROPOLOGICAL PROBLEMS. Yr; 2 cr. Discussions of current anthropological literature and methods, and work on assigned problems. 7:15-9:15 Th. Prerequisite: Graduate standing or consent of instructor. Mr. Linton, Miss Gower.

211. THE INDIVIDUAL IN CULTURAL CHANGE. I; 2 cr. The significance of the rebel in relation to the culture pattern. 7:15-9:15 W. Miss Gower, Mr. Linton.

212. FUNDAMENTAL CONTRASTS BETWEEN ORIENTAL AND OCCIDENTAL CULTURES. II; 2 cr. 7:15-9:15 W. Prerequisite: Graduate standing or consent of instructor. Miss Gower, Mr. Linton.

III. SOCIAL PATHOLOGY

141. POVERTY AND DEPENDENCY. I; 3 cr. Extent of poverty and pauperism; causes of poverty and dependency; historical institutions and methods of dealing with dependents; special classes of dependents like the aged, the insane, epileptic, dependent children; preventive agencies and methods. Prerequisites: For sociology majors, Sociology 1 and 2 or concurrent registration in 1; for others, junior standing or concurrent registration in 1. Not offered 1932-33. Mr. Gillin.

158. DEGENERACY AND SOCIETY. I; 2 cr. The various forms of degeneracy, with special emphasis upon mental and social degeneracy; the relationship of mental and physical degeneracy to such social problems as crime, pauperism, divorce, religion, industry, rural and city life, war, vice. Prerequisite: Sociology 141 or 161 or senior standing. Not offered 1932-33. Fee $2.00. Mr. Gillin.

161. CRIMINOLOGY AND PENOLOGY. II; 3 cr. The problem of crime and criminals; extent and cost of crime; the making of the criminal; the history of punishment; modern penal institutions; the machinery of justice. Prerequisites: For sociology majors, Sociology 1 and 2 or concurrent registration in 2; for others, junior standing or concurrent registration in 2. 11 MW, one quiz. Mr. Gillin.

197. PERSONALITY AND SOCIAL ADJUSTMENT. II; 3 cr. Personality treated from the angle of group participation, especially in the family, play group, gang, neighborhood, school, church, and various community groups. Literature on problem children, juvenile delinquency, and adolescence examined critically. Prerequisites: Psychology 1 or Sociology 139, and junior standing. Fee $1.50. 10 MW, one quiz. Mr. Young and staff.

256. Development of Correctional Policies. II; 2 cr. Theories and policies relating to the criminal and his treatment; the evolution of punishment; the relation of canon law to secular criminal law; the classical theory of punishment; the Italian School; modern theories and policies. Prerequisite: Graduate standing or consent of instructor. Fee $2.00. Not offered 1932-33. Mr. Gillin.

259. Development of Poor Relief Policies. II; 2 cr. The development of poor relief theories and policies from ancient times to the present. Not offered 1932-33. Fee $2.00. Mr. Gillin.

IV. SOCIAL WORK

147. Introduction to Social Case Work. I; 2 cr. with 150 hours of field work at local Public Welfare Association, or 1 cr. without field work. The use of the first interview and sources such as relatives, employers, schools. The methods of social diagnosis. Prerequisites: For sociology majors, Sociology 177 or concurrent registration, senior or graduate standing and consent of instructor; For others, senior standing and consent of instructor. Students have the option of taking Sociology 147 or 148, but may not take both within their major. 1:30 Tu. Miss Clarke.

148. Introduction to Group Work. I; 2 cr. with 150 hours of field work at Neighborhood House, Y.W.C.A., Boy Scouts, etc., or 1 cr. without field work. The importance of the group. The meaning and methods of socialization. Legal and social questions as they affect the foreigner. Prerequisites: For sociology majors, Sociology 177 or concurrent registration, senior or graduate standing and consent of instructor; For others, senior standing and consent of instructor. Students have the option of taking Sociology 147 or 148, but may not take both courses within their major. 1:30 Th. Miss Clarke.

162. Child Welfare. II; 2 cr. Proportion of children in the population; the dependent, delinquent, defective child,—his problems and the community's methods of treatment. Prerequisites: Senior standing and consent of instructor. 1:30-3:30 M. Miss Yerxa.

164. Principles of Social Case Work. II; 2 cr. with 150 hours of field work at local Public Welfare Association, or 1 cr. without field work. Case-work treatment of executive and leadership types. The social workers' principles of interviewing. Types of treatment given the unmarried mother, deserted family, transient men, etc. Prerequisite: Sociology 147 or consent of instructor. Students have the option of taking Sociology 164 or 165, but may not take both courses within their major. 1:30 Tu. Miss Clarke.

165. Principles of Group Work. II; 2 cr. with 150 hours of field work at Neighborhood House, Y.W.C.A., Y.M.C.A., Boy Scouts, etc., or 1 cr. without field work. Discussion of group movements, such as the settlement, the school community center, the open forum, boy and girl scouts. Methods and organization of agencies working with groups. Prerequisite: Sociology 148 or consent of instructor. Students have option of taking Sociology 164 or 165, but may not take both courses within Fee $2.00. 2:30 TT. Miss Clarke.

166. PRINCIPLES OF COMMUNITY ORGANIZATION. I; 2 cr. Historical development of community organization; principles of organization in social welfare agencies, and relation of such agencies to the sociological structure; forms of organization for different purposes; relation of organized public and private agencies; local, state-wide, and national organizations; the social philosophy and function of social organization. Prerequisite: Senior standing and consent of instructor. 1:30-3:30 M. Mr. Williams.

177. SOCIAL AGENCIES AND SOCIAL LEGISLATION. I; 2 cr. Conception and types of social work. Statutes and court decisions as they affect the social worker. Prerequisite: Sociology 141 or consent of instructor. Fee $2.00. 2:30 TT. Miss Clarke.

178. SOCIAL ORGANIZATION AND ADMINISTRATION. II; 2 cr. Typical experiments in community organization such as the public health and settlement movements, the federation of social agencies, etc. Theories and principles of community organization. Prerequisite: Sociology 177 or consent of instructor. 2:30 TT. Miss Clarke.

V. RURAL SOCIOLOGY

25. RURAL LIFE. I; 3 cr. The rural life movement with special attention to group organization and rural social institutions, such as family, school, church, social welfare agencies; principles and policies of rural community organization. Prerequisite: Sophomore standing. 10 MWF. Mr. Kolb.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Development of standards of living in rural communities. Consideration of all elements composing the standard of living: food, housing, transportation, education, religion, art, and recreation, in relation to income, trading centers, social institutions and local groupings. Prerequisite: Junior standing. 7:15-9:15 W. Mr. Kirkpatrick.

200. RESEARCH. Yr; *cr. Rural social organization and rural life, Mr. Kolb; Rural standards of living, Mr. Kirkpatrick.

225. SEMINARY IN RURAL SOCIAL ORGANIZATION. I; 2 cr. Emphasis upon research methodology. Case studies of current projects in rural social research. Particular attention to group organization, population, and institutional relations in rural society. Prerequisite: Sociology 25 or equivalent. 7:30-9:30 Tu. Mr. Kolb.

VI. STATISTICS

132. INTRODUCTORY SOCIAL STATISTICS. I, II; 3 cr. Introduction to the logic and use of statistics as a method of analyzing social data. Training in statistical handling of data which the student has gathered himself. Types of statistical fallacies; measures of central tendency and variability; analysis of vital statistics; index numbers; time series and simple curve fitting; linear correlation of two variables; sampling, with major emphasis on problems of making the sample representative. Prerequisite: Major in sociology or consent of the instructor. Lecture 10 Tu; laboratory and discussion 3:30-5:30 TT. Lab. fee $1.50. Mr. Stouffer.

232. Advanced Social Statistics. Yr; 2 cr. Theory of errors, with special attention to methods of determining the representativeness and reliability of small samples; relationship between non-quantitative categories; curve fitting; seasonal and cyclical fluctuations; correlation of time series; special problems in total linear and non-linear correlation; partial and multiple correlation. Material drawn from problems of practical concern to research workers in sociology and related fields. Prerequisites: Graduate standing and Sociology 132. Lab. fee $1.00. Lectures 11 F., 1:30 F; lab. 2:30 F. Mr. Stouffer.

233. Statistical Methods in Social Psychology. I; 2 cr. Approaches to the measurement of personality differences. Analysis of public opinion through relationships between votes and various social factors. Methods of constructing and validating tests of social attitudes. Statistical problems in experimental behavior studies. Prerequisites: Sociology 132 and 139. Lecture 11 Th; lab. 1:30-3:30 Th. Fee $1.50. Mr. Stouffer.

234. Statistics in Population Research. II; 2 cr. Critical examination of chief sources of data and consideration of typical fallacies of interpretation. Refinement of birth rates and death rates. Prediction of population growth. Techniques for studying selected topics, such as differential fertility; population and natural resources; population phenomena in relation to business cycles. Prerequisites: Sociology 132 and preferably 163. Lecture 11 W., 2 hours lab. and discussion. Fee $1.50. Mr. Stouffer.

SPANISH AND PORTUGUESE

Joaquín Ortega, M.A., *Professor of Spanish, Chairman*
Antonio García Solalinde, Litt.D., *Professor of Spanish and Portuguese*
Hyman Chonon Berkowitz, Ph.D., *Associate Professor of Spanish*
Charles Dean Cool, Ph.D., *Associate Professor of Spanish*
James Homer Herriott, Ph.D., *Assistant Professor of Spanish*
Albert Eddy Lyon, Ph.D., *Assistant Professor of Spanish*

INSTRUCTORS

Alden R. Hefler, M.A. — Eduardo Neale-Silva, M.A.
Lloyd August Kasten, Ph.D. — Mack Singleton, M.A.
Kathrin Marie Tufts, M.A.

Nature of the Courses. The elementary courses have been planned to meet the needs of students who take up the language for the first time at the University of Wisconsin, as well as of those who have begun the study in high school, or who may transfer from other higher institutions. For purposes of meeting the prerequisites of the courses announced, one unit (year) of high-school work is assumed to be the equivalent of 4 credits, or one semester of college work. The regular first-year courses are 1a and 1b. The regular second-year courses are 10a and 10b, in which emphasis is placed on the acquisition of a reading knowledge of the language. The second-year practice courses are 15 and 20, usually taught by Spanish-speaking instructors and intended to supplement the training offered in 10a and 10b. The regular third-year course is 21, comprising reading of representative master-pieces with a background of literary history and designed to be an introduction to the study of Spanish literature. This course is a prerequisite

to all the other courses in Spanish literature. Students who do excellent work in 10a are urged to enter 21, omitting 10b, thus reducing by one semester the period of preparation for the more advanced courses. 25 is a third-year practice course, usually taught by Spanish-speaking instructors and intended to supplement the training offered in 21; it may be taken separately. 27 is a special third-year course designed to meet the needs of students in such technical fields as commerce, engineering, and agriculture. 17 and 18 are special third-year courses intended to be introductory to the study of Spanish and Spanish-American civilizations. Spanish 55 (Comp. Lit. 55) is a course offering an approach to Spanish and Portuguese literature to students without the knowledge of the languages. A course in elementary Portuguese is offered, and more advanced work will be established when the demand arises. Portuguese is important in comparative study of the Romance languages, and of practical value as the language of Brazil, the largest republic in America outside of the United States.

The advanced practice courses are 116 and 190, for which the prerequisite is three years of college Spanish; 21 is not a necessary prerequisite. The advanced courses in literature and civilization have as a prerequisite 21, or equivalent; several are given in Spanish. Those under 200 are open to undergraduates. A careful rotation is established so that students specializing in literature may have adequate instruction in all genres and epochs.

The philological courses are intended for graduate students, but 141, an introductory course, is open to undergraduates. In special cases, undergraduates may be admitted to advanced philological work with the consent of Professor Solalinde.

All students who have had some Spanish before entering the University and who wish to continue the study of the language, are assigned to classes on the basis of their ratings in a placement test, as described in section 11, page 55. The foreign-language requirements for the B.A. degree are set forth in section 24, page 64.

Major. 32 credits, including thesis (or 4-6 credits in literature courses numbered above 100 for students not required to write a thesis). Majors who have had up to the senior year no grades below B in Spanish, and, in exceptional cases, majors who have had one or two grades of C in the elementary stage of the study of the language, will submit a thesis. Majors not falling in the above described groups may apply to the Chairman of the Department for permission to write a thesis. Beginning with the academic year 1933-34, students must take, before graduation, a comprehensive examination in the major field, covering conversation, composition, grammar, literature, and civilization; this procedure is optional for those to be graduated in 1932 or 1933. The Department has prepared a reading list of the most important standard works, for which students will be held responsible at the time of the examination, whether or not they have studied them in regular courses. For further information about this examination, application may be made to the departmental office.

All who intend to specialize in Spanish are advised to elect related courses in classical and modern languages and literatures, comparative literature, history, philosophy, and art history and criticism. Courses especially recommended are Introduction to phonetics (English 185), Principles and practice of translation (Comp. Lit. 141), and the courses included in the field of the Hispanic Studies.

TEACHING MAJOR AND MINOR. See School of Education.

HISPANIC STUDIES AS A FIELD OF CONCENTRATION. Students interested in this major field should consult page 58.

FOREIGN NEWS SERVICE. This branch of journalism, which emphasizes the Hispanic field, is discribed in the special bulletin of the School of Journalism.

SEMINARY IN SPANISH MEDIEVAL STUDIES. A well-equipped seminary for independent research in this field has been established under the direction of Professor Solalinde.

REVIEW CONFERENCE. The department has organized a monthly review conference at which members of the faculty and graduate students present and discuss reviews of the late important books in the Hispanic field.

SPANISH CLUB. The *Club Cervantes* meets every other week during the year and presents interesting programs. Each semester and summer session a Spanish play is staged, thus affording an opportunity to the students for participating in Spanish dramatics.

SPANISH

ELEMENTARY AND INTERMEDIATE LANGUAGE

1a. FIRST-SEMESTER SPANISH. I, II; 4 cr. For students who have had no Spanish. 17 sections I; 4 sections II. Mr. Berkowitz, Mr. Herriott, and staff.

1b. SECOND-SEMESTER SPANISH. I, II; 4 cr. Prerequisite: Spanish 1a or one year of high-school Spanish. 4 sections I; 12 sections II. Mr. Berkowitz, Mr. Herriott, and staff.

10a. THIRD-SEMESTER SPANISH. I, II; 3 cr. Prerequisite: Spanish 1b or two years of high-school Spanish. 8 sections I; 3 sections II. Mr. Berkowitz, Mr. Herriott, and staff.

10b. FOURTH-SEMESTER SPANISH. I, II; 3 cr. Prerequisite: Spanish 10a or three years of high-school Spanish. 2 sections I; 6 sections II. Mr. Berkowitz, Mr. Herriott, and staff.

15. ELEMENTARY CONVERSATION. Yr; 1 cr. Prerequisite: Spanish 1b or equivalent. May be taken only with Spanish 10a or 10b. 4 sections. Mr. Lyon and staff.

20. ELEMENTARY COMPOSITION, CONVERSATION, AND GRAMMAR REVIEW. Yr; 2 cr. Prerequisite: Spanish 1b or equivalent. Not open to students who have had 10b. 3 sections. Mr. Lyon and staff.

25. INTERMEDIATE COMPOSITION AND CONVERSATION. Yr; 2 cr. Prerequisite: Spanish 10b, or 20, or equivalent. Not open to students with three years of college Spanish. The regular third-year Spanish course, recommended to all students, is Spanish 21. For training in conversation and composition, L and S students with two years of college Spanish should enter Spanish 25, and with three years of college Spanish, Spanish 116. 3 sections. Sr. Ortega, Mr. Cool, Sr. Neale-Silva, Mr. Barr, Sr. Guevara.

27. SPANISH COMMERCIAL CORRESPONDENCE. Yr; 2 cr. Prerequisite: Spanish 10b or 20, or equivalent. Open only to students in technical courses. 9 TT. Mr. Cool.

ADVANCED PRACTICE COURSES

(Prerequisite: Three years of college Spanish)

116. COMPOSITION, CONVERSATION, AND GRAMMAR REVIEW. Yr; 2 cr. 11 TT. Sr. Ortega.

190. SPANISH PHONETICS. I; 2 cr. Theory of Spanish sounds with practical training in pronunciation. 2:30 TT. Sr. Solalinde.

TEACHING OF SPANISH. See School of Education.

PHILOLOGY

141. SPANISH HISTORICAL GRAMMAR. Yr; 2 cr. An introductory course to Spanish philology: Phonology, morphology, and syntax. Prerequisite: Three years of college Spanish. 3:30 MW. Mr. Herriott.

210. PHILOLOGICAL SEMINARY, OLD SPANISH. Yr; 2 cr. Conducted in Spanish. 1931-32: The language of Gonzalo de Berceo. 1932-33: The language of Alfonso el Sabio. 7:30-9:30 p.m. M. Sr. Solalinde.

273. COMPARATIVE PHILOLOGY OF CASTILIAN, CATALAN, AND PORTUGUESE. Yr; 2 cr. Conducted in Spanish. Offered 1933-34. Sr. Solalinde.

CIVILIZATION

17. SPAIN OF TODAY. I; 2 cr. A study of current periodicals, with supplementary readings and lectures to establish a background of the actual social, economic, and political conditions in Spain. Illustrated with lantern slides. Prerequisite: Spanish 10b. 10 TT. Sr. Ortega.

18. SPANISH AMERICA OF TODAY. II; 3 cr. A similar study of Spanish America Prerequisite: Spanish 10b. 10 TT. Sr. Neale-Silva.

150. SPANISH CIVILIZATION. I; 2 cr. Conducted in Spanish. Prerequisite: Spanish 21. Illustrated with lantern slides. Offered 1933-34 and in alternate years. Sr. Solalinde.

151. SPANISH-AMERICAN CIVILIZATION. I; 2 cr. Conducted in Spanish; illustrated with lantern slides. Prerequisite: Spanish 21. 10 TT. Sr. Neale-Silva.

INTERPRETING HISPANIC NEWS. See Journalism 121.

LITERATURE

(Spanish 21, or its equivalent in the case of students coming from outside institutions, is prerequisite to all 100 courses in Spanish literature.)

21. ELEMENTARY SURVEY. Yr; 3 cr. Introduction to the study of Spanish literature. Representative masterpieces in class, assigned readings, discussion of the literary aspects of the works read, and literary history. Prerequisite: Spanish 10b or equivalent. 4 sections. Mr. Cool (Chairman), Mr. Berkowitz, Mr. Herriott, Sr. Ortega.

55. SPANISH AND PORTUGUESE MASTERPIECES IN TRANSLATION. See Comparative Literature 55.

102. Spanish Contemporary Literature. Yr; 3 cr. Not offered 1932-33. Sr. Ortega.

103. Spanish Lyrical Poetry. I; 2 cr. Not offered 1932-33. Mr. Lyon.

104. Cervantes. Yr; 2 cr. Offered 1931-32 and in alternate years. 11 TT. Mr. Cool.

106. Spanish Drama of the Eighteenth and Nineteenth Centuries. Yr; 2 cr. Not offered 1932-33. Mr. Lyon.

108. Spanish Drama Before the Golden Age. Yr; 2 cr. Not offered 1932-33. Mr. Herriott.

111. The Spanish Picaresque Novel. Yr; 2 cr. Not offered 1932-33. Mr. Cool.

114. Spanish Drama of the Golden Age. Yr; 3 cr. 11 MWF. Sr. Ortega.

118. The Spanish Short Story. II; 2 cr. Not offered 1932-33. Mr. Lyon.

122. Spanish Novel of the Nineteenth Century. Yr; 3 cr. Offered 1932-33 and in alternate years. 9 MWF. Mr. Berkowitz.

126. Spanish-American Literature. Yr; 2 cr. Conducted mainly in Spanish. Not offered 1932-33. Sr. Neale-Silva.

131. General Survey of Spanish Literature. Yr; 3 cr. Conducted in Spanish. 1:30 MTT. Sr. Solalinde.

171. Spanish Epic Literature. Yr; 2 cr. Old Spanish epics and their later development. Conducted in Spanish. Offered 1931-32 and in alternate years. Sr. Solalinde.

200. Individual Research. Yr; credit commensurate with work accomplished. Well qualified graduate students may undertake individual research in some definite field. Sr. Solalinde.

201. Methods of Investigation and Bibliographical Information. Yr; 1 cr. Required of candidates for the doctorate who have not had this training elsewhere. Conducted in Spanish. Offered 1932-33 and in alternate years. 2:30 M. Sr. Solalinde.

205. Seminary, Eighteenth Century. Yr; 2 cr. Not offered 1932-33. Mr. Lyon.

209. Seminary, History of Literary Criticism in Spain. Yr; 2 cr. Not offered 1932-33. Mr. Berkowitz.

230. Seminary, Tirso de Molina. Yr; 2 cr. Not offered 1932-33. Sr. Ortega.

231. Seminary, Galdós. Yr; 2 cr. Not offered 1932-33. Mr. Berkowitz.

240. Seminary, Quevedo. Yr; 2 cr. 3:30-5:30 Th. Mr. Cool.

PORTUGUESE

1-2 Elementary Portuguese. Yr; 4 cr. For beginners. 1:30 MTWT. Mr. Singleton.

SPEECH

ANDREW THOMAS WEAVER, Ph.D., *Professor of Speech, Chairman*
ROBERT WEST, Ph.D., *Professor of Speech Pathology*
GERTRUDE ELIZABETH JOHNSON, B.A., *Associate Professor of Speech*
HENRY LEE EWBANK, Ph.D., *Associate Professor of Speech*
WILLIAM CHILTON TROUTMAN, M.A., *Associate Professor of Speech*
GLADYS LOUISE BORCHERS, Ph.D., *Assistant Professor of Speech*
GEORGE ADAMS KOPP, M.S., *Instructor in Speech*
JAMES RUSSELL LANE, B.S., *Instructor in Speech*

The courses in this department have two main functions: 1. the education of students in the fundamentals of speech (private and public), covering both scientific and artistic aspects,—organized knowledge and personal proficiency: 2 the preparation of especially qualified students to become teachers in one or more of the following sections of this field: (a) argumentation and debate, and the composition and delivery of public speeches; (b) reading, acting, and dramatic production; (c) disorders of speech and corrective methods; (d) the psychology and pedagogy of reading and speaking; (e) voice science and phonetics. The courses are so arranged as to make possible systematic and progressive study during the sophomore, junior, and senior years. Courses in speech are not open to freshmen.

MAJOR. A minimum of 30 credits in speech, including at least 12 credits in courses numbered above 100. Upper-group students who have done distinguished work in speech will be permitted to write theses.

THE UNIVERSITY THEATRE. This well-equipped little theatre provides unusual facilities for training students in acting and in producing plays. A number of plays are staged each semester under the direction of Mr. Troutman and staff.

SPEECH CLINIC. This clinic, which is free to all students, is open for fifteen to eighteen hours per week throughout the academic year; it offers expert guidance and assistance in the diagnosis and treatment of all kinds of voice and speech disorders. Mr. West and staff.

FORENSIC ACTIVITIES. The department sponsors and supervises an extensive program of intra-mural and intercollegiate debates and other speech contests which provide special training for students with unusual talent.

PUBLIC READINGS. Students especially proficient in reading are given the opportunity to appear on a regular weekly program of public readings.

1. FUNDAMENTALS OF SPEECH. I, II; 3 cr. The lecture hour is designed to give the student an understanding of the speech function. The recitation hours are devoted to practice before the class, the analysis of individual difficulties, and suggestions for improvement. Students who expect to take further work in speech should elect this course in their sophomore year if possible. Open to all students except freshmen. Lecture may be taken for one credit by students taking Speech 7. Lab. fee $1.00. Lect. 11 Th; two class periods. Mr. Ewbank and staff.

2. FUNDAMENTALS OF SPEECH. I, II; 3 cr. Continuation of Speech 1, which is prerequisite. 11 MWF. Mr. Ewbank, Mr. Weaver.

3. ARGUMENTATION AND DEBATE. I, II; 3 cr. A consideration of the problems involved in gathering material and constructing the type of composition which aims to persuade or to convince. The preparation and delivery of various types of argumentative speeches. Prerequisite: Speech 1, 7, or 8. 10 MWF. Mr. Ewbank.

4. ARGUMENTATION AND DEBATE. II; 3 cr. Continuation of Speech 3, which is prerequisite. Not offered 1932-33. Mr. Ewbank.

6. VOICE TRAINING. I; 2 cr. Specific training and practice designed to improve vocal conditions for all speech purposes. Exercises for flexibility, range, relief from tension, articulation, and enunciation. Text and outside readings. Prerequisite: Speech 1, which may be taken concurrently. 3:30 W, and quiz. Miss Johnson and staff.

7. PUBLIC SPEAKING. I, II; 2 cr. For those who wish to acquire some skill in public address. Maximum of platform work. Special emphasis upon purpose, audience, occasion, and types of speeches. Open to all students except freshmen and those who have had Speech 1. (Students taking Speech 7 may take the lecture in Speech 1 for one credit.) Seven sections: 8, 9, 10, 2:30 MW: 8, 9, 10 TT. Mr. Lane and staff.

8. EXTEMPORE SPEAKING. I, II; 2 cr. Open only to freshmen electrical engineers, of whom it is required. Mr. Kopp.

16. ELEMENTS OF DRAMATIC EXPRESSION AND ACTING. I, II; 2 cr. Prerequisites: Speech 1 and 6; the latter may be taken concurrently. 2:30 TT. Mr. Troutman.

18. ORAL INTERPRETATION OF LITERATURE. II; 2 cr. Prerequisite: Speech 6. 11, 2:30 MW. Miss Johnson.

19. ELEMENTARY DRAMATIC PRODUCTION. I, II; 2 cr. Students in this course are urged to take Speech 22. Prerequisite: Speech 16. 2:30 MW. Mr. Troutman.

22. DRAMATIC READING AND PLATFORM ART. Yr; 2 cr. Prerequisite: Speech 16 and 18; the former may be taken concurrently. 10 or 11 TT. Miss Johnson.

25. CORRECTION OF SPEECH DISORDERS. I; 3 cr. Prerequisite: Junior standing 1:30 MWF. Mr. West.

100. SENIOR THESIS. Yr; 2 cr. Staff.

105. SPEECH COMPOSITION. I; 3 cr. Prerequisite: Speech 2 or 3. 9 MWF. Mr. Ewbank.

110. FORMS OF PUBLIC ADDRESS. II; 2 cr. Prerequisite: Consent of instructor. 9 TT. Mr. Ewbank.

119. ADVANCED DRAMATIC PRODUCTION. Yr; 2 cr. Students are urged to take Speech 123 in connection with this course. Prerequisite: Speech 19 or consent of instructor. 1:30 TT. Mr. Troutman.

121. VOICE SCIENCE. I; 3 cr. Prerequisites: Speech 2 and upper-group status. 2:30-4:30 M, 2:30 W. Mr. Weaver.

123. Interpretation of Classic Literature. II; 2 cr. Prerequisite: Speech 22 or consent of instructor. 7:15-9:15 p.m. M. Miss Johnson.

125. Speech Pathology. I; 3 cr. Prerequisites: Speech 1 and 25. 11 MWF. Mr. West.

126. Advanced Correction of Speech Disorders. II; 3 cr. Prerequisites: Speech 1 and 25. 11 MWF. Mr. West.

135. Advanced Argumentation and Debate. II; 3 cr. Prerequisite: Speech 3 or graduate standing. 9 MWF. Mr. Ewbank.

140. Stage Design (Art Education 140). II; 2 cr. Prerequisite: Speech 19 or graduate standing in speech. 3:30 TT. Mr. Varnum.

141. Psychology of Speech. II; 3 cr. Prerequisites: Psychology 1, Speech 2. 10 MWF. Mr. Weaver.

185. Introduction to Phonetics. II; 3 cr. Prerequisite: Speech 2 or 25, or consent of instructor. 1:30 MWF. Mr. West, Miss Keck.

186. Advanced Phonetics. II; 3 cr. Not offered 1932-33. Mr. Hanley.

200. Research. Yr; 1-4 cr. Mr. Weaver.

205. Seminary, Rhetoric and Oratory. I; 2 cr. 3:30-5:30 W. Miss Borchers.

219. Seminary, Dramatic Production. II; 2 cr. 3:30-5:30 W. Mr. Troutman.

220. Seminary, Theory of Oral Interpretation. II; 2 cr. Not offered 1932-33. Miss Johnson.

227. Seminary, Speech Pathology. Yr; 2 cr. 7:30-9:30 p.m. Tu. Mr. West.

255. Seminary, Persuasion. II; 2 cr. 7-9 p.m. M. Mr. Ewbank.

TEACHERS' COURSE

Teaching of Speech. See School of Education.

ZOOLOGY

Michael Frederic Guyer, Ph.D., LL.D., *Professor of Zoology, Chairman*
Frederick Lee Hisaw, Ph.D., *Professor of Zoology*
Chancey Juday, M.A., *Professor of Limnology*
George Wagner, M.A., *Professor of Zoology*
William Stanley Marshall, Ph.D., *Associate Professor of Entomology*
Lowell Evan Noland, Ph.D., *Associate Professor of Zoology*
Chester Albern Herrick, Sc.D., *Assistant Professor of Zoology and Veterinary Science*
Pearl Elizabeth Claus, Ph.D., *Research Associate in Zoology*
Harry Leonard Fevold, Ph.D., *Research Associate in Zoology*
Nellie Mae Bilstad, M.A., *Instructor in Zoology*
Harold Reclus Wolfe, M.S., *Instructor in Zoology*

MAJOR. A minimum of 30 credits, which will customarily include the following courses: (A) in the case of students preparing for teaching or advanced work in zoology: Botany 1, Zoology 1, 102, 104, 105, and 9 or 126; (B) in the case of students preparing for medicine, nursing, or technician work: Zoology 1, 104, 105, 106, 111, and 119 or 102. Changes in the list of courses required for the major may be made only by arrangement with the adviser. Students with upper-group status, who have the invitation or consent of their major professor, are privileged to undertake original work in the thesis as a part of the minimum requirement.

For the advanced courses, training in chemistry and ability to read French and German are desirable. Medical students will find courses 104-106, 111, 118-120, and 122 of special interest. Agricultural students will find courses 9, 104, 106, 110-112, and 119 of special interest.

1. ANIMAL BIOLOGY. I, II; 5 cr. Cell structure, cell division, adaptations of animals, physiology of organ systems, embryology, heredity, and evolution. Laboratory includes anatomy, physiology, embryology, and histology of the frog, and comparative studies on Protozoa, Hydra, and honey-bee. This course combined with Botany 1 or Zoology 2 satisfies the science requirement for the bachelor's degree. Lab. fee $8.00. Lecture: I, 9 MW (Mr. Wagner); II, 2:30 MW (Mr. Guyer); 4 hrs. lab., one quiz. Mr. Guyer, Mr. Wagner, and staff.

2. GENERAL ZOOLOGY. II; 5 cr. A survey of the main types of animals, their classification, structure, life history, and interest to man. Laboratory work on representative animals. Bird trips. Prerequisite: Zoology 1. Lab. fee $8.00. Lecture 9 MW; 4 hrs. lab., one quiz. Mr. Noland and staff.

9. ELEMENTARY ENTOMOLOGY. II; 3 cr. Lectures on the life problems and adaptations of insects. Collecting and classifying of insects. Lab. fee $3. 10 MWF. Mr. Marshall.

17. SURVEY OF ZOOLOGY: HOW ANIMALS LIVE. I; 3 cr. A brief introductory course in biological principles as illustrated in animals. Designed to fulfill in part the non-professional science option for the B.A. degree. May be credited by students in the Ph.B. course only as a free elective. Open to all students, excepting those who have taken Zoology 1. Lab. fee $5.00. Lecture 8 TT; one three-hour laboratory and quiz period. Mr. Wagner and staff.

100. SENIOR THESIS. Yr; 2 cr. Original, individual work for zoology majors of upper-group status. Staff.

102. INVERTEBRATE ZOOLOGY. I; 5 cr. Structure, development, life history, and adaptations of invertebrate animals. Prerequisite: Zoology 1. Lab. fee $10.00. 1:30-4:30 MWF. Mr. Noland and staff.

103. THE VERTEBRATES. II; 2 cr. Lectures on classification, life history, and adaptations of vertebrate animals. Prerequisite: Zoology 1. 8 TT. Mr. Wagner.

104. COMPARATIVE ANATOMY OF VERTEBRATES. II; 5 cr. Lectures comparing structure and development of organ systems in the different vertebrate groups. Laboratory dissection of shark, mud-puppy, and cat, and comparative studies on other vertebrates. Prerequisite: Zoology 1. Lab. fee $10.00. Lecture 1:30 MWF; 6 hrs. lab. Mr. Wagner and staff.

105. Vertebrate Embryology. I; 3 cr. The early embryological development of vertebrates, including fertilization, cleavage, and origin of organ systems. Prerequisite: Zoology 1. Lab. fee $7.00. Lecture 1:30 TT; 4 hrs. lab. Mr. Hisaw and staff.

106. Heredity and Eugenics. I; 2 cr. The laws of heredity, their application to man, and the importance of the biological principles underlying race-betterment. Not open to freshmen. Lecture 3:30 TT; quiz. Mr. Guyer.

107. Organic Evolution. II; 2 cr. A critical consideration of organic evolution and how it has taken place. Not open to freshmen. 11 TT. Mr. Wagner.

108. Protozoology. II; 3 cr. Structure, physiology, life history, and adaptations of Protozoa, especially the non-parasitic ones. Prerequisite: Zoology 102 or consent of instructor. Lab. fee $3.00. 1:30-4:30 TT. Mr. Noland.

109. Advanced Vertebrate Embryology. II; 2 cr. An advanced course dealing with the differentiation and development of tissues and organs; organogeny. Prerequisite: Zoology 105 or Anatomy 115. Lab. fee $6. 1:30-3:30 MW. Mr. Hisaw.

110. Entomology: Anatomy and Embryology. I; 3 cr. Anatomy, histology and development of insects. Prerequisite: An elementary course in entomology. Lab. fee. $4. Mr. Marshall.

111. Micro-Technique. I; 3 cr. Training in the preparation of histological material, including practice in fixing, staining, mounting, maceration, and sectioning by the paraffin, celloidin, and freezing methods. Prerequisite: Zoology 1. Lab. fee $12.00. 8-11 MW. Miss Bilstad.

112. Insects and Man. I; 2 cr. Lectures on harmful and beneficial insects in their relation to man and his domesticated animals and plants. 10 MW. Mr. Marshall.

113. Comparative Animal Histology. II; 3 cr. A comparative study of the tissues and organs of vertebrate and invertebrate animals. Prerequisite: Zoology 1 or 3. Lab. fee $6. 9-12 MW. Mr. Hisaw.

119. Animal Parasites. II; 3 cr. A survey of animal parasites, especially those of man and domesticated animals. For medical students and others interested in public health problems. Veterinary students may take laboratory alone for two credits. Prerequisite: Zoology 1 or 3. Lab. fee $8.00. Lecture 9 TT; 4 hrs. lab. Mr. Herrick and staff.

120. Advanced Parasitology. I; 2 cr. Advanced work on the identification and life histories of parasites, and the diagnosis of parasitic diseases. Prerequisite: Zoology 119. Lab. fee $5. 10-12 TT. Mr. Herrick.

122. Endocrinology. I; 2 cr. The general physiology of hormones and glands of internal secretion. Prerequisites: Zoology 105, Chemistry 1a. 11 MW. Mr. Hisaw.

123. Advanced Entomology. I, II; *cr. For students who desire to pursue some special line of advanced entomological work. Prerequisite: Zoology 9. Mr. Marshall.

124. Limnology. I; 2 cr. The geology, physics, chemistry, and biology of lakes, supplemented by training in limnological methods. Special attention is given to studies on Wisconsin lakes. Prerequisite: Zoology 1, Chemistry 1a. Mr. Juday.

125. Plankton Organisms. II; 2 cr. Identification, distribution, variation, and economic importance of plankton forms. Field work consists of physical, chemical, and biological observations on lakes. Prerequisite: Botany 1, Zoology 1. Mr. Juday.

126. Field Zoology. I; 4 cr. Field trips; observing and collecting of local animals; identification and study of collected species in the laboratory. Prerequisite: 10 credits of college zoology. Lab. fee $3. 1:30-5:30 TT. Mr. Noland.

180. Advanced Zoological Problems. I, II; 2-5 cr. Individual work dealing with advanced phases of zoology not taken up in the regular courses. Prerequisite: Consent of instructor. Lab. fee $5. Staff.

200. Graduate Research. I, II; 2-5 cr. Lab. fee $5. Staff.

201. Proseminary. Yr; 2 cr. Devoted to a discussion of the history of zoology. Distribution of graduate students between seminary and proseminary will be arranged in consultation with the instructors in charge. Specially qualified seniors are occasionally admitted to the proseminary. 3:30-5:30 F. Mr. Wagner.

214. Anatomy and Physiology of the Cell. I; 2 cr. The physics and chemistry of the cell, theory of staining, colloidal nature of protoplasm, semi-permeable membranes, effects of electrolytes, phenomena of metabolism, stimulation and transformation of energy. Prerequisites: Chemistry 1; Zoology 105 or 111. 11 TT. Mr. Guyer.

215. The Cell in Development and Inheritance. II; 2 cr. The chromosomal mechanism of the cell, and its relation to recent discoveries in experimental embryology and genetics. Prerequisite: Zoology 105. 11 TT. Mr. Guyer.

216. Cytology. Yr; 3 cr. An introduction to cytological technique and the general field of cellular biology. Prerequisite: Zoology 111. Hours by arrangement. Lab. fee $6. Mr. Guyer.

220. Seminary. Yr; 2 cr. Oral reports and discussions of advanced zoological subjects by members of the class. 3:30-5:30 F. Mr. Guyer.

COLLEGE OF ENGINEERING

F. E. TURNEAURE, DEAN

ORGANIZATION OF THE COLLEGE

The College of Engineering is organized in the belief that a thorough-going fundamental training is the first essential to a successful engineer. It is believed that this fundamental training may be best secured not alone by theoretical study, but by giving attention as well to the practical application of the principles involved. It is further a leading thought that after the fundamental principles have been mastered, a certain measure of specialization in the main lines of engineering is advisable because of the great development of engineering in recent years, and the various phases which it is rapidly assuming. It is the endeavor of the college to combine a reasonable amount of specialization during the later years of its courses with a thorough grounding in the fundamentals during the earlier portions; and in carrying out this plan, the mathematical and theoretical courses constitute the main body of the program in the earlier years, and the later years are devoted more largely to the applications of these fundamentals to engineering problems.

Engineering students are urged to take their elective work in foreign language, advanced English, economics, public speaking, and other subjects of a general rather than a technical nature.

BUILDINGS

The main building of the College of Engineering contains the offices of administration, the engineering library, the materials testing laboratory, and the departments of drawing, mechanics, and structural, highway, and railway engineering. The new Mechanical Engineering Building has recitation, lecture, and drafting rooms, the steam and gas laboratories, and the engineering shops. A third building contains the electrical laboratories; a fourth, the laboratories for chemical engineering; a fifth, the hydraulics laboratory; and a sixth, the mining building, contains the ore dressing, assay, and metallurgical laboratories.

For chemistry the engineering students go to the Chemistry Building, for physics to Sterling Hall, for natural sciences to Science Hall and the Biology Building, and for language, mathematics, and similar work to other buildings of the University. In this way the students of engineering come into daily contact with the students in the other university courses.

LIBRARIES

The Library of the College of Engineering is located in the Engineering Building and contains a large collection of technical books and periodicals. The current numbers of about 250 engineering periodicals are available in the reading room, and the bound volumes in the library include complete sets of all the important transactions and magazines. In addition to the college library, there are the University Library, containing about 436,500 volumes and 70,000 pamphlets, the Library of the State Historical Society (274,000 volumes and

292,000 pamphlets), the Library of the Wisconsin Academy of Sciences, Arts, and Letters (5,000 titles), and the Madison Free Library (90,000 volumes), to which students have free access.

ADMISSION

See section on Admission, page 33.

GENERAL REGULATIONS

PREPARATION IN ALGEBRA

One and one-half units of algebra are required for entrance. The first unit should include the following subjects: addition, substraction, multiplication, division, equations of the first degree with one unknown number, simultaneous equations of the first degree, including the graphical solution of a pair of linear equations with two unknowns, factors, highest common factor, lowest common multiple, the solution of quadratic equations.

The additional one-half unit should cover the following subjects: simultaneous quadratic equations; ratio, proportion, and variation, elementary theory of exponents and radicals; the theory of quadratic equations; graphical representation of simple relation between two variables; binomial theorem for positive integral exponents; logarithms, including use of tables in simple numerical work; arithmetical and geometrical progressions.

All students entering the College of Engineering will be tested in algebra by class work and by an examination given shortly after the beginning of the first semester. It is essential that students in the engineering courses shall possess a good working knowledge of algebra at the time when they begin their course, and it is the purpose of the examination to secure this by requiring a review of the subject shortly before entering the University. Students failing in the test are not permitted to continue with regular freshman mathematics, but are required to take a review of algebra during the first semester. A special non-credit course is provided for this purpose.

ADVISERS

At the beginning of each semester the students consult their faculty advisers as to the selection of subjects and the arrangement of programs. These advisers keep in touch with the students' work during the semester, receive reports from instructors as to progress, suggest methods for improvement in work, and report gross deficiencies to parents or to the faculty.

Reports to parents or guardians on the scholastic standings of students are sent from the Registrar's office at the end of each semester.

GRADE-POINT SYSTEM

Under the grade-point system, points are awarded as follows: For Grade A (*excellent*), three points for each credit; for grade B (*good*), two points; for grade C (*fair*), one point; for grade D (*poor*), no points. In the College of Engineering at least 146 grade-points and 146 credits, exclusive of freshman lecture, physical education, band, and military science, are required for graduation from any one of the four-year courses. No student will be recommended for the degree of Bachelor of Science who does not earn at least one grade-point per credit during the last two semesters of his attendance at the University.

HONORS

Honors and high honors are awarded at the end of the sophomore year, and at graduation, to students who have spent not less than two full years in residence in the University. The studies, however, may be taken in residence at Madison or Milwaukee, or partly by correspondence. In computing credits and points for honors or high honors, the following subjects are not included: sub-freshman subjects, physical education, band, and basic courses in the Military Department; credits obtained by special examinations, and credits earned at other institutions.

Sophomore Honors and Sophomore High Honors are awarded on the basis of a minimum of two years' work (not less than 60 credits, exclusive of physical education, band, military science, and freshman lectures) completed in the University. A student earning during these two years 135 grade-points, plus 1.5 grade-points for each credit above 60 which he has taken will be awarded *sophomore honors;* a student earning during these two years 165 grade-points plus 2 grade-points for each credit above 60 which he has taken, will be awarded *sophomore high honors.*

Honors and High Honors at Graduation. Students having an average of 2.25 or more and less than 2.75 points per credit at graduation, will be awarded *honors.* Students having an average of 2.75 or more points per credit will be awarded *high honors.*

FEES AND EXPENSES

See section on Student Expense, page 15.

COURSES OF STUDY AND DEGREES

The College of Engineering offers six systematic four-year courses leading to the B.S. degree.

Civil Engineering
Mechanical Engineering
Electrical Engineering
Chemical Engineering.
Mining Engineering
Metallurgical Engineering.

Students who complete any of the above four-year courses are graduated with a degree of Bachelor of Science, the diploma containing a specific designation of the course taken.

The above courses may also be taken as five-year courses leading to the B.S. degree. The additional year will make it possible to include a large amount of work in the College of Letters and Science.

ELECTIVES FOR STUDENTS IN THE COLLEGE OF LETTERS AND SCIENCE WHO PLAN TO TAKE ENGINEERING LATER

Students who plan to graduate in Engineering, after taking a degree in the College of Letters and Science, should aim to make the following elections during the undergraduate course, in order that the engineering course may be completed in two additional years:

Mathematics 51, 52, 54, and 55; Physics 1 or 51 and 52; Chemistry 1 or 2; Mechanical Drawing 1, 2, and 3; Topographical Engineering 1, 2, 3, and 104, or Machine Design 1; Mechanics 1, 2; Electrical Engineering 1 and 51; Chemical Engineering 12, 18, and 111; Mining Engineering 101, 121, 122; and Geology 9.

It is well also to elect some or all of the freshman and sophomore shop work as extra studies.

GRADUATION IN MORE THAN ONE OF THE ENGINEERING COURSES

Graduates in any of the engineering courses may graduate in any other engineering course after one year of additional study. However, students who contemplate doing this should make their elections, especially in the senior year, with this end in view.

SUMMER VACATION WORK

All engineering students are required to take summer vacation work in addition to the work of the four academic years. For civil engineering students this work consists of four weeks of topographic engineering field work and two weeks of railway engineering field work. These courses are given at the University Survey Camp at Devils Lake, Wisconsin. For mechanical engineering the requirement consists of not less than six weeks of approved summer work in industrial practice. Electrical engineers are required to take six weeks of approved summer work in an engineering or industrial organization. The chemical engineers are required to work five weeks, at the close of the junior year, in the university laboratory on chemical manufacture. Mining engineers spend a considerable portion of two summer vacations at work in the different mining regions and metallurgical centers. A very detailed report is submitted of their observations of conditions, methods, and operations in the district visited. In addition the long mine and metallurgical inspection trip is taken at the end of the junior year.

INSPECTION TRIPS

Inspection trips, for visiting industrial plants, are required of all engineering students during the junior and senior years. They are arranged and conducted by members of the faculty of the various departments and are designed to illustrate the work of the several courses.

The electrical and mechanical engineers take the trip in the autumn of the senior year. The trip takes a week's time and visits are made to plants in Milwaukee, Kenosha, Waukegan, Chicago, Buffington, and Gary.

The civil engineers visit the cities of Chicago and Milwaukee, the former in the spring of the junior year, the latter in the autumn of the senior year. Each of these trips takes three or four days.

The chemical engineers make a week's visit to Milwaukee, Chicago, and points near by in the spring of the junior year.

In the second semester of the freshman year, mining engineers take a trip to a mine in one of the nearer districts for the purpose of a complete mine survey, and while there make a complete inspection of the operation.

In metallurgy the students annually inspect the metallurgical works around Chicago, the trip lasting a week.

At the end of the junior year or, if advisable, just after their commencement, students in the courses in mining and metallurgy are required to take a long western inspection trip, visiting mining and metallurgical centers throughout the northwest. This trip lasts about six weeks.

THESES

In all courses, candidates for a second or a professional degree in engineering shall submit a thesis. The thesis requirements for the B.S. degree in the different courses in the College of Engineering are as follows:

In the civil engineering course a thesis is required. In the electrical, mechanical, and mining engineering courses a thesis is optional. In chemical engineering a course in special problems replaces the thesis requirement.

If a thesis is taken, the subject of the thesis shall be selected by the student after consultation between the student, his adviser, and the instructor who is to direct the work, and it shall be submitted to the Course Committee for approval. The total number of credit hours granted for this work shall be not less than three nor more than five, except by special action. The thesis is to be typewritten according to specifications furnished by the librarian of the University, and before it is accepted it must be approved by the instructor under whom the work has been done. It shall be deposited in the University Library by the second Friday before Commencement.

FRESHMAN LECTURES

The College has provided a course of lectures for freshmen. Attendance is required. In the lectures of this course it is the aim to give the student a more adequate conception of the work of the engineer, to make clear the kind of training which furnishes the best preparation for the practice of the engineerng profession, and to call attention to the methods of study which have been found to produce satisfactory results. The course also includes several lectures on subjects of more general interest.

SPECIAL LECTURES

It is the practice of the College to provide each year a number of lectures on various phases of engineering practice. These lectures are for the most part given by prominent non-resident engineers and professors; some are given by Wisconsin professors. Their purpose is to enliven the interest of the student and to broaden his horizon, rather than to give specific instruction. The following lectures were given recently:

March 5, 1930.

T. C. Fry, Technical Engineer for the Bell Telephone Laboratories. "The Modern Use of Probability."

March 21, 1930.

James Everett Mackie, Structural Engineer for the National Lumber Manufacturers Association. "Correct Uses of Lumber in Construction."

May 7, 1930.

J. G. Pearce, Director and Secretary of the British Cast Iron Research Association. "Cast Iron Specifications."

April 20, 1931.

D. R. Brewster, Lumber Utilization Engineer for the National Lumber Manufacturers' Association. "The Grading of Lumber and its Use in Engineering construction."

GRADUATE WORK

The graduate work in the College of Engineering is a part of the Graduate School of the University, and is in charge of an administrative committee. Excellent opportunities are offered in the various departments for advanced theoretical work and for research. A special fund is available to be devoted exclusively to experimental work in the engineering laboratories.

For admission to the Graduate School an official transcript of the undergraduate record of the applicant should be forwarded to the Dean of the Graduate School, Bascom Hall, some weeks in advance of the opening of the session.

The degree of Master of Science (in civil engineering, mechanical engineering, etc.) is conferred upon graduates of approved institutions who have completed suitable undergraduate courses and who pursue advanced professional study at the University for one year or more, present a satisfactory thesis, and pass an oral examination upon the field of their graduate work.

The degrees of Civil Engineer, Mechanical Engineer, Electrical Engineer, Chemical Engineer, Engineer of Mines, and Metallurgical Engineer are conferred upon graduates of the College of Engineering of the University of Wisconsin who have spent five years in professional work, at least one of which must have been in a position of responsibility, and who present a satisfactory thesis.

The degree of Doctor of Philosophy is conferred upon graduates of the engineering courses under the same requirements as apply to graduates of other divisions of the University.

For statements of these requirements, see Graduate School.

CIVIL ENGINEERING COURSE

GENERAL STATEMENT

The course in civil engineering is designed to accomplish two things: First, it aims to give its graduates sufficient skill in certain technical operations to enable them to be of immediate value to an employer. The graduate enters civil engineering as a computer, draftsman, instrument man, timekeeper, or inspector, and he should be able to do creditable work in some one of these lines. Second, the course aims to train men to analyze engineering problems scientifically and reach sound conclusions about them.

The first two years of the course parallel closely the first two years of the other engineering courses in this college and are devoted chiefly to the study of English, mathematics, physics, and chemistry. During the last two years of the course the student is brought into contact with problems in various fields of civil engineering, partly to give him some familiarity with those fields, but chiefly to develop his powers of analysis and his judgment. Excellent laboratories enable the student to verify the theory he learns in the class room and to become familiar with research methods.

In addition to the technical objectives outlined above, the course is designed to give a training that will enable its graduates to hold their own in business and social intercourse and rise to the highest positions of responsibility in business and public affairs.

The course is administered with sufficient flexibility to permit a student to satisfy any reasonable desires in regard to the subjects to be studied. Those students who desire a greater amount of liberal education than can be crowded into a four-year curriculum can arrange special five- and six-year programs.

The four-year course leads to the degree of Bachelor of Science. The degrees of Master of Science and Doctor of Philosophy can be earned by graduate work. The degree of Civil Engineer is granted to graduates of the course who have had five years of successful practice in civil engineering and who comply with certain formalities.

EQUIPMENT

THE SURVEYING LABORATORY contains all instruments needed for extensive triangulation, topographic, hydrographic, and railroad surveys, including aneroid barometers, baseline apparatus, calculating machines, compasses, current meters, heliotropes, levels, invar tape, pantographs, plane tables, planimeters, precise-levels, sextants, sounding apparatus, theodolites, transits, and other smaller articles of surveying equipment.

THE BRIDGE ENGINEERING DEPARTMENT owns several autographic extensometers, a deflectometer for determining bridge stresses under moving train loads and a Beggs Deformeter. The department also possesses a large number of photographs, drawings, and lantern slides illustrating details, erection methods, and complete structures of a great variety of designs.

THE TESTING LABORATORY is supplied with a 600,000-pound hydraulic universal testing machine (designed in the laboratory) taking tension and compression specimens 29 feet and beams 39 feet long; a Riehlè torsion machine taking shafts 15 feet long and 3 inches in diameter; and 100,000-pound Johnson beam machine taking beams 22 feet long; seven Olsen and Riehlè universal machines from 10,000 to 200,000 pounds capacity; a Thurston torsion machine; a Russell impact machine; machines for fatigue tests of metals; Brinell, Rockwell, and scleroscope hardness testers; several small beam and wire machines; a 3-ton refrigerator for freezing tests; a Smith concrete mixer; a good equipment for tests of plain and reinforced concrete; and appliances for testing road-building material. There is a full supply of necessary apparatus for making standard tests of cement baths, self recording thermometers, complete equipment of 1,000-pound Riehlè and Olsen testing machines, etc.

HYDRAULIC LABORATORY. A special building for this laboratory is located on the shore of Lake Mendota. It is equipped for theoretical, experimental, and research work. The facilities are especially good for studying those problems where large quantities of water are needed. A direct-connected 30-inch centrifugal pump furnishes up to 35,000 gallons of water a minute under a twelve-foot head. This water is delivered into a receiving chamber connected with various conduits and channels. Investigations can be conducted covering the flow in such channels and conduits together with the effects thereon of dams, weirs, racks, submerged orifices, and other features encountered in water power work.

A concrete reservoir, 50 ft. in diameter by 15 ft. deep, with a capacity of 220,000 gallons, is located on the bluffs at an elevaton of about 60 ft. above the laboratory. It is connected to the laboratory by a 16-inch delivery pipe and 10-inch supply line. Its installation has made possible experiments which require a considerable flow of water under a very steady head, tests on turbines under heads up to 50 feet and the ready calibration of the largest weirs in the laboratory.

Very favorable facilities are afforded for the study of losses due to valves and other forms of restricted passages or to sudden changes in pipe section, and for the study of flow in straight and curved pipes, and through weirs and orifices of practically any type.

A large assortment of accurate apparatus for the measurement of quantities, velocities, and pressures, both in open and closed channels, is available, includng a variety of water meters, among them various Venturi meters.

The laboratory is equipped with several types of impulse water-wheels including tangential and Girard turbines, reaction turbines with cylinder register, and wicket gates. The pumping machinery includes both duplex and triplex reciprocating pumps, centrifugal pumps, vacuum pumps, jet pumps, and the hydraulic ram.

The electric power supply is favorable to accurate work on hydraulic machine testing. A 175 k. w. synchronous motor generator set supplies 220 volts, direct current, through four feeder lines into the laboratory. Unusually exact speed regulation can be obtained with noninterference of testing apparatus.

The regular course of instruction includes a careful selection of typical determinations, and opportunities are offered for advanced and research work in practical hydraulics and hydraulic machinery as well as in the more advanced lines.

Sanitary Laboratory. A well equipped sanitary laboratory is housed near the Hydraulic Laboratory. The apparatus available for the use of the students includes all modern equipment necessary in making accurate sewage and trade wastes analysis. The course of instruction includes work of an advanced nature, where the student can observe for himself the analysis studied in the theoretical courses, and at the same time carry on some research work to assist in the solution of many of the present problems in sewage and trade wastes disposal and in stream pollution.

The Road Materials Testing Laboratory. In cooperation with the Wisconsin Highway Commission the University offers instruction in the testing of both bituminous and non-bituminous road materials. The equipment in the laboratories is sufficient to perform all of the standard tests.

Other Laboratories. The mechanical and electrical laboratories and the machine shop are open to civil engineering students; they will be found described on subsequent pages. For description of the laboratories of the science departments of the University, all of which are open to engineering students, see other portions of this Announcement.

CIVIL ENGINEERING COURSE

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (CIVIL ENGINEERING)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Math. 51—Elementary analysis	5	Math. 52—Elementary analysis	5
Drawing 1—Elements of drawing	3	Drawing 2—Elements of drawing	3
Chem. 2a—General chemistry	4	Chem. 2b—General chemistry	4
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Top. Engr. 1—Elementary surveying	2	Top. Engr. 2—Elementary surveying	2
Physical activity requirement	0	Physical activity requirement	0
Freshman lectures	0	Freshman lectures	0
	17		17

SOPHOMORE YEAR

Math. 54—Differential and integral calculus	4	Math. 55—Calculus	4
Physics 51—General physics	5	Physics 52—General physics	5
Railway Engr. 1—Railway curves	2	Mech. 1, 2—Statics, dynamics	5
Railway Engr. 2—Theory of location and construction	3	Top. Engr. 104—Advanced surveying	3
Top. Engr. 3—Land surveying	3	Physical activity requirement	0
Physical activity requirement	0		17
	17		

Six weeks of summer camp, including two weeks of Railway Survey and four weeks of Topographical Engineering.

JUNIOR YEAR

Mech. 3—Mechanics of materials	5	Mech. 52—Materials of construction	2
Mech. 51—Materials of construction	2	Hydr. 122—Sewerage	2
Hydr. 2—Elementary hydraulics	4	Railway Engr. 110—Masonry construction	2
Drawing 3—Descriptive geometry	3	Struct. Engr. 2—Stresses in simple structures	4
Geol. 9—Engineering geology	3	Steam and Gas 7—Engines and boilers	2
Hydr. 110—Hydrology	2	Econ. 1a—General economics	4
Engr. Engl. 1a—Papers and discussion	1	Engr. Engl. 1b—Papers and discussions	1
	20	Highway Engr. 102—Highway engineering	3
			20

SENIOR YEAR

Struct. Engr. 3—Bridge design	3	Engr. Contr. 101—Contracts and specifications	2
Struct. Engr. 105—Reinforced concrete	3	Struct. Engr. 4—Bridge design	2
Steam and Gas 127—Laboratory	2	Elect. Engr. 10, 60—Direct current machinery	4
Hydr. 121—Water supply	3	Railway Engr. 111—Substructures	1
Engr. Engl. 2a—Papers and discussions	1	Engr. Engl. 2b—Papers and discussions	1
Thesis	1	Thesis	2-4
Electives	6	Electives	7-5
	19		19

At the beginning of the junior year, the students must elect to pursue one of the following groups of studies:

STRUCTURAL OPTION

Struct. Engr. 107—Higher structures.... 2
Struct. Engr. 111—Reinforced concrete design 2
Struct. Engr. 108—Secondary stresses... 2
or
Mech. 106—Advanced mechanics .....(2)

Additional electives: Structural Engineering 106, 109, 112; Mechanics 108.

RAILWAY OPTION

Ten credits to be elected from the following group:

Railway Engr. 105—Engineering economics 2
Railway Engr. 107—Advanced design..... 2
Min. Engr. 101—Excavation and tunneling 3
Econ. 135—Railway transportation 3
Econ. 136—Transportation problems .. 3
Elect. Engr. 129—Electric railways..... 3
Railway Engr. 112—Estimates..... 2

HYDRAULIC OPTION

Hydr. 102—Testing of hydraulic machines 2
Hydr. 104—Water power engineering.... 3
Hydr. 113—Hydraulic design 2
Hydr. 105—Hydraulic machinery..... 2
Hydr. 112—Drainage and irrigation..... 2
Hydr. 114—Hydraulic design 2

MUNICIPAL OPTION

City Plan. 101—City planning and zoning 2
City Plan. 104—Municipal engineering practice 2
Hydr. 124—Water and sewage analysis.. 2
Hydr. 112—Drainage and irrigation..... 2
Hydr. 123—Sewage and garbage disposal 1
City Plan. 101—City planning and zoning (repeated) 2

HIGHWAY OPTION

Highway Engr. 103—Adv. highway design 3
Highway Engr. 105—Highway maintenance 2
City Plan. 101—City planning and zoning 2
Highway Engr. 104—Highway materials testing 3
Struct. Engr. 112—Highway bridges..... 2
City Plan. 101—City planning (repeated) 2
Top. Engr. 108 is recommended

GENERAL OPTION

All electives are free, excepting that not more than half can be taken in the department providing special optional groups.

INSPECTION TRIPS

Junior Trip, 2nd semester. Prerequisites: Ry.E. 2, Ry.E. 110, Mech. 52 or concurrent registration.

Senior Trip, 1st semester. Prerequisites: Structures 2, Hydraulics 2 and 122.

MECHANICAL ENGINEERING COURSE

GENERAL STATEMENT

The four-year course offered in mechanical engineering leads to the degree of Bachelor of Science (Mechanical Engineering) and is open to graduates of accredited high schools, and students entering by examination or with proper credits from other schools or colleges.

The first two years of the course, and a portion of the junior year, are devoted principally to the fundamental studies of mathematics, chemistry, mechanical drawing, machine design, physics, mechanics, and shop work, while during the junior and senior years the professional subjects are introduced. The treatment of these professional subjects is along as broad lines as possible, in order to make them of the greatest educational as well as technical value to the students.

As it is difficult for most students to determine in advance their professional career it is desirable that their college training shall follow a general direction and be free from excessive specialization. To this end the mechanical course includes studies dealing with the elements of direct and alternating currents and hydraulics, in addition to the subjects of steam engines and boilers, heating and ventilating, machine design and shop practice.

In the senior year courses are offered which are designed to give the commercial point of view in many of the problems of engineering. With these subjects the mental attitude of the student is brought into conformity with that of actual practice as far as possible.

Elective credits in the junior and senior years allow students in mechanical engineering to take fundamental subjects in other engineering courses, such as civil, chemical, or mining engineering in addition to correlated work in economics and business administration as well as general subjects.

EQUIPMENT

THE ENGINEERING SHOP LABORATORIES afford excellent facilities for mechanical practice. The six laboratories are for machine, forge, pattern, foundry, carpentry, and welding practice.

The Machine Laboratory has a well balanced and modern equipment for handling classes in elementary, advanced, and general shop work. Production methods are emphasized. Johansson blocks and other precision tools afford practice in modern measuring devices. An up-to-date tool room insures an excellent condition of machines.

The Forge Laboratory is equipped with the latest design down-draft forges and direct-connected blast-exhaust unit. A steam hammer, shears, grindstones, and hand tools form an adequate equipment.

The Pattern Laboratory has 24 wood lathes and standard individual work benches with the necessary tools for general pattern making. Two band saws, two jointers, a circular saw, a surfacer, and three combination sanders form part of the machine equipment.

The Foundry is equipped with a 36-inch cupola, brass furnace, core oven, molding machines, 20 individual molding benches with sets of tools, air rammers, sand blast equipment, motor driven riddle, and a two-ton electric crane.

The Carpentry Laboratory is well equipped for the needs of agricultural carpentry. Ample tools for this phase of work are provided.

In the Welding Laboratory ample provision is made for practice in electric arc and acetylene welding by an up-to-date equipment representative of the best manufacturers.

EXPERIMENTAL ENGINEERING. The work in this subject is planned so that it illustrates the principles taught in the classroom by tests on the various types of heat engines. The student is first taught how to calibrate the various instruments used in such tests, to set valves and then to make efficiency tests of engines, boilers, gas producers, and other machinery. As a preliminary to the testing of boilers and gas producers, instruction is given in the use of the various steam, coal, and gas calorimeters, flue gas apparatus and apparatus for the analysis of fuel and gases. Instruction is also given in the methods of measuring flow of air and of testing air compressors, blowers, and refrigerating machines. In the junior year the students study various methods of measuring power and determining mechanical efficiency, testing of oils, determination of friction with regard to lubricants and bearing materials. The courses are laid out with the idea of giving the necessary information and practice in the testing of various machines, and of encouraging accuracy in work and originality in investigation. For thesis work the laboratories offer unusual opportunities in the way of special apparatus.

STEAM AND GAS ENGINE LABORATORY. *The steam and internal-combustion engine laboratory* extends two stories in height and conforms with modern power plant design. There is a long open condenser pit, a traveling crane, and other modern facilities.

All of the equipment of the laboratory is specially arranged for experimental work, and for demonstration of the principles discussed in the class room. A means of supplying load for each of the engines is provided. On many of the engines a simple friction brake is used, while for high-speed units either electric generators or water dynamometers are used. The steam driven units are supplied with condensers in order that the exhaust steam may be weighed.

The more important *steam driven units* are a 25-kilowatt Curtis turbine, a 25-horsepower simple Corliss steam engine, and a complete refrigeration plant. The main unit of the refrigeration plant is a 15-ton direct-connected Corliss engine-driven ammonia compressor. Also, this plant includes a double-pipe ammonia condenser and a double-pipe brine cooler besides some automatic control equipment. A 50-horsepower cross-compound poppet-valve steam engine is fitted with steam jacketed receiver and cylinders. Tests can be made with either superheated or saturated steam, condensing or non-condensing, with or without steam in the steam jackets, and with or without reheating between cylinders. This furnishes a means for studying the effect of such conditions upon steam consumption. Moreover, the speed of this unit may be varied from 90 to 125 revolutions per minute, while the cut-off has a range of automatic variation between 0 and 95 per cent of the stroke.

A 50-horsepower compound steam engine is directly connected to a two-stage air compressor. The engine is equipped with a Meyer valve gear and operates condensing. The base of the unit contains an intercooler for the air and a receiver for the steam end. An orifice is used for measuring the quantity of air compressed. A locomotive-type air compressor is also arranged for test purposes.

Equipment is arranged for determining the accuracy of steam metering devices. Steam flows through an electric flow meter, a balance type of flow meter, a Pitot tube, a Venturi meter, and several orifices and nozzles. By condensing and weighing the steam, a calibration may be obtained for each method of measurement.

Such stations as the University Central Heating Plant, the Capitol Heating Plant, the central station of the Madison Gas and Electric Company, and the City Water Works Plant are used in addition to actual laboratory equipment. Tests are run each year by the students at some of the above mentioned plants. The boiler house of the University which furnishes steam for all the buildings of the institution, both for heating and for power purposes, has a normal capacity of 5528 boiler horsepower. It is equipped with special testing apparatus so that experimental work may be carried on relating to the economy of boilers under various service conditions.

The *internal combustion* engines range in size up to a 40-horsepower full Diesel type engine. This is a vertical single cylinder unit, and is a modern piece of equipment. It is a two-stroke cycle engine of the solid injection type, and it will operate on a wide range of fuel oils. There is a 25-horsepower semi-Diesel engine besides some smaller units which will operate on crude oil or kerosene.

Routine class tests are run on a 40-horsepower city gas engine. A 20-horsepower engine which was built especially for test purposes can be fitted with a variety of heads, vaporizers, valves, governors, and auxiliary equipment. This permits testing the engine with city gas, producer gas, gasoline, kerosene, alcohol, or other liquid fuels as desired. Floor slots have been provided for setting machinery in this portion of the laboratory so that engines may be quickly set up for temporary test work. The Fairbanks, Morse and Company Beloit works has loaned the department a modern high-speed three-cylinder 45-horsepower Diesel engine which is now being used for experimental test work.

A hot-air engine is operated on city gas to pump water and demonstrate the possibility of an external combustion engine.

The calibration laboratory is located on the balcomy at the front of the main laboratory. In this laboratory, there are deadweight gage testers, vacuum pumps with mercury columns, and a fluid pressure scale with which gages and indicators can be tested to pressures of 25,000 pounds per square inch. Steam drums are used for calibrating inside spring indicators under working conditions.

The oil testing laboratory is located on the balcony at the rear of the main laboratory. Its equipment consists of viscosimeters for determining viscosity of oils at different temperatures, and apparatus for determining the flash, fire, and pour points. A modern fume hood and exhaust blower have been installed so that oil tests may be carried out conveniently and accurately. Many oils are tested both in the oil test laboratory and in actual service in connection with engine tests.

There is also an abundance of equipment for making complete tests for determining the economy and capacity of boilers, engines, and gas machinery. This equipment comprises weighing scales, measuring tanks, pyrometers, thermometers, calorimeters, indicators, revolution counters, tachometers, stop watches, planimeters, hydrometers, psychrometers, recording gauges, reducing motions, gas meters, water meters, manometers, draft gauges, and gas analysis apparatus. The laboratory also contains a number of machines for special test purposes, and several steam injectors and nozzles especially arranged so that test data may easily be obtained.

Research rooms have been provided so that special research projects may be carried on without any interference with other laboratory work. There are four such rooms on the third floor of the building.

Automotive testing laboratory. The high-speed, internal combustion engine laboratory is located in the basement at the rear of the east wing of the building.

Special testing devices are available for testing marine, airplane, automobile, and truck motors. A 150-horsepower dynamometer furnishes a most up-to-date method for testing high-speed engines up to 3,500 revolutions per minute. By a combination of this machine and a calibrated fan dynamometer 250-horespower can be absorbed. There are many automatic devices used in connection with the dynamometer unit in order to get the greatest possible accuracy of test. Several makes of automobile and airplane motors are available for tests. A track arrangement permits an easy and quick means for shifting the dynamometer from one engine to another. Recently, a standard S. A. E. variable compression engine has been installed for the study of the detonating qualities of liquid fuels. Compression ratios can be varied from 3.5 to 1 to 9 to 1 while the engine is in operation. By means of this engine, gasoline can be rated in octane numbers.

Boiler efficiency testing laboratory. The boiler room is located between the steam engine laboratory and the heating and ventilating laboratory. Thus it serves as a testing place for both power and heating plant type of boilers. Efficiency tests can be run on these boilers with a variety of fuels and types of firing. Boiler feed pumps and vacuum heating plant pumps are arranged for test purposes.

A separately fired steam superheater is arranged to supply superheated steam to the main steam loop and hence to any of the steam units. A small vertical boiler and engine is used to familiarize the student with the essential parts of a simple steam power plant and the problems connected with its efficient operation. Tests are planned so that they prepare the student for the more complicated plant tests.

Heating, ventilating, and refrigerating laboratory. The single story high ceiling of the central wing of the building furnishes an ideal laboratory of testing various types of heating, ventilating, and refrigerating equipment.

An air conditioner in the laboratory is capable of washing, cooling, humidifying, and dehumidifying air. A modern type of dust determinator is used in connection with air testing. An extensive arrangement is installed for determining the infiltration of air around doors and windows under various conditions of wind pressure. Types of windows, metal weather stripping, and many types of wall construction are problems under investigation. Unit heaters and ventilators are arranged for both efficiency and rating tests. Several ventilating fans and blowers are available for test purposes.

Air measurement in the laboratory can be accomplished by a variety of methods. A series of meters have been arranged to facilitate the comparison and calibration of air or gas meters. A Thomas electric gas meter, a Pitot tube, an anemometer, and orifice are some of the more important metering devices.

In addition to the heating and ventilating apparatus in this laboratory, the heating system of the building will be used for practical studies. A variety of systems and combinations of heating and ventilating equipment have been installed in different parts of the building for the purpose of making comparative studies.

Machine Design Laboratory. This laboratory is located in the basement in the front portion of the building. The equipment includes a Best testing machine, several forms of transmission dynamometers, and apparatus for testing hoists and screw jacks . Also, there are means for determining the relative efficiency of various forms of shaft bearings.

The Machine Design Department has a large collection of modern working drawings furnished by representative builders in this country and abroad, which are kept on file for reference by students.

A collection of kinematic models is displayed in the main lobby. These

were built by Schroeder and by the university shops and are used in the study of mechanism. In addition to these models there are sectional machines consisting of pumps, valves, and gears used to illustrate the design of machine parts. For this purpose the regular shop and laboratory equipment is also regularly employed, the students using this machinery for mechanical drawing models and for comparison in design.

THE FOREST PRODUCTS LABORATORY is a scientific institution engaged in research for the Forest Service, United States Department of Agriculture, in cooperation with the University of Wisconsin. The final objective of the research activities of this organization is to secure maximum economy and efficiency in the production and utilization of forest products with a view to encouraging the practice of forestry. The staff of the laboratory cooperates with that of the University in the courses of lectures and research outlined below. The laboratory offers unusual facilities for research in the field of forest products and possesses very complete scientific and technical equipment for this purpose. In its investigations it approximates closely commercial conditions and cooperates extensively with the various manufacturing establishments in testing out its research on a commercial basis.

The technical investigations of the laboratory are as follows:

(1) Mechanical Properties of Wood. Investigations of strength, stiffness, hardness, and other mechanical properties of commercial woods; effect of treatments on strength; tests on fabricated materials and manufactured articles; the development of grading rules for structural timbers.

(2) Seasoning of Wood. Determination of best methods of air drying and kiln drying to eliminate losses; design and operation of dry kilns; studies of commercial kilns; physical properties of woods.

(3) Shipping Containers. Study of wooden and fiber shipping containers, with special reference to design and specifications to develop containers which will deliver the contents to the consumer in a satisfactory condition at a minimum total cost.

(4) Plywood, Glues, and Laminated Stock. Study of plywood manufacturing problems; strength and design of plywood; development and improvement of glues; study of new uses for laminated construction in commercial work.

(5) By-Products and Chemical Studies. Research on the methods of production and utilization of by-products, such as alcohol, turpentine, rosin, acetate, etc., obtained from various forms of wood and wood waste; and general wood chemistry.

(6) Wood Preservation. Research on fungi which attack structural timbers, with investigations aimed at practical means of prevention; the efficiency of various wood-preserving processes and preservatives.

(7) Pulp and Paper. The suitability of woods and other fibrous materials for pulp, paper, and fiber specialties; studies in the chemistry and engineering of pulping and paper-making processes; chemical and physical studies of pulps and papers.

(8) Silvicultural Relations. Identification of wood; the effect of growth conditions on the structure of wood; and the relation of the structure of wood to its properties; production of naval stores.

(9) Technical Studies of Wood-Using Industries. Study of the economic utilization of wood with a view to eliminating waste; lumber grades and specifications; methods of measuring, manufacturing, and marketing logs, lumber and small dimension stock; development of efficient uses of wood.

The lectures and research are offered by the staff of the laboratory to both undergraduates and graduates. Several courses on various technical activities are given in the Extension Division.

MECHANICAL ENGINEERING COURSE

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (MECHANICAL ENGINEERING)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Math. 51—Elementary analysis	5	Math. 52—Elementary analysis	5
Drawing 1—Elements of drawing	3	Drawing 2—Elements of drawing	3
Chem. 2a—General chemistry	4	Chem. 2b—General chemistry	4
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Shop. 1, 2—Elementary shopwork	2	Shop. 4, 5—Lathe work, planing, milling	2
Physical activity requirement	0	Physical activity requirement	0
Freshman lectures	0	Freshman lectures	0
	17		17

SOPHOMORE YEAR

Math. 54—Differential and integral calculus	4	Math. 55—Calculus	4
Physics 51—General physics	5	Physics 52—General physics	5
Mach. Design 1—Mechanism	4	Drawing 3—Descriptive geometry	3
Shop 6, 13—Tool making and foundry practice	3	Mach. Design 2—Design practice	1
Physical activity requirement	0	Mech. 1, 2—Statics, dynamics	5
		Physical activity requirement	0
	16		18

Summer work, six weeks of industrial practice (see Shop 10).

JUNIOR YEAR

Mech. 3—Mechanics of materials	5	Steam and Gas 22—Elementary testing.	2
Mech. 53—Materials of construction	2	Steam and Gas 2—Thermodynamics	4
Steam and Gas 1—Thermodynamics	4	Hydr. 1—Elementary hydraulics	3
Mach. Design 3—Machine elements	4	Mach. Design 4—Advanced design	4
Shop 7—General shop work	2	Mach. Design 12—Machine testing	2
Elective	3	Elect. Engr. 6—Electrical machinery	3
		Elect. Engr. 56—Direct current laboratory	2
	20		20

SENIOR YEAR

Steam and Gas 105—Calculations	2	Engr. Admin. 106—Power plant economics and design	3
Steam and Gas 23—Advanced testing	2	Engr. Admin. 102—Production and operation	3
Engr. Admin. 101—Construction	3	Steam and Gas 124—Advanced commercial testing	1
Elect. Engr. 7—Electrical machinery	3	Shop 9—Advanced pattern making	1
Elect. Engr. 57—Alternating current laboratory	2	Chem. Engr. 8—Metallography	2
Engr. Admin. 105—Manufacturing and production methods	2	Thesis and electives	9
Electives	5		
	19		19

Electives in the general course outlined above must include Hyd. Engr. 104, Water power, 3 cr., first semester; or Hyd. Engr. 105, Hydraulic machinery, 2 cr., second semester. Also two credits of electives must be selected from the list of advanced courses in Steam and Gas.

It is recommended that the remaining electives be on subjects not closely related to technical engineering work. However, should the student desire to select his electives in the Engineering College, the following are suggested for preliminary consideration:

	Credits per Sem.	
	1st	2nd
Agricultural Engineering	2–3	2–3
City Plan. 101—City planning (repeated)	2	2
Engr. Admin. 103—Corporation reports	2	2
Engr. Admin. 104—Thesis or advanced individual studies	1–5	1–5
Engineering English	1	1
Mining 124—Metallurgy of iron and steel (repeated)	3	3
S and G 100—Senior thesis	1–5	1–5
S and G 106—Steam turbines		2
S and G 108—Heating and ventilating (repeated)	3	3
S and G 109—Internal combustion engines	2	
S and G 110—Advanced heating and ventilating problems	3	3
S and G 112—Refrigeration		2
S and G 128—Heating and ventilating laboratory		2
S and G 130—Internal combustion laboratory		2
S and G 151, 152—Special problems	1–3	1–3
S and G 180—Special reading project	1–3	1–3
S and G 200—Graduate research	3–5	3–5
Struct. Engr. 10—Structural design (repeated)	2	2
Top. Engr. 108—Short course in surveying (repeated)	3	3

ENGINEERING DESIGN GROUP

Mach. Des. 101—Kinematics and dynamics of machinery		2–3
Mech. 106—Advanced strength of materials		3
Mech. 107—Advanced dynamics	3	
Mech. 108—Materials of construction		2
Mech. 109—Graphs		2
Mech. 110—Dynamic stress		2
S and G 114—Theory of heat transfer		2
Math. 110—Higher mathematics for engineers	3	3
Math. 113—Theoretical mechanics	3	3
Math. 250—Theory of elasticity	3	3

Students who wish to select most of their electives from the Engineering Design group should take Math. 110 in the junior year. Hyd. Engr. 1 may be deferred until the senior year.

OPTION IN AERONAUTICAL ENGINEERING

Aeronautics 101—Aerodynamics	3	
102—Airplane stress analysis		3
103—Design of airplane parts	2	
104—Propellor theory		2
108—Welding	2	
109—Airplane engines	2	
110—Aeronautical meteorology		1
130—Airplane engine testing		2

Students who wish to complete the option in Aeronautical Engineering in the senior year must take Aeron. 101 in the first semester of the junior year. Those who take all of the courses listed in this option may substitute non-professional electives for Shop 7, M.D. 12, S and G 105, S and G 124, and E.A. 106. Hyd. Engr. 1 may be deferred until the senior year.

ELECTRICAL ENGINEERING COURSE

GENERAL STATEMENT

The four-year course in electrical engineering leads to the degree of Bachelor of Science (Electrical Engineering) and is open to graduates of accredited high schools and to students entering by examination or with proper credits from other schools and colleges.

The aim of the course is to produce industrious, clear-thinking young men having a working acquaintance with the scientific and economic principles which underlie all engineering practice and a vision of the pleasures and possibilities of continuous growth in engineering service. While engineering practice is kept in view throughout the instruction in the course, this is not for the purpose of conveying a knowledge of the practical details in any one of the many branches of the electrical engineering field. Rather it is for the purpose of imparting an appreciation of engineering methods of procedure.

The successful engineer who develops executive and administrative ability in his technical work eventually assumes an administrative or executive position in which he deals with problems which involve, beside purely technical features, the economic and sociological questions of a civilization which is based so largely upon engineering achievements. To the solution of these problems should be brought the judgment of years of experience founded upon the broadest possible university training. With this in mind, the course in Electrical Engineering has been so framed that a good proportion of the studies are non-professional in nature, i. e., studies not directly connected with the more technical phases of engineering. These are pursued for the most part in the College of Letters and Science. Because of the wide latitude of choice permitted, students are urged to give careful consideration, early in their course, to the planning of a worthwhile group of these non-professional studies the election of which usually begins in the second semester of the sophomore year.

It is further recommended that students who aim to lay the broadest foundation for constructive leadership devote more than four years to their college work, combining with their engineering studies a liberal selection of studies outside the College of Engineering.

All class room work in electrical theory is paralleled by work in the well-equipped laboratories in which the students, working in pairs, acquire a working knowledge of electrical instruments and machines by carrying out tests which illustrate the engineering applications of the principles studied in the class room. In all of the electrical work, special effort is directed toward training the initiative and the independent powers of thought of the students, so that they may truly make themselves masters of the principles studied, and may thereby lay the foundation for creative professional work. To develop initiative, students are urged, in the senior year, to elect and submit reports on one or more engineering problems requiring analytical investigative work. The studies may be of an economical, historical, statistical, theoretical, or experimental type. Studies of unusual merit are filed as theses in the University Library.

According to their interests and aptitudes, the men who are graduated from this course engage in the following types of electrical engineering work: research, design, maintenance, operating, construction, and sales engineering. The majority enter the employment of corporations owning electric lighting, electric railway, electric power transmission, or telephone plants (with the expectation of ultimately becoming superintendents, chief engineers, managers, or owners), the employment of contractors for the construction of electrical plants, or the employment of manufacturers of electrical and allied machinery. A considerable number of the graduates are now found in administrative and teaching positions in the engineering colleges.

GRADUATE STUDENTS. Graduates are offered instruction in advanced theory, design, and experimental investigation relating to the several branches of applied electricity. Students who are candidates for the doctor's or master's degree are offered all the reasonable facilities for carrying on either their major or minor elections in the Electrical Engineering Department. The regulations relating to these degrees are enumerated on another page of this bulletin.

The organization of the department is arranged to afford adequate supervision to advanced students who are carrying on the investigation of original problems, and excellent facilities are offered to such students in the way of laboratory rooms and of special apparatus constructed by the college mechanicians.

EQUIPMENT

THE DYNAMO LABORATORY. The transforming and converting machinery which furnishes the electrical power for all the electrical laboratories is located in the dynamo laboratory. The electrical power for these laboratories is transmitted from the electrical substation of the University to the necessary transforming and motor-generator equipment for furnishing power at the following voltages and frequencies: Three-phase power at 110 volts and 25 and 60 cycles; and direct current power at 110, 220 and 500 volts.

The dynamo collection consists of a large number of continuous current and alternating current dynamos and motors of different types and sizes. Shunt, series, and compound, continuous current generators and motors; single, two- and three-phase alternating current generators; single-phase and three-phase induction motors; synchronous motors and converters; single-phase commutator type motors and transformers are supplied in various sizes.

The equipment comprises more than fifty dynamos for exclusive laboratory use for the purpose of instruction and experiment. All apparatus necessary for the accurate testing of dynamos is available. Large lamp banks, water rheostats, and transformers for loading generators; special prony brakes and electric dynamometers, for loading motors; and an unusually complete assortment of the well-known types of ammeters, voltmeters and wattmeters for making accurate electrical measurements are supplied.

STANDARDS LABORATORY. Instructional work in courses dealing with electrical instruments and meters and the official standardizing work for the Railroad Commission of Wisconsin are carried on in this laboratory. The laboratory equipment includes a complete duplicate set of standard resistance units and a group of standard cells which are periodically used in connection with the Wolff potentiometer to calibrate the secondary or working standard instruments. The working standard instruments include numerous Weston, Westinghouse, General Electric and Simens-Halske precision and portable ammeters, voltmeters, wattmeters, and a Brooks deflection potentiometer.

Specialized equipment, such as Wheatstone bridges, a Kelvin double bridge, and a Per Cent bridge accurate to within 0.01%, are available for special and precise resistance measurements. For unusual measurements with instruments, power factor meters, frequency meters, low range ammeters, voltmeters, wattmeters and low power factor wattmeters are available. Variable speed motor-generator sets operated in conjunction with a 120 volt storage battery furnish power at any frequency between 10 and 150 cycles. A motor-generator set and a Seth-Thomas clock and relay timing system are part of the permanently installed equipment for accurately testing portable standard watthour meters.

Equipment suitable for field tests includes stop watches, wattmeters, ammeters, voltmeters, power factor meters, cycle counter, synchronous timer, frequency meters, portable standard a. c. and d. c. watthour meters, phase shifting transformer and voltage regulator, Silsbee current transformer testing set, standard current and voltage transformers, and a Westinghouse three-element oscillograph.

Photometric Laboratories. These laboratories comprise a number of rooms especially arranged for the study and testing of lamps and light sources of various kinds. The equipment includes a complete set of photometric standard lamps, a 300-cm. photometer bar, a 500-cm. photometer bar equipped with a single mirror selector, a 72" Ulbricht spherical photometer, portable photometers, a Lummer-Brodhun spectro-photometer and numerous auxiliary equipment, such as sight boxes of the Bunsen, Lummer-Brodhun, and flicker types, rotating sectored discs and absorption screens.

High Tension Laboratory. The high tension equipment comprises a 50,000-volt, 20-kw. and a 300,000-volt transformer, and an induction regulator permitting the voltage to be gradually varied from zero to 300,000 volts, needle and sphere gaps for measuring high voltages, facilities for testing insulators under wet weather conditions, and general facilities such as vibrator type and cathode ray oscillographs, for routine tests or special researches upon insulating materials.

Communications and Circuits Laboratory. Under telephone equipment may be listed: demonstration panels and sets containing all the elements from one subscriber's telephone set through two exchanges to a second subscriber's station, an artificial telephone line having a length of several wave lengths, duplex telegraph sets, a repeating station, loading coils and wave models which show the distribution of current and voltage along long lines, alternating current bridges and voltmeter-ammeter amplifiers.

The radio equipment comprises the necessary facilities for setting up and carrying on studies relating to sending and receiving sets, such as a stock of receiving and power tubes, inductances, condensers, high voltage generators, wave meters, oscillators, and many signal corps sets supplied by the government for use in the signal corps courses. The university broadcasting station, which is under the supervision of the department, presents an opportunity for the study of some of the problems of radio transmission and reception.

For the study of transient phenomena, sychronous switching devices have been constructed which permit of viewing transient wave forms on the oscillograph screen.

For general research work, there are available four modern vibrator type oscillographs, two cathode ray oscillographs, electrical measuring instruments of all types, various types of vacuum pumps, chemical apparatus, etc.

An excellent mechanician's department is maintained by the College of Engineering to construct and repair apparatus for the research and instructional work of the college.

These facilities, together with a liberal research fund, make important and effective research work possible.

ELECTRICAL ENGINEERING COURSE

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (ELECTRICAL ENGINEERING)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Math. 51—Elementary analysis	5	Math. 52—Elementary analysis	5
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Drawing 1—Elements of drawing	3	Drawing 2—Elements of drawing	3
Shop 11 or Speech 8	2	Speech 8 or Shop 11	2
Chem. 2a—General chemistry	4	Chem. 2b—General chemistry	4
Physical activity requirement	0	Physical activity requirement	0
Freshman lectures	0	Freshman lectures	0
	17		17

SOPHOMORE YEAR

Math. 54—Differential and integral calculus	4	Math. 55—Calculus	4
Physics 53—Mechanics and heat	3	Physics 54—Electricity, magnetism and sound	3
Drawing 3—Descriptive geometry	3	Elect. Engr. 1—Electrodynamics	4
Econ. 1a—General economics	4	Elect. Engr. 51—Electrodynamics lab.	2
Elective—Top. Engr. 108 recommended	3	Shop 12—Advanced shop work	2
Physical activity requirement	0	Non-professional elective	3
	17	Physical activity requirement	0
			18

Six weeks of approved summer experience in an engineering industrial organization, to be taken following either the sophomore or the junior year.

JUNIOR YEAR

Mech. 1, 2—Statics, dynamics	5	Mech. 3—Mechanics of materials	5
Physics 55—Adv. electricity, magnetism	3	Steam and Gas 4—Thermodynamics	3
Steam and Gas 3—Thermodynamics	3	Steam and Gas 28—Elementary testing	2
Elect. Engr. 2—Direct current machinery	4	Elect. Engr. 3—Alternating current circuits and machinery	4
Elect. Engr. 52—Direct current laboratory	2	Elect. Engr. 53—Alternating current lab.	2
Non-professional elective	3	Non-professional elective	3
	20		19

SENIOR YEAR

Elect. Engr. 4—Alternating current machinery	4	Physics 56—Adv. electricity and light	3
Elect. Engr. 54—Alternating current lab.	2	Contracts 101—Contracts and specifications	2
Steam and Gas 29—Advanced testing	1	or	
Hydr. 1—Elementary hydraulics	3	Engr. Admin. 102 or 106	(3)
Mech. 53—Materials of construction	2	Elect. Engr. 25—Seminar	2
or		or	
Elect. Engr. 25—Seminar	(2)	Mech. 53—Materials of construction	(2)
Electives	7	Mach. Design 5—Machine elements	3
	19	Electives	9-8
			19

ELECTIVES

Of the 28 elective credits,—

10 may be elected without restriction.

12 must be elected in subjects which are non-professional in the sense that they are not prerequisite to the more technical phases of engineering work,—in subjects such as economics, political science, history, literature, languages, logic, ethics, psychology, philosophy, sociology, geology, and the like.

6 must be selected from the following group of electrical applications:

First Semester		Second Semester	
E. E. 116—Electric circuits	3	E. E. 104—Electrical machine design	3
E. E. 122—Electric meters	3	E. E. 120—High tension insulation	3
E. E. 137—Power distribution	3	E. E. 127—Central stations	3
E. E. 154—Elements of radio communication	3	E. E. 133—Illumination and photometry	3
E. E. 155—Thermionic vacuum tube circuits	3	E. E. 156—Elements of wire communication	3
E. E. 160—Advanced individual studies*	3-5	E. E. 157—Radio circuit analysis and design	3
E. E. 213—Electric machine theory	3	E. E. 160—Advanced individual studies*	3-5
		E. E. 214—Advanced dynamo laboratory	3
		E. E. 232—Advanced electric circuits	3

*Must receive the approval of the E. E. Course Committee

CHEMICAL ENGINEERING COURSE

GENERAL STATEMENT

Industrial development generally and that in the chemical industries particularly has made chemical engineering one of the important branches of the engineering profession. There is now a demand for men having a combined engineering and chemical training. To satisfy this demand the four-year course in Chemical Engineering has been arranged, leading to the degree of Bachelor of Science.

The variety of industries is most comprehensive in which the chemical engineer now generally finds employment. Among these may be mentioned the by-product coke and gas industry and its intimate connection with the manufacture of dyestuffs; the production of paper and chemical pulp; the hardening of vegetable and animal oils into valuable foods; the refining of crude petroleum into gasoline, lubricating oils, and waxes; the manufacture of iron and steel, brass, and alloys; the sulphuric acid and alkali industry; and the construction of machinery and equipment for chemical plants. The electrochemical industries for the refining of copper, the production of caustic soda and chlorine, and the electroplating of metals for prevention of corrosion have been firmly established. The use of the electric furnace for making steel, brass, and alloys has led to revolutionary changes in these industries.

The graduate usually begins his work as a cadet engineer in the operating or research departments; as a chemist in the laboratory; or in the sales organization. His goal is frequently an executive position in a corporation or in his own business; or he may do consulting work after having gained the necessary experience.

Because the field of chemical engineering is so comprehensive, the training of men for this work must be along broad lines. Besides the required technical courses, instruction in the departments of economics, accounting, and English should be elected by the student, because training in such studies is a most valuable asset. To train men in the technical details of any branch of chemical engineering is not the purpose of the course, since the technique of an industry can best be acquired in subsequent practice. The purpose of the course is to offer instruction in those fundamental subjects which are essential to the chemical engineer in whatever line he may folllow.

EQUIPMENT

All of the Chemical Engineering Building is devoted to the laboratories, classrooms and offices of the Department of Chemical Engineering. The building, 45 feet wide by 125 feet long, comprises a high basement and two floors with a commodious attic.

Gas and Fuel Laboratory. Bomb calorimeters of various types are available for testing the heating values of coal and oil; gas calorimeters together with the necessary meters, scales, and water tanks are also provided. The equipment for gas analysis, for testing of lubricating and road oils, and for distillation of petroleum products is complete.

Pyrometry Laboratory. The pyrometric laboratory is well supplied with base metal and platinum thermocouples, resistance thermometers, and optical and radiation pyrometers for the measurement of high and low temperatures. The equipment includes precision potentiometers and Wheatstone bridges for highly accurate measurements. The furnaces are electrically heated and for accurate con-

trol there are ample transformers and reactance coils. The facilities are well adapted for instruction in temperature control and measurements under industrial conditions.

METALLOGRAPHY LABORATORY. Besides the general laboratory for preparing the metal specimens for microscopic examination, there is a photographic dark room for developing negatives and making prints. The microscopes for student use are of a high grade and are provided with attachments for photographing; for research there are larger microscopes capable of high magnification. Accessory apparatus such as furnaces for heat treatment, pyrometers, polishing apparatus, and quenching devices are also provided.

CHEMICAL FACTORY LABORATORY. About one-half of the basement is devoted to chemical manufacture and tests on machinery. A complete laboratory with balance room on the first floor is provided for chemical analysis. Among the important pieces of apparatus are: two rectifying stills each of 20 gallons capacity, three plain oil stills of 10 to 15 gallons capacity, 3 filter presses, a single effect vacuum evaporator, a vacuum drying oven, pressure digester, two hydraulic presses, one of 40 tons maximum pressure, an autoclave of 5 gallons capacity, and crushing and grinding machinery. Besides these there are the necessary wooden, metal and stoneware tanks, basket centrifugal machine, drying oven, furnaces of the muffle, crucible, and reverberatory type, and other desirable appliances to conduct experiments on a semi-factory scale.

ELECTROCHEMISTRY LABORATORY. The general laboratory for electrochemistry is well equipped with tanks, stirring devices, indicating and recording ammeters and voltmeters, instruments for measuring resistances. Either alternating or direct current is available at the desk of each student.

For instruction in electroplating, refining and electrotyping, the equipment comprises polishing lathes, a motor dynamo, and a storage battery. Tanks of wood, enameled iron, and stoneware, with a capacity from 30 to 60 gallons, are provided for plating and cleaning solutions.

ELECTRIC FURNACE LABORATORY. The electric furnace room for alternating current contains resistance and arc furnaces for general purposes, a vacuum furnace of the Arsem type, a Girod steel furnace having a capacity of 100 pounds of metal, and a rotating brass furnace of about 100 pounds capacity. There is available for the exclusive use of this laboratory the power from three transformers each of 75 k. v. a. which may be had continuously.

LABORATORY FOR INDUSTRIAL MICROSCOPY. A large, well-lighted room on the third floor is provided specially for the instruction in industrial microscopy. Petrographic and chemical microscopes and many useful accessories are available for the study and identification of textiles, pulp and paper, paint, refractories, leather, etc. A separate chemical laboratory is provided for the preparation of samples.

FOREST PRODUCTS LABORATORY. The United States Forest Products Laboratory is operating in cooperation with the University of Wisconsin. The work carried on in this laboratory is largely of a chemical engineering nature dealing with the preservation of timber, manufacture of paper, utilization of wastes, and the like. The management of this laboratory provides that chemical engineering students may undertake investigation using the Forest Products Laboratory equipment, so far as such does not interfere with their own work.

CHEMICAL ENGINEERING COURSE

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (CHEMICAL ENGINEERING)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Math. 51—Elementary analysis	5	Math. 52—Elementary analysis	5
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Drawing 1—Elements of drawing	3	Drawing 2—Elements of drawing	3
Shop 1, 2—Elementary shopwork	2	Shop 4, 5—Lathe work, planing, milling	2
Chem. 2a—General chemistry	4	Chem. 2b—General chemistry	4
Physical activity requirement	0	Physical activity requirement	0
Freshman lectures	0	Freshman lectures	0
	17		17

SOPHOMORE YEAR

Math. 54—Differential and integral calculus	4	Math. 55—Calculus	4
Chem. 14—Quantitative analysis	5	Mech. 1, 2—Statics, dynamics	5
Physics 51—General physics	5	Physics 52—General physics	5
Mach. Design 1—Mechanism	4	Chem. Engr. 12—Technical examination of fuels, gases, water	2
Physical activity requirement	0	Chem. Engr. 18—Fundamentals of chemical engineering	2
	18	Physical activity requirement	0
			18

JUNIOR YEAR

Mech. 3—Mechanics of materials	5	Steam and Gas 4—Thermodynamics	3
Steam and Gas 3—Thermodynamics	3	Steam and Gas 25—Elementary testing.	2
Chem. 120—Organic chemistry	3	Chem. 120—Organic chemistry	3
Chem. Engr. 117—Technical pyrometry	2	Chem. Engr. 111—Manufacturing operations	4
Chem. Engr. 119—Metallography	3	Mech. 54—Materials of construction	2
Elective (Economics recommended)	3	Electives	5
	19		19

Summer work, Chemical Engineering 114, Chemical manufacture, 4 cr.

SENIOR YEAR

Steam and Gas 26—Advanced testing	1	Engr. Admin. 101—Construction, or	2
Elect. Engr. 8—Electrical machinery	3	Contracts 101—Contracts and specifications	(2)
Mach. Design 5—Machine elements	3	Chem. Eng. 116—Thermal processes of chemical engineering	2
Chem. Engr. 101—Applied electrochemistry	5	Chem. Engr. 115—Industrial chemistry	2
Chem. Engr. 115—Industrial chemistry	3	Chem. Engr. 122—Special problems	4
Chem. Engr. 116—Thermal processes of chemical engineering	2	Chem. 30—Physical chemistry	3
Elective	2	Elect. Engr. 9—Electrical machinery	3
	19	Elective	3
			19

MINING ENGINEERING COURSE

METALLURGICAL ENGINEERING COURSE

GENERAL STATEMENT

The courses in mining, metallurgy, and geology are offered for students who intend to enter any branch of the mineral industry, and they are also recommended to those desiring an engineering or broad technical training.

The regular four-year courses in mining and geology leading to the degree of Bachelor of Science (Mining Engineering) and the four-year course in metallurgy leading to the degree of Bachelor of Science (Metallurgical Engineering), are open to graduates of accredited high schools, and are fully outlined below.

While not required from undergraduates for graduation, a thesis upon some suitable subject may be submitted by students who have an interest in research. This thesis will replace an equivalent amount of work regularly required for graduation.

The degrees Master of Science (Mining Engineering) and Master of Science (Metallurgical Engineering) are conferred upon graduates of this and other approved institutions upon completion of one year's work in residence and the submission of a satisfactory thesis. The professional degrees, Engineer of Mines and Metallurgical Engineer, are granted to graduates of the College of Engineering, University of Wisconsin, who have completed five years of professional work in their respective fields and have submitted a satisfactory thesis. For a detailed statement of the requirements for the degree see Graduate School.

A survey of mineral production and the metallurgical industries in the state and in adjacent territory in what might be called Wisconsin's sphere of influence shows it to be located near the greatest reserves of iron ore in the world, on the one hand, and, on the other, are the great blast furnaces and rolling mills, foremost among the world's steel producers. Wisconsin is also located between the copper producing district and the zinc lead district, which are among the oldest mining districts in the United States. As a foundry state, Wisconsin occupies a unique position among American states for its gray iron foundries, for malleable iron foundries, for steel foundries, and for electric steel foundries. In the manufacture of various lines of mining, smelting, and power machinery, Wisconsin is one of the leaders of the world.

The United States is the preeminent mining nation of the world, producing 40 per cent of the mineral production of the world. The mineral production of the world has increased very much in recent years, the output since the year 1900 equalling the total production in all past history up to that date. With this increase in production, the need for technical knowledge and the demand for technically trained mining engineers, metallurgists, and geologists has correspondingly increased. These fields are now the youngest and most rapidly growing branch of engineering, and education in them should fullfill certain needs of the industry in the state, and within the immedate region of Wisconsin influence. It should have that broad general basis, as well as detailed technical application to make it best play its part in the future commercial expansion of the United States into foreign fields. It has been said that university education is to promote leadership in the state, leadership in the nation, leadership in the world's affairs, and to give to the individual the greatest opportunity for advancement. In addition he must have the basic general and technical training of an engineer. He must make a study of the technical and industrial problems of his profession, and he should also broaden himself by a study of the problems of the state and the nation as well as by the study of man.

To give the specialized training to carry out the scheme outlined above, the Department of Mining and Metallurgy organized in the College of Engineering, in conjunction with the Department of Geology of the College of Letters and Science, takes up the specialized work which follows the thorough fundamental training which is the first essential of a successful engineer.

The location of a technical school at a great university has many advantages which cannot be duplicated. It has all the resources of personnel and equipment for instruction and research; it has the advantages of access to great libraries and laboratories, all of which offer facilities that only a great university can maintain. It has the advantages of cooperation with strong independent departments in geology, chemistry, physics, mathematics, mechanics, civil, electrical, chemical, and mechanical engineering, English, foreign languages, commerce, economics, and various other subjects which are of vital importance to the mining engineer. The University of Wisconsin is fortunate in the possession of exceptional facilities in all of these lines. As a result, the Department of Mining and Metallurgy is enabled to concentrate all of its effort on and to specialize in its particular fields, and outlines and directs the work of its students in allied subjects. The contact of the student with the larger and broader interests at a university enlarges his outlook on life in general.

EQUIPMENT

The new Mining and Metallurgy Building is fire-proof and contains about 28,000 sq. ft. of laboratory floor space. The first floor contains a crushing and screening room, ore dressing room, the ceramics department, and a room housing the physical testing apparatus. These, together with a lecture room and a wash room, form the central section of this floor. On the west end is the large room devoted to physical metallurgy containing the various laboratory furnaces and accessory apparatus. On the east end a similar room houses the larger furnaces selected for class demonstration in industrial practice.

On the second floor are found the various physical and chemical laboratories, the lecture rooms, and the faculty offices. The central section contains a temperature standards laboratory, a pyrometer laboratory, an electrolysis laboratory, and a three-room suite for the polishing and metallographic examinations of metals. The photographic dark room completes the latter unit. In addition, there are three offices and a lecture room. On the west end is found a lecture auditorium, a museum, a graduate seminar room, and the office of the chairman of the department. On the east end is the large lecture room, the chemical laboratory, the balance room, the chemical stores room, and an office.

The fire-assay equipment consists of a large gas furnace together with suitable electric furnaces for cupelling and scorifying. The furnace room contains an oil-fired stationary hearth reverberatory furnace, an oil-fired roasting furnace, an oil-fired tilting reverberatory furnace, a copper and lead blast furance, and a gas-fired tilting copper reverberatory furnace. The room devoted to physical metallurgy contains various electric and gas-fired furnaces, both crucible and hearth type. In addition there is a Haskins plate resister furnace, a 35 K.V.A. high-frequency furnace, and a single-phase tilting electric furnace of 150-pound capacity. The physical testing laboratory will contain equipment for the static and dynamic testing of materials. The ceramics laboratory contains a muller, a manually-operated brick machine, clay auger machines, pug mill, an oil-fired down-draft kiln, and additional apparatus for the complete demonstration of the properties of clay. In the metallurgical suite is found a Leitz micro-metallograph, small metallurgical microscopes, a Warner-Swasey polishing table, and a

well-equipped and modern dark room. The chemical laboratory contains the usual laboratory tables and hoods with adjacent store room and balance room.

Apparatus for advanced students in special research problems is provided and maintained.

The crushing room contains laboratory crushers of the jaw and gyratory types for fine crushing, disc and ball grinders, and rolls. Ore bins are conveniently located for crushing tests.

Dry screening is done by hand, by mechanical apparatus, and by the trommel screens in the ore-dressing laboratory.

The ore-dressing laboratory contains a large jaw type crusher, a large set of rolls, bucket elevators, trommel screens, jiggs of Woodbury, Hartz, and Richards pulsator type, Wilfly and Diester tables, a Ding and a Grondal magnetic separator. Each machine is an independent unit provided with ample head room to permit sampling its feed and products, and with pipe and launder systems and pumps and elevators to return these products for continuous treatment when desired. Classifiers and settling and de-watering cones are provided so that various units may be grouped and large lots of ore tested under milling conditions when this is desirable.

Equipment for advanced research along various hydro-metallurgical lines is also provided.

For testing gold and silver ores a battery of two 850-pound stamps is available, together with amalgamating tables and laobratory leaching apparatus. In process testing, initial classroom testing is performed and small lots of ores are tested in small equipment to determine methods best adapted to their successful treatment. For this purpose small-scale laboratory jiggs, tables, classifiers, and flotation equipment together with laboratory leaching apparatus are available. For the rapid examination of ore-dressing products microscopes are provided.

The mining museum contains models of separate types of surface and underground mine structures, mine models, and the various types of rock drills used in mining and quarry practice.

In the metallurgical museum there is an extensive exhibit of castings illustrating quality of product, gating, and the use of risers. Another series illustrates defects in castings. Samples of all foundry material are included. The collection of iron blast-furnace slags with the operating data under which they were produced is probobly the most complete in the United States.

COURSES IN MINING AND GEOLOGY

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (MINING ENGINEERING)

AND

COURSE IN METALLURGY

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (METALLURGICAL ENGINEERING)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Math. 51—Elementary analysis	5	Math. 52—Elementary analysis	5
Drawing 1—Elements of drawing	3	Drawing 2—Elements of drawing	3
Chem. 2a—General chemistry	4	Chem. 2b—General chemistry	4
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Shop. 1, 2—Elementary shopwork, or	2	Shop 4, 5—Lathe work, planing, milling	2
Top. Engr. 108—Short course in surveying	(3)	or Mining 12—Mine surveying	(2)
Physical activity requirement	0	Physical activity requirement	0
Freshman lectures	0	Freshman lectures	0
	17-18		17

SOPHOMORE YEAR

Math. 54—Differential and integral calculus	4	Math. 55—Calculus	4
Physics 51—General physics	4	Physics 52—General physics	4
Chem. 14—Quantitative analysis	5	Drawing 3—Descriptive geometry	3
Geol. 9—Engineering geology	3	Geol. 9—Engineering geology	3
Mining 101—Excavation and tunneling	3	Mining 121—Assaying	3
Physical activity requirement	0	Mining 122—General metallurgy	3
		Physical activity requirement	0
	19		20

In order to best prepare the student for specialized work in one of the three special fields—mining, metallurgy, or economic geology—three options are offered from which he may select his major and minor studies at the beginning of his junior year.

The major is to consist of 30-40 credits from one of the three groups listed below.

The minor is to consist of 15-20 credits from either other group. No minor studies may be selected from the major group.

MINING GROUP.

Mining and Metallurgy 103, 104, 105, 106, 107, 108, 109, 126.
Railways 104, Structural Engr. 10, Steam and Gas Engr. 3 and 4.
Electrical Engr. 8 and 9, Hydraulics 1, Geology 113, 115.
Economics 1a, 1b, 5, 137.

METALLURGY GROUP.

Mining and Metallurgy 122, 123, 124, 125, 126, 127, 128, 130, 131, 132, 135, 140, 145.

Structural Engr. 10, Steam and Gas. Engr. 3 and 4, Electrical Engr. 8 and 9. Chemical Engr. 102, Economics 1a, 1b, 5, 137.

GEOLOGY GROUP.

The courses in Geology; Mining and Metallurgy 101, 103, 104; 107, 109, 124.

Typical junior and senior year elections are shown below for each of the three options. These outlines are suggestive only and other courses may be carried within the general rule of major, minor, and free electives.

MINING OPTION

SUGGESTED SEQUENCE

JUNIOR YEAR

Mech. 1, 2—Statics, dynamics	5	Mech. 3—Mechanics of materials	5
Geol. 6—Mineralogy	5	Mech. 53—Materials of construction	2
Mining 103—Mining methods	3	Geol. 6—Mineralogy	5
Geol. 114—Structural geology	3	Mining 103—Mining methods	3
*Mining 123—Metallurgy of copper, lead and zinc	(5)	Mining 127—Hydrometallurgy of gold and silver	5
†Geol. 114—Structural, Lab.	2		
	18		20

Note:—*For students taking metallurgy minor.
†For students taking geology minor.

SENIOR YEAR

Mining 124—Metallurgy of iron and steel	3	Mining 109—Mine and smelter administration	3
Mining 107—Ore dressing	5	Mining 104—Mine valuation	3
Elect. Engr. 8—Electrical machinery	3	Struct. Engr. 10—Structural design	2
Struct. Engr. 10—Structural design	2	Mining 105—Mine engineering	3
Mining 105—Mine engineering	3	Elect. Engr. 9—Electrical machinery	3
Minor and electives	3	Minor and electives	5
	19		19

NOTE—Preferably at the end of the junior year those taking the Mining option are required to take a six-week inspection trip in the mining districts while those taking the Metallurgical option take a similar trip to the metallurgical centers.

METALLURGY OPTION

SUGGESTED SEQUENCE

JUNIOR YEAR

Mech. 1, 2—Statics, dynamics	5	Mech. 3—Mechanics of materials	5
Mining 123—Metallurgy of copper, lead, and zinc	5	Mech. 53—Materials of construction	2
Mining 124—Metallurgy of iron and steel	3	Mining 127—Hydrometallurgy of gold and silver	5
Mining 145—Phase rule applied to metallurgy	3	Chem. 30—Physical chemistry	3
Minor and electives	3	Minor and electives	4
	19		19

SENIOR YEAR

Mining 107—Ore dressing	5	Mining 109—Mine and smelter administration	3
Mining 140—Heat treatment of low and medium carbon steel	2	Chem. Engr. 102—Electric furnaces	4
Mining 135—Thermodynamics of metallurgical reactions	3	Elect. Engr. 9—Electrical machinery	3
Mining 125—Metallurgy of minor metals	3	Mining 130—Physical chemistry of the metals	3
Elect. Engr. 8—Electrical machinery	3	Mining 131—Foundry metallurgy	2
Chem. Engr. 119—Metallography	3	Mining 135—Thermodynamics of metallurgical reactions	3
	19		18

GEOLOGY OPTION

SUGGESTED SEQUENCE

JUNIOR YEAR

Mech. 1, 2—Statics, dynamics	5	Mech. 3—Mechanics of materials	5
Geol. 6—Mineralogy	5	Mech. 53—Materials of construction	2
Geol. 114—Structural geology	5	Geol. 6—Mineralogy	5
Mining 103—Mining methods	3	Mining 103—Mining methods	3
Geol. 117—Pre-Cambrian geology	2	Geol. 115—Metamorphic geology	5
or		or	
Geol. 150—Economic aspects	(2)	Geol. 151—Geology of mineral deposits	(5)
	20		20

SENIOR YEAR

Mining 107—Ore dressing	5	Mining 104—Mine valuation	3
Mining 124—Metallurgy of iron and steel	3	Mining 109—Mine and smelter administration	3
Geol. 108—Petrology	5	Geol. 108—Petrology	5
Geol. 117—Pre-Cambrian geology	2	Geol. 115—Metamorphic geology	(5)
or		or	
Geol. 150—Economic aspects	2	Geol. 151—Geology of mineral deposits	5
Minor and electives	4	Geol. 148—Tectonic geology	(1)
	19	or	
		Geol. 149—Methods of mineral exploration	2
			18

ENGINEERING EXPERIMENT STATION

The Engineering Experiment Station of the College of Engineering was established by action of the Board of Regents, March 4, 1914. The members of the engineering faculty, together with fellows, scholars, and special assistants, devoting their time to research, constitute the members of the staff of the Experiment Station.

The purpose of this Experiment Station is the promotion of the engineering and industrial interests of the State by the scientific study of problems relating thereto as far as the facilities of the engineering laboratories will permit. So far as may be, the subjects for experimental study are selected with reference to their importance to the state of Wisconsin, although generally the problems are of wider interest and importance.

The establishment of this department brings together into definite organization the research which has been conducted for many years in the College of Engineering. It is expected that by this means such work will be more systematically developed and come to be of greater value to all interests concerned. The results of the research done in the past have appeared in part in papers before technical societies, and in part in the Engineering Series of the University Bulletin. Up to date more than seventy such bulletins have been published. A list of the bulletins already published may be had upon application to the University Editor.

In the fields of hydraulic and sanitary engineering, bulletins are published from time to time giving the results of studies of stream flow and other conditions affecting water supply and water power. Bulletins are also issued giving the results of experimental studies in the laboratory on hydraulic machines, apparatus for the measurement of flow of water, and the losses which occur when water flows through pipes and other passages. Investigations now in progress include a study of the variations of stream flow as affected by rainfall, the effect of standing wave in undermining the downstream foundation of dams, the comparison of losses in various pipe bends, the resistance to flow in locomotive water columns and the relief from water hammer pressure caused by closure of the valves, the discharge coefficients of submerged weirs of various heights and types of crests, pipe friction studies in wrought iron pipes of long lengths and large diameters, coefficients of discharge of standard triangular weirs and triangular weirs when placed on the end of circular conduits, and studies of the performance of different types of rotary pumps.

In the sanitary field studies are being made on the purification actually effected by modern sewage disposal plants. In cooperation with the State Board of Health, investigations are being made of pea cannery wastes and creamery wastes.

In the Materials Testing Laboratory, experiments have been conducted for several years on various features of reinforced concrete design. At the present time further tests are being made on the permeability, durability, and other properties of concrete. Tests are in progress on friction in line shaft bearings, on temperature stresses in reinforced concrete chimneys, on steel columns under eccentric loads, on flat plates and cylindrical tanks, on fatigue of brasses, steel and cast iron, and on steels subjected to prolonged constant strain. The laboratory is cooperating with the Materials Department of the State Highway Commission; also with national engineering societies in studies of materials of construction.

The Steam and Gas Department of Mechanical Engineering has published information relating to the heat insulating properties of commercial pipe coverings, the economical combustion of soft coal, the Pitot tube as an instrument for measuring the flow of gases; besides a number of bulletins covering heating and

ventilating subjects. These papers cover the study of recirculation of washed air for ventilating purposes, the direct transmission of heat from steam to hot water for heating purposes, complete engineering service data for a large hospital, and the infiltration of air into buildings through windows and through various types of wall construction. The infiltration work is being carried on in cooperation with the American Society of Heating and Ventilating Engineers.

In the Department of Electrical Engineering studies and experimental investigations have been made pertaining to the flow of heat through cable insulation, electrical records for mechanical stresses, electrical methods of geophysical exploration, the radiating and receiving properties of radio antennas, the measurment of the constants of radio apparatus and receiving sets, inductive effects between power and telephone circuits, the nature of failure in insulating materials, speed variation and power factor correction in induction motors, and the theory of transient phenomena in electric networks.

A Standards Laboratory is operated in connection with the work of the Wisconsin Railroad Commission and the State at large, testing and standardizing electrical metering devices of all kinds. Through this laboratory, the facilities of the Electrical Laboratory have been made available to the industries of the State for tests and investigations which require the use of instruments not ordinarily possessed by the industries. The following tests indicate the nature of the work conducted for the industries: oscillograph tests of magnetos, ignition coils and circuit breakers, acceptance test of transformers for ratio, regulation and efficiency, certification of ratio and phase angle of current transformers, tests on insulators, insulating materials, and cables, tests of lamps and magnetic materials.

The researches in the Chemical Engineering Department include: the measurement of the temperature of hot flowing gas, the aeration of industrial gas burners, the liberation of ammonia from solutions by various commercial limes, the transfer of heat in tubular gas condensers, the case hardening of steel with manufactured gas, the methods of analysis of cooking liquor for Kraft pulp, the electroplating of chromium, and the mechanism of extraction or solution of soluble salts by water.

Research is being carried on in the field of Mining and Metallurgy by that department. The treatment of zinc ores by flotation concentration methods and electrolytic recovery methods, developed in our laboratories, offers considerable economic possibilities in the treatment of low grade ores with higher recoveries than are now possible. The constitution and physical properties of iron blast furnace slags are being studied. A grant from the Engineering Foundation is facilitating progress in this work. With the assistance of different groups of founderies in Wisconsin, research on the properties of gray cast iron, the reactions of steel-making, and the manufacture of pearlitic iron is being instituted. From time to time the department cooperates with individual enterprises in studies of the special problems which their work develops.

For further information regarding the Engineering Experiment Station, address F. E. TURNEAURE, *Director*.

DEPARTMENTS OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
I, II—semester course given each semester
cr—number of credit hours per semester
*—to be arranged

Courses numbered under 100 may be credited only by undergraduates; those in the 100-group may be credited by both undergraduates and graduates; those in the 200-group are ordinarily open only to graduates.

The unit of reckoning the credit is one hour of classroom work per week. Two hours of drawing, laboratory, field, or shop work (which require little outside preparation) count as one hour of classroom work.

AERONAUTICS

Raymond Jefferson Roark, M.S., C.E., *Associate Professor of Mechanics*
Leroy Alonzo Wilson, M.E., M.M.E., *Associate Professor of Steam and Gas Engineering*
Grover C. Wilson, M.S., M.E., *Assistant Professor of Steam and Gas Engineering*
Eric Rexford Miller, M.S., *Lecturer in Meteorology.*
Richard Scheunemann Hartenberg, B.S., *Instructor in Mechanics*
Charles Frederick Peters, *Instructor in Mechanical Practice*
Robert Nicholas Schumann, *Instructor in Mechanical Practice*

101. Aerodynamics. I; 3 cr. The wind tunnel, properties of airfoils and of combinations, and parasitic resistance; also airplane controls and propellers; stability and performance. Prerequisite: Mechanics 2. Mr. Hartenberg.

102. Airplane Stress Analysis. II; 3 cr. Stress analysis of airplane structures with special reference to Department of Commerce requirements. Prerequisites: Aeronautics 101 and Mechanics 3. Mr. Roark.

103. Design of Airplane Parts. I; 2 cr. Design of spars, struts and other structural elements. Aircraft materials. Prerequisite: Aeronautics 102. Mr. Roark.

104. Propeller Theory. II; 2 cr. Theories of propeller performance; practical methods of design. Prerequisite: Aeronautics 101. Mr. Roark.

108. Welding. I; 2 cr. Arc and gas welding, with special reference to aircraft construction. Lab. fee $6.00. Mr. Peters, Mr. Schumann.

109. Airplane Engines. I; 2 cr. Fundamental principles of aircraft engine construction, operation, and maintenance. Characteristics of gasoline and lubricating oils. Study of modern engines, carburetors, ignition systems, starters, and superchargers. Prerequisite: Steam and Gas 1 or 3, or concurrent registration. Mr. L. A. Wilson.

110. Aeronautical Meteorology. II; 1 cr. Prerequisite: Junior standing. Mr. Miller.

130. Airplane Engine Testing. II; 2 cr. Prerequisite: Beginning course in Steam and Gas laboratory. Lab. fee $6.00. Mr. G. C. Wilson.

CHEMICAL ENGINEERING

Otto Louis Kowalke, Ch.E., *Professor of Chemical Engineering, Chairman*
Olaf Andreas Hougen, Ch.E., Ph.D., *Associate Professor of Chemical Engineering*
Oliver Patterson Watts, Ph.D., Sc.D., *Associate Professor of Chemical Engineering*
Roland Andrew Ragatz, Ph.D., *Assistant Professor of Chemical Engineering*
Alois John Krombholz, M.S., *Instructor in Chemical Engineering*
Norman Hugo Ceaglske, M.S., *Instructor in Chemical Engineering*
Pierce G. Ellis, B.S., *Instructor in Chemical Engineering*

8. Metallography for Mechanical Engineers. II; 2 cr. The microscopic examination of the structure of steels used for cutting metals; metals suited to machine tool construction, as affected by heat treatment. Not open to chemical engineers. Lab. fee $6.00; deposit $1.00. Mr. Ragatz, Mr. Krombholz.

12. Technical Examination of Fuels, Gases, and Water. I, II; 2 cr. Recitations and laboratory work together with reports on the interpretation of experimental results. Prerequisites: Chemistry 11 or 14, Physics 1 or 51. Lab. fee $6.00; deposit $2.00. Mr Ceaglske, Mr. Ellis.

15. Industrial Chemistry. I; 3 cr. II; 2 cr. Lectures and recitations in the technology of important chemical industries. Prerequisite: Chemistry 120 or concurrent enrollment. For Letters and Science chemistry majors. Mr. Hougen.

16. Industrial Chemistry. I; 3 cr. II; 2 cr. Lectures and recitations on the technology and the economic phases of important chemical industries. Prerequisite: Chemistry 120 or concurrent enrollment. For Chemistry-Commerce course students. Mr. Kowalke, Mr. Hougen.

18. Fundamentals of Chemical Engineering. II; 2 cr. The applications of the laws of stoichiometry, gases, vapors, and solubilities to problems in chemical industries. Prerequisites: Math. 52, Chemistry 11 or 14. Mr. Ragatz.

23. Manufacturing Equipment. I; 2 cr. A survey of the equipment used in, and of the principles underlying chemical manufacturing operations. Not open to chemical engineers. Prerequisites: College algebra, Chemistry 1, Physics 1. Mr. Ragatz.

101. Applied Electrochemistry. I; 5 cr. The laws and principles of electrolysis, with their applications to electroplating, the refining of metals, and electrochemical manufacture. Lab. fee $6.00. Mr. Watts, Mr. Krombholz.

102. Electric Furnaces. II; 4 cr. Recitation, two hours: on the construction, operation, and products of electric furnaces. Laboratory practice, four hours: melting steel; making calcium carbide, carborundum, and alloys. Lab. fee $8.00. Mr. Watts.

111. Manufacturing Operations. II; 4 cr. Lectures, recitations, and reports on fundamental principles of sizing, mechanical separation of materials, evaporation and drying, filtration, distillation, flow of fluids, etc., and the effective arrangements of and suitable materials for constructing appliances to carry out these operations. Prerequisites: Mathematics 55, Steam and Gas 3, Chem. Engr. 18. Mr. Kowalke.

113. Gas Manufacture and Distribution. I; 2 cr. Lectures and recitations on technology of gas for domestic and industrial heating and on problems of distribution. Prerequisite: Senior standing. Mr. Kowalke.

114. Chemical Manufacture. 4 cr. Laboratory practice supplementary to course 111; efficiency tests on unit operations, manufacture of chemical products, recovery of products from waste materials. Prerequisites: Chemistry 14, Chem. Engr. 111. Required for chemical engineers as summer work; elective for other students. Lab. fee $12.00. Mr. Kowalke.

115. Industrial Chemistry. I; 3 cr. II; 2 cr. Lectures and recitations on the scientific, engineering, and economic aspects of selected chemical industries. Prerequisites: Chem. Engr. 111, Chemistry 120 or concurrent enrollment. For students in Chemical Engineering and for graduates. Mr. Kowalke.

116. Thermal Processes of Chemical Engineering. Yr; 2 cr. Application of the principles of thermophysics and physical chemistry to the solution of problems in the thermal process in chemical industries. Prerequisite: Chem. Engr. 111. Mr. Hougen.

117. Technical Pyrometry. I; 2 cr. Recitations and laboratory work on the principles and methods of industrial measurement and control of temperature. Prerequisite: Physics 52. Lab. fee $6.00. Mr. Ragatz, Mr. Ceaglske, Mr. Ellis.

119. Metallography. I; 3 cr. Lectures and laboratory instruction in the microscopic examination and microphotography of iron, steel (including special steels), brasses, bearing metals, and other technical alloys, and the effect of heat and mechanical treatment together with the theories of solidification and constitution of these materials. Prerequisites: General chemistry and Physics 1 or 51. Lab. fee $6.00; deposit $1.00. Mr. Ragatz, Mr. Krombholz, Mr. Ellis.

122. Special Problems. II; 4 cr. One or more assigned problems involving greater opportunity for independent effort than is possible in the usual laboratory exercise. A detailed typewritten report is required on each project. Prerequisites: Chem. Engr. 101, 111, 117, 119. Lab. fee $9.00. Staff.

124. Industrial Microscopy. I; 3 cr. Lectures and laboratory work on micrometry and the microscopic and microchemical examination of selected industrial products. Prerequisites: Chemistry 120, Physics 51. Lab. fee $6.00. Mr. Hougen.

125. MATERIALS OF CONSTRUCTION FOR EQUIPMENT IN CHEMICAL INDUSTRY. I; 2 cr. Mr. Kowalke.

126. METALLOGRAPHY OF ALLOY STEELS. II; 2 cr. Prerequisite: Chem. Engr. 119. Mr. Ragatz.

127. METALLOGRAPHY OF NON-FERROUS METALS AND ALLOYS. II; 2 cr. Prerequisite: Chem. Engr. 119. Lab. fee $6.00. Mr. Ragatz.

128. ADVANCED METALLOGRAPHIC TECHNIQUE. II; 1 cr. Prerequisite: Chem. Engr. 119. Lab. fee $3.00. Mr. Ragatz.

200. RESEARCH. *cr. Assigned experimental and library investigation together with conferences and written reports. Lab. fee $3.00 per credit. Mr. Kowalke, Mr. Watts, Mr. Hougen, Mr. Ragatz.

231. SEMINARY. Yr; 2 cr. The presentation and discussion of papers dealing with various problems in chemical engineering. Mr. Kowalke.

232. CORROSION. II; 2 cr. Reading course. Hours to be arranged. Mr. Watts.

234. THEORETICAL CONCEPTS IN MODERN METALLOGRAPHIC SCIENCE. Yr; 2 cr. Mr. Ragatz.

CITY PLANNING

(See Highway Engineering and City Planning, page 251.)

DRAWING

HERBERT DENNY ORTH, B.S., *Associate Professor of Drawing and Descriptive Geometry, Chairman*
ADAM VAUSE MILLAR, M.S., *Professor of Drawing and Descriptive Geometry*
JOSEPH DOW LIVERMORE, B.S., *Assistant Professor of Drawing and Descriptive Geometry*
KENNETH GRINNELL SHIELS, M.S., *Assistant Professor of Drawing and Descriptive Geometry*
HOWARD BAILEY DOKE, *Instructor in Drawing and Descriptive Geometry*
FULLER ORVILLE GRIFFITH, B.S., *Instructor in Drawing and Descriptive Geometry*
ROBERT ROCKWOOD WORSENCROFT, B.S., *Instructor in Drawing and Descriptive Geometry*

1. ELEMENTS OF DRAWING. I, II; 3 cr. Working drawings; third angle projection, lettering, tracing, and blueprinting. Orth, Doke, and Worsencroft's *Mechanical Drawing*. Lab. fee $1.00. Mr. Orth and staff.

2. ELEMENTS OF DRAWING. II; 3 cr. Working drawings, lettering, sketching, isometric, and cabinet drawing. Orth, Doke, and Worsencroft's *Mechanical Drawing*. Prerequisite: Drawing 1. Lab. fee $1.00. Mr. Orth and staff.

3. Descriptive Geometry. I, II; 3 cr. Fundamental theory of point, line and plane, with application to solids. Generation and classification of lines and surfaces; tangent planes; sections, intersections and developments. Millar, Maclin, Markwardt, and Shiels' *Descriptive Geometry.* Prerequisite: Drawing 2. Mr. Millar, Mr. Orth, Mr. Shiels, Mr. Livermore.

7. Freehand Lettering. I, II; 1 or 2 cr. Construction and composition of Classic Roman capitals, "lower case" letters, English Gothic, black letter, and modern script. Special emphasis given to the choice of lettering styles in advertising design. Prerequisite: Drawing 1. Lab. fee $0.75. Mr. Doke.

8. Advanced Freehand Lettering. I, II; 2 cr. Continuation of Course 7, which is prerequisite. Lab. fee $0.75. Mr. Doke.

9. Advanced Freehand Lettering. I, II; 2 cr. Continuation of 8, which is prerequisite. Lab. fee $0.75. Mr. Doke.

ELECTRICAL ENGINEERING

Edward Bennett, E.E., *Professor of Electrical Engineering, Chairman*
Cyril Methodius Jansky, B.A., B.S., *Professor of Electrical Engineering*
John Reese Price, B.S., *Professor of Electrical Engineering*
James Webster Watson, B.S., *Professor of Electrical Engineering*
Leslie Erskine Allan Kelso, B.S., *Assistant Professor of Electrical Engineering*
Glenn Koehler, M.S., *Assistant Professor of Electrical Engineering*
Edmund Dale Ayres, M.S., *Assistant Professor of Electrical Engineering*
Gordon Frederick Tracy, M.S., *Assistant Professor of Electrical Engineering*
Clarence Alois Andree, Ph.D., *Instructor in Electrical Engineering*
Reginald Ralph Benedict, MS., *Instructor in Electrical Engineering*
Royce Everett Johnson, M.S., *Instructor in Electrical Engineering*
Henry Joseph Kubiak, B.S., *Instructor in Electrical Engineering*
Ludvig Conrad Larson, E.E., *Instructor in Electrical Engineering*

1. Fundamentals of Electrodynamics. I, II; 4 cr. An introductory course for sophomore electrical engineers dealing with the derivation and application of the basic ideas and laws relating to electrostatic and electromagnetic phenomena. Open to students of other colleges. Prerequisites: Physics 53 and Math. 54. Mr. Benedict, Mr. Larson, Mr. Kubiak.

2. Direct Current Machinery. I, II; 4 cr. A continuation of E.E. 1. Construction and operation of direct current machinery. Prerequisite: E.E. 1. Mr. Watson, Mr. Tracy, Mr. Larson.

3. Alternating Current Circuits and Machinery. II; 4 cr. Single phase and polyphase circuits; synchronous generators and motors. Prerequisite: E.E. 2. Mr. Price, Mr. Watson, Mr. Tracy.

4. Alternating Current Machinery. I; 4 cr. Transformers, induction motors, synchronous converters. A continuation of E.E. 3. Mr. Price, Mr. Watson, Mr. Tracy.

6. Electrical Machinery. II; 3 cr. Deals with the laws of the electric and magnetic circuit and the characteristics of direct current machinery. Primarily for mechanical engineers. Prerequisite: Physics 52. Mr. Kelso.

7. ELECTRICAL MACHINERY. I; 3 cr. Alternating current theory and machinery. Primarily for mechanical engineers. Prerequiste: E.E. 6. Mr. Kelso.

8. ELECTRICAL MACHINERY. I; 3 cr. Laws of the electric and magnetic circuit and the characteristics of direct current machinery. Primarily for mining and chemical engineers. Prerequisite: Physics 52. Lab. fee $3.00. Mr. Ayres.

9. ELECTRICAL MACHINERY. II; 3 cr. Alternating current theory and machinery. Primarily for mining and chemical engineers. Prerequisite: E.E. 8. Lab. fee $3.00. Mr. Ayres.

10. DIRECT CURRENT MACHINERY. II; 3 cr. Primarily for civil engineers. Mr. Jansky, Mr. Andree.

25. ENGINEERING PAPERS. I, II; 2 cr. Preparation and presentation of technical papers. Open to engineering seniors. Mr. Jansky.

104. ELECTRIC MACHINE DESIGN. II; 3 cr. Individual design of a direct or an alternating current machine. Prerequisite: E.E. 2. Mr. Watson.

116. ELECTRIC CIRCUITS. I; 3 cr. Analytical and oscillograph study of starting currents of transformers and transmission lines, short circuit currents of alternators, generation of radio frequencies, distribution of current and voltage in loaded and unloaded telephone lines. Prerequisite: E.E. 3. Lab. fee $3.00. Mr. Bennett, Mr. Benedict.

120. INSULATION AND HIGH TENSION TESTING. II; 3 cr. Dielectric theory. Properties and laboratory tests of insulators and insulating materials. Prerequisite: E.E. 3. Lab. fee $3.00. Mr. Bennett, Mr. Benedict.

122. ELECTRIC METERS. I; 3 cr. Analytical study of instruments; methods of calibration and measurement; watthour meters and their application; instrument transformers; and relays. Laboratory work in Electrical Standards Laboratory. Prerequisite: E.E. 3. Lab. fee $3.00. Mr. Johnson.

127. ELECTRICAL CENTRAL STATIONS. II; 3 cr. Substation and central station design. Technical and economic choice and arrangment of electrical equipment. Prerequisite: E.E. 3. Mr. Ayres.

133. ILLUSTRATION AND PHOTOMETRY. II; 3 cr. Commercial illuminants and their applications to lighting. Design of illuminating systems. Lectures and laboratory work. Lab. fee $3.00. Mr. Johnson.

137. POWER DISTRIBUTION. I; 3 cr. Technical and economic features of local wiring systems; city and rural distribution; and transmission lines. Prerequisite: E.E. 3. Mr. Ayres.

154. ELEMENTS OF RADIO COMMUNICATION. I; 3 cr. The properties of circuits and devices used in radio communication. With laboratory work. Prerequisite: E.E. 3. or senior standing in physics. Lab. fee $3.00. Mr. Koehler.

155. THERMIONIC VACUUM TUBE CIRCUITS. I; 3 cr. An experimental and analytical study of the properties of amplifier and oscillator circuits and of the performance of the thermionic vacuum tube in telephone and radio networks. With laboratory work. Prerequisite: E.E. 3. or senior standing in physics. Lab. fee $3.00. Mr. Koehler.

156. Elements of Wire Communication. II; 3 cr. Theory of telephone and telegraph instruments and circuits. The theory of the long line. With laboratory work. Prerequisite: E.E. 3. or senior standing in physics. Lab. fee $3.00. Mr. Koehler.

157. Radio Circuit Analysis and Design. II; 3 cr. A continuation of E.E. 155. Treating of such topics as: amplifiers and their design, operation of triode oscillators in parallel, the design of triode oscillators, modulation and demodulation, analysis and design of radio transmitting and radio receiving sets, elementary radiation theory, partial analysis of a complete radio communication system. With laboratory work. Prerequisite: E E. 155. Lab. fee $3.00. Mr. Koehler.

160. Advanced Individual Studies. I, II; *cr. The object of the course is to facilitate investigative work and to develop the initiative of the student. The student is to submit reports on one or more engineering problems requiring analytical investigative work. The study may be of an economic, historical, statistical, theoretical, or experimental type. Studies of unusual merit will be accepted as theses and filed in the University Library. The election of an individual study must receive the approval of the E.E. Course Committee.

213. Electric Machine Theory. II; 3 cr. Analytical treatment of the behavior of three-phase induction motors and transformers under unbalanced conditions; calculation of the rotating m.m.f. of a symmetrical three-phase winding; sub-synchronous phenomena in synchronous machines; and heat losses in conductors located in deep slots. Prerequisite: E.E. 4.

214. Advanced Dynamo Laboratory. II; 3 cr. Advanced laboratory tests with direct and alternating current machinery. Prerequisites: E.E. 54 and 4. Lab. fee $6.00. Mr. Price.

231. Transmission and Distribution of Power. Yr; 3 cr. This course deals with the following features of the transmission and distribution of electrical energy: general economic features of electrical transmission, the constants of the transmission line and apparatus, derivations of equations of the transmission line, abnormal potentials and lightning arresters, insulating material, and line insulators, line construction, relays, and automatic sectionalizing. Mr. Bennett.

232. Advanced Theory of Electric Circuits. Yr; 3 cr. This course treats of the following aspects of the theory of electric circuit phenomena: the investigation of the transient phenomena occuring when the conditions in simple and coupled circuits are suddenly changed; the oscillations or surges set up in transmission and cable systems by grounding and switching operations; traveling and stationary waves in transmission and telephone lines; current and magnetic flux distribution at high frequencies. The analytical work is supplemented by experimental work with the oscillograph Lab. fee $3.00. Mr. Bennett, Mr. Benedict.

233. Seminar in Electric Circuit Theory. Yr; 3 cr. This course is a further development of the topics listed under E.E. 232 and in addition treats the following subjects: electromagnetic radiation, electric wave filters in the steady and transient state, the selective properties of circuits and filter networks to impulse excitation, the development and application of the Heaviside-Carson expansion formula and other advanced analytical methods of treating the phenomena which take place in electrical networks in the transient state. Prerequisite: E.E. 232. Mr. Bennett.

SIGNAL CORPS COURSES. Electrical engineers who enroll in the Signal Corps unit of the Reserve Officers' Training Corps are required to take two 3-credit courses which must be selected from the following group: E.E. 116, 154, 155, 156, 157, 232. Men who enroll in this unit, after satisfactorily completing the course and meeting the military requirements, may be commissioned in the Officers' Reserve Corps if they so desire.

DYNAMO LABORATORY COURSES

Mr. Price and Laboratory Instuctors

51. ELECTRODYNAMICS LABORATORY. I, II; 2 cr. Basic electrostatic and electromagnetic experiments and measurements. To accompany E.E. 1. Lab. fee $6.00.

52. DYNAMO LABORATORY. I or II; 2 cr. Tests of direct current dynamos and appliances. To accompany E.E. 2. Lab. fee $6.00.

53. ALTERNATING CURRENT LABORATORY. II; 2 cr. Experimental study of a. c. circuits; tests of generators, motors and appliances. To accompany E.E. 3. Lab. fee $6.00.

54. ALTERNATING CURRENT LABORATORY. I; 2 cr. Continuation of E.E. 53. Tests of synchronous generators and motors, transformers, converters, and induction motors. To accompany E.E. 4. Lab. fee $6.00.

56. DIRECT CURRENT LABORATORY. II; 2 cr. For mechanical engineers. To accompany E.E. 6. Lab. fee $6.00.

57. ALTERNATING CURRENT LABORATORY. I; 2 cr. Primarily for mechanical engineers. Prerequisite: E.E. 7. Lab. fee $6.00.

60. DIRECT CURRENT LABORATORY. II; 1 cr. To accompany E.E. 10. Lab. fee $3.00.

ENGINEERING CONTRACTS AND SPECIFICATIONS

DANIEL WEBSTER MEAD, C.E., *Professor of Hydraulic Engineering*
ARNO THOMAS LENZ, M.S., *Instructor in Hydraulic Engineering*
HAROLD WILLIAM RUF, M.S., *Instructor in Sanitary Engineering*

101. CONTRACTS AND SPECIFICATIONS. II; 2 cr. Engineering relations, legal, contractual and personal preparation of contracts, specifications, and other engineering papers.

ENGINEERING ADMINISTRATION

PATRICK HENRY HYLAND, M.E., *Associate Professor of Machine Design*
JAMES WILBUR MCNAUL, B.S., *Assistant Professor of Machine Design*
EDMUND DALE AYRES, M.S., *Assistant Professor of Electrical Engineering*

101. ENGINEER'S RELATIONS DURING CONSTRUCTION. I; 3 cr. The engineer's professional, ethical, business, legal, accounting, and commercial relations; analysis of corporation reports, financial statements, technical report writing and organization of reports; estimating principles; organization of corporations; installation plans; law of real property; land values; unit costs of construction; contracting overhead costs; valuation; engineer's relation to fixed property charges, maintenance, depreciation and retirement reserves, and fair return; corporation finance for engineers; financing costs; failures, receivership and reorganization. Prerequisite: Senior standing. Mr. Ayres.

102. ENGINEER'S RELATIONS DURING PRODUCTON AND OPERATION. II; 3 cr. Administration; executive functions; public relations; banking relations; scientific factory and shop management; industrial cost analysis; industrial overhead burden; fixed and variable factory costs; industrial relations and labor survey; welfare work; sales, advertising and insurance; utility engineer's cost analysis and rate making in electric, gas, water, telephone, street railway and steam railroad utilities; fare analysis and traffic studies. Prerequisite: Senior standing. Mr. Ayres.

103. CORPORATION REPORTS. I; 2 cr. The accounting, cost analysis and efficiency methods of measuring the engineer's accomplishments; accounting principles; voucher systems; flow of purchase costs of material and labor into construction and operation; flow of stock room transactions, sales of products and cash records; analysis of balance sheets, and financial statements; distortion and juggling of corporation financial reports; engineer's technical function in adjusting and closing entries; engineer's financial check and test units applied to the actual figures of existing utilities and industries. Prerequisite: Junior or senior standing.

104. THESIS OR ADVANCED INDIVIDUAL STUDIES. I, II; 1 to 3 cr. Individual investigation in commercial, statistical, economic or technical advanced subjects; to create investigative ability, initative, sequential development, logical presentation, and specialized preparation in practical subjects. Meritorious reports are accepted as theses and filed in the University Library. Prerequisite: Senior standing. Mr. Ayres.

105. MANUFACTURING AND PRODUCTION METHODS. I; 2 cr. Factory and shop administration and management; production scheduling and planning; dispatching and manufacturing methods. A general survey of the most suitable material, special tools and fundamental processes of manufacturing, together with the relations of the allied departments of pattern shop, foundry and machine shops. Prerequisite: Senior standing. Mr. McNaul.

106. POWER PLANT ECONOMICS AND DESIGN. II; 3 cr. Load curves, principles underlying the selection of power units; power plant layout, building design, equipment selection, estimates, operating charges, fixed charges, etc. Drawing room design and estimate of small power plant. Prerequisite: Senior standing. Mr. Hyland.

ENGINEERING ENGLISH AND ENGINEERING JOURNALISM

LESLIE FLANDERS VAN HAGAN, C.E., *Professor of Railway Engineering*

1a. ENGINEERING ENGLISH. I; 1 cr. To supplement the English work of the freshman year and to assist in maintaining standards in speech and writing throughout the last two years of the engineering course. Prerequisite: English 1b.

1b. ENGINEERING ENGLISH. II; 1 cr. Follows course 1a.

2a. ENGINEERING ENGLISH. I; 1 cr. Follows course 1b.

2b. ENGINEERING ENGLISH. II; 1 cr. Follows course 2a.

10. ENGINEERING JOURNALISM. I, II; 1 cr. Editing and managing a technical magazine.

HIGHWAY ENGINEERING AND CITY PLANNING

HAROLD FREDERICK JANDA, C.E., *Professor of Highway Engineering and City Planning, Chairman*

HIGHWAY ENGINEERING

101. HIGHWAY ENGINEERING. I; 1 cr. This course is especially planned for those students desiring a general knowledge of constructing and maintaining earth, gravel, macadam, and concrete roads. Special attention is devoted to the Wisconsin highway conditions. Mr. Janda.

102. HIGHWAY ENGINEERING. II; 3 cr. Economics; traffic census; drainage; construction and maintenance methods of the various types of road surfaces. Prerequisite: Railway Engr. 1. Mr. Janda.

103. ADVANCED HIGHWAY DESIGN. I; 3 cr. Special problems of an advanced nature in the construction of the modern highway. Prerequisite: Highway Engr. 102 or its equivalent. Mr. Janda.

104. HIGHWAY MATERIALS TESTING. II; 3 cr. The testing of bituminous and non-bituminous road materials. Prerequisite: Highway Engr. 102. Lab. fee $6.00. Mr. Janda.

105. HIGHWAY MAINTENANCE. I; 2 cr. Equipment depots; maintenance machinery; shoulder and ditch maintenance; methods of surface maintenance; snow-drift prevention and removal; etc. Prerequisite: Highway Engr. 102. Mr. Janda.

CITY PLANNING*

101. CITY PLANNING. I, II; 2 cr. Growth of cities; land subdivision; classes and uses of streets; zoning; parks and playgrounds; regional planning. Mr. Janda.

*Students desiring work in planning and planting of public grounds, parks, and home grounds, see courses in Horticulture, College of Agriculture.

104. MUNICIPAL ENGINEERING PRACTICE. I; 2 cr. Width and arrangement of streets; curb and gutter; sidewalks; street surface details; crowns and intersections; landing fields; trees and shrubs. Prerequisite: Topographic Engr. 103. Mr. Janda.

105. TRAFFIC CONTROL. II; 2 cr. Street systems; causes of accidents; parking; traffic signals; ordinances; administration. Prerequisite: Junior standing. Mr. Janda.

HYDRAULIC AND SANITARY ENGINEERING

DANIEL WEBSTER MEAD, C.E., *Professor of Hydraulic Engineering, Chairman*
FRANCIS MURRAY DAWSON, M.C.E., *Professor of Hydraulic Engineering*
LEWIS HANFORD KESSLER, M.S., C.E., *Assistant Professor of Hydraulic Engineering*
MERLE STARR NICHOLS, Ph.D., *Assistant Professor of Sanitary Chemistry*
ARNO THOMAS LENZ, M.S., *Instructor in Hydraulic Engineering*
HAROLD WILLIAM RUF, M.S., *Instructor in Sanitary Engineering*

1. HYDRAULICS. I, II; 3 cr. The elementary principles of the mechanics of fluids, and the theory, calibration and use of instruments for hydraulic measurements. Recitations, lectures, and laboratory work. Prerequisite: Mechanics 1, 2. Lab. fee $3.00. Mr. Dawson, Mr. Kessler, Mr. Lenz, Mr. Ruf.

2. HYDRAULICS. I, II; 4 cr. Similar to course 1, but having additional recitation and laboratory work. Required of junior civil engineering students. Prerequisites: Mechanics 1, 2. Lab. fee $3.00. Mr. Dawson, Mr. Kessler, Mr. Lenz.

102. TESTING OF HYDRAULIC MACHINES. I, II; 2 cr. A course designed to acquaint the student with the methods of hydraulic machine testing. Tests are made of impulse and turbine water wheels, centrifugal and reciprocating pumps, hydraulic rams, air lift pumps, etc. Laboratory work with occasional lectures and computing periods. Prerequisite: Hydr. 1 or 2. Lab. fee $5.00. Mr. Kessler.

103. EXPERIMENTAL HYDRAULICS. I, II; 1 to 5 cr. Laboratory investigation of the relation of experimental results to the theory of hydraulic machinery and of the flow of water under various conditions. The special field to be studied may be selected by the student, with the approval of the instructor. Prerequisite: Hydr. 1. Lab. fee $3.00 per credit. Mr. Dawson.

104. WATER POWER ENGINEERING. I; 3 cr. The theory, investigation, and development of water power. Prerequisite: Hydr. 1. Mr. Mead, Mr. Lenz.

105. HYDRAULIC MACHINERY. II; 2 cr. The theory of hydraulic motors, pumps, etc., and their economic selection and installation. Prerequisite: Hydr. 1. Mr. Mead, Mr. Lenz.

110. HYDROLOGY. I; 2 cr. Water in its physical, geological, and meteorological relations as applied to water power, water supply, irrigation, drainage, and sanitary work. Mr. Mead, Mr. Dawson, Mr. Ruf.

112. DRAINAGE AND IRRIGATION. II; 2 cr. Theory, practice, and economy of sanitary and agricultural drainage, flood control, and application of water to irrigation of land. Prerequisites: Hydr. 1, 110. Mr. Mead, Mr. Dawson.

113. Hydraulic Design. I; 2 cr. Investigation of water supply for power, irrigation or municipal purposes. Prerequisites: Hydr. 1, 110. Mr. Mead, Mr. Lenz.

114. Design of Various Features of Hydraulic or Sanitary Work. Prerequisites: Hydr. 1, 110, 113. Mr. Mead, Mr. Lenz.

115. Hydraulic Problems. I, II; 1-3 cr Advanced hydraulics for seniors and graduates. Prerequisite: Hydr. 1 or 2. Mr. Dawson.

121. Water Supply Engineering. I; 3 cr. Theory, development, and improvement of water supplies for domestic, manufacturing, and fire service. Prerequisites: Hydr. 1, 110. Mr. Mead, Mr. Dawson, Mr. Ruf.

122. Sewerage. II; 2 cr. The principles of design and maintenance of sanitary and storm sewer systems. Prerequisite: Hydr. 1 or 2, or concurrent registration. Mr. Kessler, Mr. Ruf.

123. Sewage and Garbage Disposal. I, II; 1 or 2 cr. Development, disposal works and methods of treatment. Additional credit may be elected, in which the student will design a treatment plant. Mr. Kessler, Mr. Ruf.

124. Water and Sewage Analysis. I; 2 cr. Study of laboratory methods of chemical and bacterial analysis and the interpretation of results. Mr. Nichols.

125. Sewage and Trade Wastes Analysis. I, II; 1 to 3 cr. Special studies on sewage and trade wastes. Prerequisite: Chemistry 2b and junior standing. Lab. fee $5.00. Mr. Ruf.

126. Sanitary Engineering Seminar. I; 1 cr. Review of literature on sewage and trade waste problems. Mr. Nichols.

127. Sanitary Engineering Seminar. II; 1 cr. Discussion of recent developments in sewage and trade waste disposal and in water purification. Mr. Nichols, Mr. Ruf.

MACHINE DESIGN

Patrick Henry Hyland, M.E., *Associate Professor of Machine Design, Chairman*
James Wilbur McNaul, B.S., *Assistant Professor of Machine Design*
Russell Edward Puerner, B.S., *Assistant Professor of Machine Design*
Walter Haynes Hall, B.S., *Instructor in Machine Design*

1. Mechanism. I; 4 cr. The relative motions of machine parts including linkages, cams, toothed gears, beltings, chains, and ratchets. Prerequisites: Drawing 1, 2. Mr. Hyland, Mr. Puerner, Mr. McNaul, Mr. Hall.

2. Design Practice. II; 1 cr. A short course treating of the practical consideration of machine design. Study of the use and application in design of engineering material, formulae and tabulated data, together with a discussion of factor of safety, allowable stress, etc. Prerequisite: Machine Design 1. Mr. Hyland.

3. MACHINE ELEMENTS. I, II; 4 cr. Study of the application of the principles of mechanics and empirical methods to the design of machine elements. Commercial drafting room practice. Prerequisites: Machine Design 1, Mechanics 1, 2; Mechanics 3 or concurrent enrollment. Mr. Hyland.

4. ADVANCED MACHINE DESIGN. I, II; 4 cr. A continuation of course 3 applied to the design of complete machines. Prerequisite: Machine Design 3. Mr. McNaul, Mr. Puerner.

5. MACHINE ELEMENTS. I, II; 3 cr. For electrical and chemical engineers. A study of the mathematical and empirical methods for the design of machine parts, with a parallel drafting course conforming to the requirements of modern drafting practice. Prerequisites: Machine Design 1, Mechanics 1, 2, 3. Mr. Puerner.

12. MACHINE TESTING. II; 2 cr. Experimental determinations of the strength of machine elements and the efficiency of machines. Prerequisite: Machine Design 3. Lab. fee $6.00. Mr. Puerner, Mr. McNaul, Mr. Hall.

101. KINEMATICS AND DYNAMICS OF MACHINERY. II; 2 or 3 cr. Fundamental concepts of motion, velocity, acceleration, and equilibrium; graphical and analytical solution of velocities and accelerations in machine parts; determination of static and inertia forces in machines; combinations of static and inertia forces; effect of stress concentration and fatigue in machine parts; design of high-speed machines for strength, rigidity, balance, and lubrication; governors as to type and design. Mr. McNaul.

MECHANICS

EDWARD ROSE MAURER, B.C.E., *Professor of Mechanics, Chairman*
JESSE BENJAMIN KOMMERS, M.E., *Professor of Mechanics*
MORTON OWEN WITHEY, C.E., *Professor of Mechanics*
HARRY E. PULVER, C.E., *Associate Professor of Civil and Structural Engineering*
RAYMOND JEFFERSON ROARK, M.S., *Associate Professor of Mechanics*
LORING OUTHIER HANSON, B.S., *Instructor in Mechanics*
RICHARD SCHEUNEMANN HARTENBERG, B.S., *Instructor in Mechanics*
JAMES GOULDEN VAN VLEET, B.S., *Instructor in Mechanics*
GEORGE WILLIAM WASHA, B.S., *Instructor in Mechanics*
KURT FRANK WENDT, B.S., *Instructor in Mechanics*

1. STATICS. I, II; 3 cr. Treated, as are all of the following courses, with special reference to the requirements of engineers. Prerequisite: Physics 51. First nine weeks of each semester.

2. DYNAMICS. I, II; 2 cr. Prerequisites: Mechanics 1; Mathematics 55, or concurrent registration. Last nine weeks of each semester.

3. MECHANICS OF MATERIALS. I, II; 5 cr. Prerequisites: Mechanics 1; Mathematics 55, or concurrent registration.

The next four courses are principally laboratory work; assigned readings and reports; and preparation and manufacture of materials.

51. MATERIALS OF CONSTRUCTION. I; 2 cr. Prerequisite: Mechanics 3 or concurrent registration. For civil engineers. Lab. fee $6.00.

52. MATERIALS OF CONSTRUCTION. II; 2 cr. Continuation of 51. Lab. fee $6.00.

53. MATERIALS OF CONSTRUCTION. I, II; 2 cr. Prerequisite: Mechanics 3 or concurrent registration. For electrical, mechanical, and mining engineers. Lab. fee $6.00.

54. MATERIALS OF CONSTRUCTION. II; 2 cr. Prerequisite: Mechanics 3 or concurrent registration. For chemical engineers. Lab. fee $6.00.

106. ADVANCED MECHANICS OF MATERIALS. II; 3 cr. Some topics (curved beams, flat plates, thick cylinders, springs, etc.) and methods of analysis not included in Mechanics 3. Prerequisites: Mechanics 2 and 3. Mr. Maurer.

107. ADVANCED TECHNICAL MECHANICS. I; 3 cr. Especially dynamics of machinery; vibrations; balancing; gyroscopic effects; whirling shafts; critical speeds. Prerequisite: Mechanics 2. Mr. Maurer.

108. MATERIALS OF CONSTRUCTION. II; 2-5 cr. Laboratory research on the various materials. Research on concrete, plain and reinforced. Prerequisite: Mechanics 51 and 53. Lab. fee $3.00 per cr. Mr. Withey.

109. GRAPHICS. II; 2 cr. A development of the principles of graphical computation and construction of graphic charts. Application is made to various engineering problems, including representation of experimental data. Mr. Kommers.

110. DYNAMIC STRESS. II; 2 cr. Stress and strain due to impact and sudden loading; inertia stresses in rotating discs, connecting rods, and other moving bodies; wind and earthquake stresses in structures. Impact tests. Prerequisites: Mechanics 1, 2, and 3. Mr. Roark.

MINING AND METALLURGY

RICHARD STANISLAUS MCCAFFERY, E.M., *Professor of Mining and Metallurgy, Chairman*
SCOTT MACKAY, M.S., *Associate Professor of Metallurgy*
EDWIN ROY SHOREY, E.M., *Associate Professor of Mining and Metallurgy*
GEORGE JOHN BARKER, E.M., *Assistant Professor of Mining and Metallurgy*
JOSEPH FRANCIS OESTERLE, Ph.D., *Assistant Professor of Metallurgy*

12. MINE SURVEYING. II; 2 cr. Classroom and drafting room study of the methods of surface and underground mine surveying, including shaft plumbing, underground practice, open-pit tonnage, progress, and final estimates. Followed by a week's survey of a zinc mine in southwest Wisconsin, or a nearby Wisconsin iron mine. Prerequisite: T.E. 108. Lab. fee $3.00 Mr. Shorey.

126. CLAY PRODUCTS MANUFACTURE. I, II; 2 or 3 cr. Lectures and laboratory work. Clay testing, brick, tile, and ceramics manufacture. The making of Portland cement. Lab. fee $3.00 per credit. Prerequisites: Chem. 2b; Phys. 52. Mr. Barker.

150. ECONOMIC ASPECTS OF MINING. II; 3 cr. The mining industry. Mineral resources and recovery. Mining and finance. Typical mining organizations. For students in economics and commerce and colleges other than engineering, of junior, senior, or graduate rank. Mr. McCaffery.

MINING

101. Excavation and Tunneling. I; 3 cr. Earth excavation; support of excavation, railway grading, canal and submarine excavation, irrigation and drainage channels, methods and cost. Steam shovels and mechanical excavators. Explosives; their chemical and physical natures, selection and use. Rock drills; rock excavation; tunneling; mine tunnels, hard and soft ground. Railway tunnels; in rock, in loose earth. Irrigation tunnels. Freezing processes, shields and caissons. Prerequisites: Chem. 2b; Phys. 52. Mr. Shorey.

103. Mining Methods. Yr; 3 cr. I. Classroom study of boring; various methods of prospect drilling and the compilation of results. Shaft sinking, underground prospecting and epxloration, development and methods of surface and underground mining ore, coal placer and other mineral deposits. II. Classroom and drafting room design of a method of mining a selected ore-body from actual drilling records. Prerequisite: Junior standing. Mr. Shorey.

104. Valuation of Mineral Properties. II; 3 cr. Preliminary and detailed examination and reports. Prospecting and sampling of mineral properties. Construction and use of sample-maps and assay-plans. Valuation of metal, coal, and other mineral properties. Decline, ultimate production, and valuation of oil properties. Mine taxation. Prerequisite: Mining 103. Mr. Shorey.

105. Mine Engineering. Yr; 3 cr. Drainage, control, and removal of mine water. Ventilation, lighting, haulage, hoisting, mechanics and methods of hoisting, including regenerative systems. Mine signal systems, underground power installations. Surface plant; power generation and transmission; building, roads, water supply housing, mine accidents, safety, rescue, and recovery. Lectures, quiz. Prerequisites: Mining 103, Mechanics 1, 2. Mr. Shorey.

106. Mine Plant Design. II; 3 cr. Design of mine plant, selection of equipment, including surface, power, and hoisting equipment, ventilating fans and haulage systems. Underground hoisting and pumping stations. Ore-pockets, mine pumps, and ore-handling equipment. Drafting room design. Prerequisites: Mining 101, 103, 105. Mr. Shorey.

107. Ore Dressing and Coal Washing. I; 5 cr. Principles and practice of ore dressing; preliminary breakers, and secondary crushers. Fine grinding and stamp-milling, sizing, screening and classifying. Concentration, jigging, tabling, slime concentration, log washing, magnetic and electro-static separation. Oil flotation. All sliming processes. Mechanical engineering of concentrators. Coal breakers and washers. Economic limits of concentration. Lectures, quiz, and laboratory practice. Prerequisite: Senior standing. Lab. fee $6.00. Mr. Shorey.

108. Milling Plant Design. II; 3 cr. The design of a mill to treat a Wisconsin zinc ore. The design and selection of equipment, including crusher, jigs, screens, elevators, and flotation equipment. Water supply and power-plant. Building construction. Drafting design. Prerequisites: Mining 105a, 107. Mr. Shorey.

109. Mine and Smelter Organization, Administration, and Accounts. II; 3 cr. The principles of administration applied to mines, mills, and smelters and their organizations. Labor supply and management. Wage system. Mine accounting, including a set of reports and financial statements of a month's operation of a typical mine and smelter. Home office accounts. Cost keeping. Ore sales and contracts. Lectures, quiz. Prerequisite: Senior standing. Mr. McCaffery.

121. Assaying. II; 3 cr. Lectures and laboratory practice covering the fire assay of ores, mattes, bullion, and other metallurgical products, using carefully checked ores, and smelter products from American and Canadian operations. Prerequisite: Chemistry 2b. Lab. fee $10.00. Mr. Barker.

210. Advanced Ore-Dressing Laboratory. I, II; 2 to 5 cr. Detailed research with a view to discovery of a method of treating a selected ore. The particular application of one or more of the principles of ore-dressing, covered in outline by Mining 107. Individual investigation. Lab. fee $3.00 per credit. Mr. Shorey.

215. Mill Design. II; 5 cr. The complete design of a mill to treat a selected ore on a tonnage basis. Especial emphasis is placed upon economic recoveries, methods and costs. A development of the work covered in courses 107 and 108. Individual design. Mr. Shorey.

220. Mine Development. I; 5 cr. A study of a prospected ore-body to determine economic method of mining and probable cost. A careful consideration of extraction and various methods of mining. Supporting systems and development ratios. Individual solution. Mr. Shorey.

METALLURGY

122 Principles of Metallurgy. II; 3 cr. The statics, kinetics, and thermodynamics of metallurgy. Chemical equilibrium, affinities, reaction velocities illustrated in the common metallurgical processes. Prerequisite: Chemistry 2b. Mr. McCaffery.

130. Physical Chemistry of the Metals. II; 3 cr. The underlying principles of physical metallurgy. The use of chemical statics as applied to metallurgical processes and smelting operations. Development of the principles of equilibrium in binary, ternary and quaternary systems. Lectures, quiz. Prerequisites: Chem. 2b, Phys. 52. Mr. Oesterle.

135. Thermodynamics of Metallurgical Reactions. Yr; 3 cr. Prerequisites: Chem. 2b, Math. 55, Phys. 52. Mr. McCaffery.

145. Phase Rule Applied to Metallurgy. I; 3 cr. A study of phase equilibrium in metal systems. The importance of allotropic forms, the intrepretation of equilibrium diagrams, and a comprehensive recognition of metastability. Prerequisite: Phys. 52. Mr. Mackay.

225. Metallurgical Laboratory. I, II; 2 to 5 cr. Detailed research problems covering selected metallurgical processes. The particular application of one or more of the metallurgical principles outlined by courses 122, 124. Lab. fee $3.00 per credit. Mr. McCaffery, Mr. Mackay.

230. Advanced Physical Chemistry of the Metals. I, II; 2 or 3 cr. An advanced treatment of the principles of physical metallurgy, and the direct application of these principles to metallurgical practice. Mr. Oesterle.

IRON AND STEEL METALLURGY

124. METALLURGY OF IRON AND STEEL. I, II; 3 cr. The iron blast furnace, bessemer, open-hearth, and electric furnace steel processes. Principles of design of furnaces and accessory apparatus. Control of furnace operation and product. Reheating, rolling, rolling mills, forging, hammers and presses, alloy steels, standard specifications, inspection methods. Prerequisites: Chem. 2b, Phys. 52. Mr. McCaffery.

128. IRON AND STEEL LABORATORY. Yr; 2 or 3 cr. I. The physical properties and structure of low and medium carbon steels as affected by their heat-treatment and mechanical treatment. II. The construction and effects of acid, neutral and basic oxidizing and reducing slags. Prerequisite: Mining 124 or concurrent registration. Lab. fee $3.00 per credit. Mr. Mackay.
materials, the cupola and air furnace. The properties of cast steel. Converter, open hearth and electric furnace castings. The properties and production of

131. FOUNDRY METALLURGY. II; 2 cr. The properties of gray iron, foundry raw malleable iron. Lectures, quiz. Prerequisites: Chem 2b, Phys. 52. Mr. McCaffery.

132. MANUFACTURE OF COKE. I; 2 cr. The preparation of coal for coking. The coking process in bee-hive and by-products ovens. The recovery of by-products. Lectures, quiz. Prerequisite: Chem. 2b. Mr. McCaffery.

140. HEAT TREATMENT OF SOFT AND MEDIUM STEELS. I; 3 cr. A study of the iron-carbon system based upon the diffusion of carbon and other soluble contained substances. A systematic discussion of the commercial heat treatment of forged and rolled steels. Prerequisites: Chem. 2b, Phys. 52. Mr. Oesterle.

231. THE IRON BLAST FURNACE. I; 5 cr. The construction of the furnace and accessory apparatus. The reactions in the furnace and factors influencing control of the process are taken up in lectures. Problems in furnace design are worked out in the drafting room. Mr. McCaffery.

232. CONVERTER AND OPEN-HEARTH STEEL. II; 5 cr. The chemistry of the refining processes. The order of reaction as affected by temperature, the various factors which enter into the control of the process, and the quality of the product are studied in lectures; and in the drawing-room the principles entering into the design of the converter and open-hearth plant are applied in the solution of practical problems. Mr. McCaffery.

250. PROPERTIES AND MANUFACTURE OF GRAY IRON CASTINGS. Yr; 3 cr. Mr. McCaffery, Mr. Mackay.

255. PROPERTIES AND MANUFACTURE OF STEEL CASTINGS. Yr; 3 cr. Mr. McCaffery, Mr. Mackay.

METALLURGY OF GOLD, SILVER, COPPER, LEAD, ZINC, AND MINOR METALS

123. METALLURGY OF COPPER, LEAD, AND ZINC. I; 5 cr. The blast and reverberatory processes for copper; the treatment or furnace products, converting matte and refining reverberatory, ore-hearth and blast furnace processes for lead; sinter roasting, disilverization of base bullion. Roasting and distillation processes for zinc. Lectures, quiz and laboratory practice. Prerequisite: Chem. 2b. Lab. fee $9.00. Mr. Barker.

125. METALLURGY OF MINOR METALS. I; 3 cr. The metallurgy of tin, nickel, aluminum, mercury, cadmium, bismuth, and antimony. Recovery of metal from by-products and secondary sources. Prerequisite: Chem. 2b. Lab. fee $3.00. Mr. Barker.

127. HYDROMETALLURGY OF GOLD, SILVER, COPPER, LEAD, AND ZINC. Yr; 3 cr. I. Classroom and laboratory study of the hydrometallurgy of gold and silver. Amalgamation. Cyanidation and chlorination of the ores of noble metals. Electrolytic refining of dorè bullion. Refining of cyanide precipitate. II. Classroom and laboratory study of the hydrometallurgy of copper, lead and zinc. Sulphatizing and chloridizing roasts, leaching, precipitation. Regeneration of solutions, refining precipitates, accessory equipment and process. Electrolitic zinc and lead. Lab. fee $3.00. Prerequisite: Chem. 2b. Mr. Barker.

240. LABORATORY RESEARCH IN COPPER, LEAD, AND ZINC METALLURGY. An advanced study of methods of reduction of the metals covered in outline by courses 123, 125, 127, 133. Investigation of processes, selection of equipment, plant design. Economics of smelting. Individual solution. Lab. fee $3.00 per credit. Mr. Barker.

UN-NUMBERED COURSES

SUMMER INSPECTION TRIPS. Inspection trips of six weeks' duration visiting several of the more important mining or metallurgical centers of the United States and Canada are required for graduation. They should be taken after the junior year.

FIRST AID TRAINING. A week's intensive training in first aid methods for miners. Given in conjunction with the United Sates Bureau of Mines. Required for graduation. Taken in the junior year.

MINE RESCUE TRAINING. A week's intensive training in mine rescue and recovery methods using oxygen breathing apparatus. Given in conjunction with the United States Bureau of Mines. Required in the senior year.

ANNUAL FOUNDRY CONFERENCE. In addition to the regular courses conducted by the Department of Mining and Metallurgy, an annual foundry conference is conducted during the week of February 1 under the auspices of the department. At this conference those engaged in the foundry industry—managers, superintendents, research experts, foremen, etc.—present their problems and discuss them in round table meetings under the leadership of prominent men in the industry. Discussions on cupola practice, sand conditioning, metallography, cost accounting, routing and planning, malleable castings, steel castings, aluminum and light metal castings, heat treatment of steel, sand testing, bronze and brass castings, and defects in castings are features of the conference. In addition to the discussions, laboratory tests and demonstrations are organized. While this work was developed for the industry in Wisconsin, an equally large attendance from outside the State is a regular feature.

RAILWAY ENGINEERING

LESLIE FLANDERS VAN HAGAN, C.E., *Professor of Railway Engineering, Chairman*
WALTER HENRY TACKE, B.S., *Instructor in Railway Engineering*

1. RAILWAY CURVES. I, II; 2 cr. The computation and field location of simple, compound, and spiral curves and railway turnouts. Prerequisites: Trigonometry, elementary surveying. Mr. Van Hagan, Mr. Tacke.

2. THEORY OF RAILWAY LOCATION AND CONSTRUCTION. I; 3 cr. Recitation, lectures, and problems. Prerequisite: Railway 1 or concurrent registration. Mr. Van Hagan, Mr. Tacke.

22. PRACTICE IN RAILWAY LOCATION AND CONSTRUCTION. Two weeks, at the close of the second year, spent in field and office practice. Prerequisites: Railways 1 and 2 and Topographic Engineering 2. Registration fee $9.00; lab. fee $3.00. Mr. Van Hagan, Mr. Tacke.

105. ENGINEERING ECONOMICS. I; 2 cr. The theory underlying the economic selection of materials of construction, methods of doing work, and types of structures. Elective for junior and senior engineers. Mr. Van Hagan.

107. ADVANCED RAILWAY DESIGN. I, II; 2 cr. Special problems of an advanced nature, together with studies and discussions of matters of current interest in connection with railway engineering. Elective for seniors and graduate students. Mr. Van Hagan.

110. MASONRY CONSTRUCTION. II; 2 cr. Theory governing the design and construction of masonry structures. Prerequisites: Mechanics 3, 51. Mr. Van Hagan, Mr. Tacke.

111. SUBSTRUCTURES. II; 1 cr. Ordinary and deep foundation work; lectures and problems. Prerequisite: Railways 110. Mr. Van Hagan.

112. ESTIMATES. II; 2 cr. Practice in scaling quantities and preparing estimates of cost. Prerequisite: Junior standing. Mr. Van Hagan.

ROADS AND PAVEMENTS

(See Highway Engineering and City Planning, page 251)

SHOP LABORATORIES

JAMES MORGAN DORRANS, *Assistant Professor of Mechanical Practice, Superintendent*
RICHARD REX BELL, *Instructor in Mechanical Practice*
BERT BERNARD BRIDGE, *Instructor in Mechanical Practice*
JOHN BOWIE CLULEY, BS., *Instructor in Mechanical Practice*
GEORGE DAVID HITCHCOCK, *Instructor in Mechanical Practice*
NICHOLAS FRANCIS HOLLANDER, *Instructor in Mechanical Practice*
CHARLES FREDERICK PETERS, *Instructor in Mechanical Practice*
THOMAS PUDDESTER, *Instructor in Mechanical Practice*
ROBERT NICHOLAS SCHUMANN, *Instructor in Mechanical Practice*
GEORGE FRANCIS YOUNG, *Instructor in Mechanical Practice*

The following shop laboratory courses are required in Mechanical Engineering: Of freshmen, Courses 1, 2, 4, 5; of sophomores, Courses 6, 13; of juniors, Course 7; of seniors, Course 9. A total of ten credits and six weeks of industrial or mechanical practice are required.

The following shop laboratory courses are required in Electrical Engineering: Course 11 in the freshman and 12 in the sophomore year, a total of four credits.

The following shop laboratory courses are required in Chemical Engineering: Courses 1, 2, 4, 5 in freshman year, a total of four credits.

1. ELEMENTARY PATTERN MAKING. I, II; 1 cr. Bench and lathe work in wood. Principles of molding and core making. A knowledge of common woods. Fee $3.00. Mr. Hollander.

2. BENCH WORK, FORGE, AND WELDING. I, II; 1 cr. Instruction in the use of bench metal tools, acetylene and electric welding, splicing, soldering and drill press work, pipe fitting, forge practice, tempering and brazing. Fee $3.00. Mr. Schumann, Mr. Peters.

4. LATHE WORK IN METALS. I, II; 1 cr. Turning, boring, and thread cutting. Experience in working various metals. Fee $3.00. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

5. PLANING, SHAPING, AND MILLING. I, II; 1 cr. Surfacing, slotting and gear cutting. Fee $3.00. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

6. TOOL MAKING. I; 2 cr. Making and tempering taps, reamers, counterborers, turret lathe tools, etc. Prerequisites: Shop 4, 5. Fee $6.00. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

7. GENERAL SHOP WORK. I; 2 cr. Manufacturing machines, gas engines, etc. Turret lathe practice. Production methods. Prerequisites: Shop 2, 4, 5, 6. Fee $6.00. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

8. ADVANCED SHOP PROBLEMS. II; 2 to 4 cr. Prerequisite: Shop 7. Fee $3.00 per credit. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

9. ADVANCED PATTERN MAKING. II; 1 cr. Building up patterns and core boxes, skeleton construction, type patterns for molding machine work. Prerequisite: Shop 1. Regularly for seniors only. Fee $3.00. Mr. Hollander.

10. INDUSTRIAL OR MECHANICAL PRACTICE. Not less than six weeks of work, performed outside the University, in a shop with a well-developed system of methods pertaining to the manufacture, building, or making general repairs of machinery, machine parts, or metal products. Application for credit must be made upon a form furnished by the adviser, and accompanied by credentials stating the length of service, kind of work and any other pertinent information necessary for granting of this credit by the Mechanical Engineering Course Committee.

11. ELEMENTARY SHOP WORK. I, II; 2 cr. Elementary pattern making, bench metal work, forging, and welding. For freshman electricals only. Mr. Hollander, Mr. Peters, Mr. Schumann.

12. ADVANCED SHOP WORK. II; 2 cr. Lathe work in various metals, shaping, drill-press work, assembling. For sophomore electricals only. Mr. Bell, Mr. Hitchcock, Mr. Puddester.

13. ELEMENTARY FOUNDRY PRACTICE. I, II; 1 cr. Bench molding, floor molding, and machine molding, cupola practice, core making. Fee $3.00 Mr. Bridge, Mr. Young.

14. ADVANCED FOUNDRY PRACTICE. II; 2 cr. Cupola practice, bench and floor work, bronze and white metal alloys. Skin drying and sweep work. Elective for junior and senior engineers. Fee $6.00. Mr. Bridge, Mr. Young.

15. GENERAL FARM CARPENTRY. I, II; 1 or 2 cr. Elective for junior and senior engineers. Fee $3.00. Mr. Cluley.

108. WELDING. I; 2 cr. Acetylene and electric arc welding. Elective for graduates and undergraduates. Fee $6.00. Mr. Peters, Mr. Schumann.

STEAM AND GAS ENGINEERING

GUSTUS LUDWIG LARSON, M.E., *Professor of Steam and Gas Engineering, Chairman*
BEN GEORGE ELLIOTT, M.S., M.E., *Professor of Mechanical Engineering, Extension Division and College of Engineering*
LEROY ALONZO WILSON, M.E., M.M.E., *Associate Professor of Steam and Gas Engineering*
DELMAR WOOD NELSON, M.E., *Assistant Professor of Steam and Gas Engineering*
GROVER C. WILSON, M.S., M.E., *Assistant Professor of Steam and Gas Engineering*
ORVILLE CHARLES CROMER, M.S., *Instructor in Steam and Gas Engineering*
EINAR THEODORE HANSEN, M.S., *Instructor in Steam and Gas Engineering*
ROBERT WILLIAM KUBASTA, B.S., *Instructor in Steam and Gas Engineering*
REED ALDEN ROSE, M.S., *Instructor in Steam and Gas Engineering*

1. THERMODYNAMICS. I; 4 cr. A study of the laws of heat and mechanical energy and their application to air compressors and external and internal combustion engines, followed by a study of fuels and theoretical combustion. Prerequisites: Physics 51, 52; Mathematics 54, 55. Required of junior mechanical engineers. Mr. L. A. Wilson, Mr. G. C. Wilson, Mr. Elliott.

2. THERMODYNAMICS. II; 4 cr. Continuation of S. and G. 1. A study of the laws of vapors and their application to various types of steam engines and turbines, with special attention to the economy and efficiency of various designs of such prime movers. This is followed by the principles of combustion, boilers, power plant auxiliaries, and refrigerating machinery. Prerequisite: S. and G. 1. Mr. L. A. Wilson, Mr. G. C. Wilson, Mr Elliott.

3. THERMODYNAMICS. I; 3 cr. A course in the theory and principles underlying heat engines. This course is similar to course 1 except the study of fuels is replaced by the thermodynamics of vapors. Prerequisites: Physics 51, 52, 53, or 54; Mathematics 54, 55. Required of junior electrical and chemical engineering students. Mr. Nelson, Mr. Rose, Mr. Hansen, Mr. Cromer.

4. THERMODYNAMICS. II; 3 cr. Continuation of S. and G. 3. This course is similar to course 2 except fuels are studied in place of the thermodynamics of vapors. Prerequisite: S. and G. 3. Mr. Nelson, Mr. Rose, Mr. Hanson, Mr. Cromer.

7. THERMODYNAMICS FOR CIVIL ENGINEERS. II; 2 cr. A very abbreviated course in the thermodynamics of gases and vapors and their application to the more important types of steam engines, gas engines, and boilers. Prerequisites: Physics 51, 52; Mathematics 54, 55. Required of junior civil engineers. Mr. Nelson.

100. SENIOR THESIS. I, II; 1-5 cr. May be elected by seniors in Mechanical Engineering.

105. STEAM AND GAS ENGINE CALCULATIONS. I; 2 cr. A course devoted to the calculations used in practice for determining size and the more important details of steam engines, boilers, condensers, cooling towers, etc. Problems are assigned and discussed and solved in the drawing room. Prerequisites: S. and G. 1 and 2, or 3 and 4. Required of senior mechanical engineers. Mr. Larson.

106. STEAM TURBINE CALCULATIONS. II; 2 cr. This study covers theory and elements of design of steam turbines, also practical problems relating to turbine operation. Prerequisites: S. and G. 1 and 2, or 3 and 4. Mr. Larson.

108. HEATING AND VENTILATING. I, II; 3 cr. The principles and the theory of modern systems of heating and ventilating buildings of various types, accompanied by problems involving the design and specifications for such systems. Prerequisites: S. and G. 1 and 2, 3 and 4, or 7. Mr. Larson.

109. INTERNAL COMBUSTION ENGINES. I; 2 cr. The theory and design of gas, gasoline, and fuel oil engines; also such details as carburetion, fuel injection, and ignition. Prerequisites: S. and G. 1 and 2, or 3 and 4. Mr. G. C. Wilson.

110. ADVANCED HEATING AND VENTILATING PROBLEMS. I, II; 3 cr. Special problems taken from heating and ventilating consulting practice. Prerequisite: S. and G. 108. Mr. Larson.

112. REFRIGERATION. II; 2 cr. The theory and principles of refrigeration, including a study of the selection of equipment, the design and specifications of systems, and the properties of various working substances. Prerequisite: S. and G. 2 or 4. Mr. L. A. Wilson.

114. THEORY OF HEAT TRANSFER. II; 2 cr. The theory and design of heat transfer apparatus. This covers heaters and condensers as well as cooling systems for motors or electric generators. Prerequisite: S. and G. 2 or 4. Mr. Larson.

180. SPECIAL READING PROJECT. I, II; 1-3 cr. This course covers some special problem. It may be a commercial investigation, a library study, or a combination of the two. Prerequisite: S. and G. 2 or 4. Mr. Larson.

LABORATORY COURSES

Mr. G. C. Wilson and Laboratory Instructors

22. ELEMENTARY TESTING. II; 2 cr. Calibration of instruments, valve setting, and the determination of the efficiencies and characteristics of simple heat engines. Gas and fuel analysis. Prerequisite: Registration in Steam and Gas 2. Required of juniors in mechanical engineering. Lab. fee $8.00. including laboratory manual.

23. Advanced Testing of Heat Engines. I; 2 cr. Continuation of course 22, covering more complex types of heat engines, including refrigeration machinery, steam turbines, boilers and power plants. Required of seniors in mechanical engineering. Lab. fee $6.00.

25. Elementary Testing. II; 2 cr. Calibration of instruments and the adjustments of simple heat engines. Also, the determination of the efficiencies, losses, and characteristics of simple heat engines, turbines, and internal combustion engines. Prerequisite: Registration in S. and G. 4 or 7. Required of juniors in chemical engineering. Laboratory fee $8.00, including laboratory manual.

26. Advanced Testing of Heat Engines. I; 1 cr. Continuation of course 25, covering more complex types of heat engines, including air compressors, refrigeration machinery, boiler plant, and Diesel engine tests; also air measurement. Required of seniors in chemical engineering. Laboratory fee $3.00.

28. Elementary Testing. II; 2 cr. Covers the same experiments as S. and G. 25, but the laboratory work is somewhat abbreviated and more time is spent on the calculation of results. Prerequisite: Registration in S. and G. 4 or 7. Required of juniors in electrical engineering. Laboratory fee $8.00. including laboratory manual.

29. Advanced Testing of Heat Engines. I; 1 cr. Continuation of course 28, covering more complex types of heat engines including air compressors, refrigeration machinery, boiler plant, and Diesel engine tests. Gas and fuel analysis Required of seniors in electrical engineering. Lab. fee $3.00.

124. Advanced Engineering Testing. II; 1 cr. Continuation of S. and G. 23. Special tests of heat engines, air compressors, gas producers and engines, power plants, and other commercial tests. Required of seniors in mechanical engineering. Prerequisite: S. and G. 23. Lab. fee $3.00.

127. Heat Engine Testing. I; 2 cr. Calibration of instruments, adjustment, determination of losses and efficiencies of heat engines, including the principal types of steam and internal combustion engines and including power plant and refrigeration plant tests. Prerequisites: S. and G. 7, or 3 and 4. Required of seniors in civil engineering. Lab. fee $8.00, including laboratory manual.

128. Heating and Ventilating Laboratory. II; 2 cr. Covers the calibration of heating and ventilating instruments, checking the efficiencies of ventilating systems and air conditioners, comparative tests of unit heaters, and a study of methods for determining air infiltration into buildings. Prerequisite: Completion of a beginning S. and G. laboratory course. Lab. fee $6.00.

130. Internal Combustion Engine Laboratory. II; 2 cr. The calibration and comparison of high speed pressure indicators, the study of air fuel mixtures, efficiency and power tests on motors including aeroplane and automobile engine tests with an electric dynamometer. Prerequisite: Completion of a beginning S. and G. laboratory course. Lab fee is $3.00 per credit.

151. Advanced Steam and Gas Problems. I; 1 to 3 cr. Research or practical problems which can be worked out in the Steam and Gas Laboratory. The student may select his own project and is allowed to work it out on his own initiative with periodic faculty conferences. Prerequisite: Completion of a beginning S. and G. laboratory course. Lab. fee is $3.00 per credit.

152. ADVANCED STEAM AND GAS PROBLEMS. II; 1 to 3 cr. May be a continuation of the project started in course 151 or it may be an entirely different project. The course covers similar problems worked out in the same manner as in S. and G. 151. Prerequisite: Same as for S. and G. 151. Lab. fee is $3.00 per credit.

200. GRADUATE RESEARCH. I, II; 3 to 5 cr. This course covers the major research projects which are carried on for credit toward advanced degrees. Prerequisite: Graduate standing in Engineering. Lab. fee is $3.00 per credit.

STRUCTURAL ENGINEERING

WILLIAM SPAULDING KINNE, B.S., *Professor of Structural Engineering, Chairman*
FREDERICK EUGENE TURNEAURE, C.E., D.Engr., *Dean of the College of Engineering*
WILLARD SHERWIN COTTINGHAM, B.S., *Instructor in Structural Engineering*

2. BRIDGE STRESSES. II; 4 cr. Simple bridge stresses. Four recitations. Prerequisite: Mechanics 1. Mr. Kinne, Mr. Cottingham.

3. BRIDGE DESIGN. I; 3 cr. Roof trusses and plate girders. Prerequisites: Struct. Engr. 2, Mechanics 3. Mr. Kinne, Mr. Cottingham.

4. BRIDGE DESIGN. II; 2 cr. Riveted and pin-connected trusses. Prerequisites: Struct. Engr. 2, 3. Mr. Kinne, Mr. Cottingham.

10. STRUCTURAL DESIGN. I, II; 2 cr. A short general course in the designing of roofs and buildings designed for students in mechanical, electrical, and mining engineering. Prerequisites: Mechanics 1, 3. Mr. Kinne, Mr. Cottingham.

105. REINFORCED CONCRETE. I; 3 cr. Principles of reinforced concrete construction; analysis and problems in design. Prerequisites: Mechanics 1, 3. Mr. Turneaure, Mr. Kinne, Mr. Cottingham.

106. REINFORCED CONCRETE. I; 2 cr. Design and analysis of reinforced concrete arches. Prerequisites: Mechanics 1, 3. Mr. Kinne.

107. BRIDGE STRESSES. I; 3 cr. Statically indeterminate structures. Analysis of swing, cantilever, arch, and suspension bridges. Prerequisites: Struct. Engr. 2. Mr. Kinne.

108. BRIDGE STRESSES. II; 2 cr. Advanced theory and experimental work. Secondary stresses in framed structures. Tests on bridges under moving loads. Prerequisites: Struct. Engr. 2, 107. Mr. Turneaure.

109. BRIDGE DESIGN. II; 2 cr. Swing bridges. Design of truss turntable, and operating machinery for railway swing bridges. Prerequisites: Struct. Engr. 2, 3, 4, 107. Mr. Kinne.

111. REINFORCED CONCRETE. II; 2 cr. Analysis and problems in design. A continuation of Struct. Engr. 105, which is prerequisite. Mr. Kinne.

112. HIGHWAY BRIDGES AND CULVERTS. II; 2 cr. Design and analysis of highway bridges and culverts. Elective for senior civil engineers and graduates in civil engineering. Prerequisites: Struct. Engr. 2, 3, 4, 105. Mr. Kinne.

213. SPECIAL PROBLEMS. I, II; 1 to 3 cr. Special problems in the analysis of higher structures. Mr. Turneaure, Mr. Kinne.

TOPOGRAPHIC ENGINEERING

RAY SPRAGUE OWEN, B.S., *Associate Professor of Topographic Engineering, Chairman*

FRANKLIN THOMPSON MATTHIAS, B.S., *Instructor in Topographic Engineering*

1. ELEMENTARY SURVEYING. I; 2 cr. The work consists of the practice and theory of pacing, taping and leveling. Lab. fee $4.50. Mr. Owen, Mr. Thrapp.

2. ELEMENTARY SURVEYING. II; 2 cr. A continuation of course 1 including the field and office work of a variety of practical problems in the adjustment and use of the engineer's level, compass, and transit. Lab. fee $4.50. Mr. Matthias, Mr. Thrapp.

3. LAND SURVEYING. I; 3 cr. The field work consists of the adjustment and use of the transit, sextant, and plane table in problems relating to land surveying and the making of a city plat. In class the theory involved in above field work is covered, including effect on results, of lack of adjustment, and instrumental inaccuracies, and their elimination, also the methods used in original land and city surveys and resurveys. Practice is given in the computation arising from the common problems of land surveying. Special emphasis is placed on methods of computation and arrangement of data. The office work of platting the field notes and making finished maps follows the field work. Prerequisites: T. E. 2 and trigonometry. Lab. fee $3.00. Mr. Owen.

104. ADVANCED SURVEYING. II; 3 cr. Mining, topographic, and hydrographic surveying, stream gauging, and field astronomy. The classroom work includes the methods and computation relating to above subjects while the field work consists of solar and stellar observations, and topographic surveys, with finished maps. Prerequisite: T. E. 3. Lab. fee $4.50. Mr. Owen.

106. SUMMER SURVEY CAMP. Four weeks at the close of the school year are spent in the field and office practice while in camp at Devils Lake, Wisconsin. An area of several square miles is surveyed and mapped, based upon a careful triangulation with base line measurement. In addition students carry on both river and lake surveys, including the gauging of the Baraboo River, both by current and rod floats. The survey begins the week preceding Commencement and is required of all civil engineers. Prerequisite: T. E. 104 or its equivalent. (Six weeks with Railways 22.) Average cost to student $100.00 for six weeks, including fees, board, and spending money. Mr. Owen, Mr. Wesle, and instructors.

108. SHORT COURSE IN SURVEYING. I, II; 3 cr. Planned to meet the demands of electrical and mechanical engineering students for a general study of the subject, including the use of transit, level, and tape, and the principles of topographic, hydrographic, and land surveys, also the drawing of profiles and computation of areas. Prerequisite: Trigonometry. Reserved for sophomore electrical engineers the first semester. Open to all qualified students the second semester. Lab. fee $4.50. Mr. Matthias.

109. RAPID TOPOGRAPHY SUMMER CAMP. Adapted for training topographers for the United States Geological Survey. Practice is had in the use of the plane table in the sketching of topography. Prerequisite: T. E. 106. Registration and lab. fee $6.00 per credit.

COLLEGE OF AGRICULTURE

C. L. CHRISTENSEN, DEAN

PLAN OF THE COLLEGE

The work of the College is conducted on a three-fold basis. Each department aims:

First, to give instruction to students at the University;

Second, to develop science through investigation and experiment;

Third, to disseminate information among the farmers and farm women of the state by means of publications, farmers' courses, institutes, and the agricultural extension service.

The College of Agriculture is one of the general divisions of the University. Instruction in the general sciences, languages, and mathematics is given to agricultural and home economics students in the College of Letters and Science; but for the purely agricultural and home economics subjects, separate buildings, equipment, and staff of instructors are maintained. Students at this college have the same standing as students of other colleges and have the advantages incident to a large university, such as the general laboratories, libraries, and student organizations. Aside from the purely instructional work of the College, the facilities for research afford special opportunities for both regular and advanced students to secure a knowledge of the best methods in agriculture and home economics.

EQUIPMENT

BUILDINGS

The buildings occupied by the College of Agriculture are located at the west end of Observatory Hill. They have been erected and equipped with particular attention to the special needs of the work in the various departments.

The administrative offices of the College and Experiment Station, Agricultural Extension and Farmers' Institutes, lecture rooms, laboratories, and offices for several of the departments are located in Agricultural Hall. At the rear of the main building is a large wing which furnishes quarters for the library and reading room or the ground floor. The second and third floors are occupied by an auditorium with a seating capacity of 750, which is used primarily for general assemblies.

West of the main building is a group comprised of Hiram Smith Hall, the Dairy Laboratory, and the Mailing room.

The Soils Building, with greenhouses adjoining, provides lecture rooms and laboratories for the instructional and research work of the department, as well as offices for the instructional and research work of the department, as well as offices for the State Soil Survey.

The Agronomy, Horticulture, and Plant Pathology Departments are located in one building, which, with the adjoining greenhouses, is provided with modern equipment for instruction and research in these subjects.

The Genetics Building contains the departments of Genetics and Veterinary Science.

The Agricultural Engineering Building provides offices, lecture and drafting rooms, power and farm machinery laboratories, a laboratory for the smaller farm tools and implements, and a concrete construction laboratory.

The Department of Agricultural Chemistry is located in the Agricultural Chemistry Building. It contains large laboratories, and an assembly room with seating capacity of 400, in addition to special laboratories for advanced students and the chemistry laboratories of the Experiment Station, including those of the feed and fertilizer inspection service.

The Department of Home Economics is located in the Home Economics Building, where offices, classrooms, and laboratories are provided, and in the practice cottage where the work in household administration, house decoration, and dietetics has ample scope for practical solution. The department is provided with all the necessary furnishings and apparatus to give thorough instruction in the subjects of house sanitation, art and design, food preparation, dietetics, textiles, sewing, dressmaking, house decoration, and institutional economics.

The Live Stock Pavilion provides a large arena which is used for stock judging work and exhibition purposes. The pavilion has seating arrangements for 2,500 people. Beneath the amphitheater seats there are stalls for the housing of horses belonging to the University Farm. In addition to this there are offices, operating room, and dispensary for Veterinary Science.

The Poultry Building provides offices and classrooms. Pens of all of the important breeds are provided and practical instruction is given in all lines of poultry raising. A separate research poultry plant is maintained on an outlying portion of the University Farm. The Economic Entomology Department has a building by itself.

The University Farm buildings include barns for the horses, cattle, sheep, and swine as well as two large stock judging rooms. Other buildings are provided for storing farm machinery, silage, manure, and tobacco.

A group of small buildings formerly devoted to the manufacture of hog cholera serum is now being used for the testing of commercial serums and for investigational work in diseases of livestock.

LIBRARY

The Agricultural College Library includes about 33,000 bound volumes and 28,000 pamphlets relating to agriculture and home economics. This library is a part of the general University Library, but is kept in special quarters in Agricultural Hall, so as to be readily available to students in this College. It is especially strong in the files of scientific agricultural journals, both American and foreign, and the record books of pure-bred animals. A trained librarian and assistants are in attendance to aid students.

FARM LANDS

The College of Agriculture is provided with four farms, the University Farm, Eagle Heights Farm, Gregg Farm, and the Hill Farm, totaling about 846 acres of tillable land. These farms are operated to facilitate both instruction and research in agriculture.

LIVE STOCK

The University herds and flocks represent the principal breeds of dairy and beef cattle, draft-horses, swine, sheep, and poultry, including many individuals that are well-known prize winners.

COURSES OF INSTRUCTION

GRADUATE COURSES offer to advanced students opportunities for professional training and original investigation, made possible through an active Experiment Station, associated with numerous scientific laboratories. The special lines of study in agriculture and home economics are left largely to the selection of the student. Students may participate in experiments in progress and, after suitable experience, conduct independent investigations. When contributions to knowledge of permanent value are made they may be published through the bulletins with proper credit to the contributor.

LONG COURSE IN AGRICULTURE OR HOME ECONOMICS. These four-year courses leading to the degree of Bachelor of Science embrace general training in chemistry, physics, bioolgy, bacteriology, and other branches which have applications in agriculture or home economics. The fields are so broad, however, that it is impossible for the student to pursue in four years all the technical courses offered, in addition to acquiring the necessary fundamental studies, and hence much liberty of election is allowed.

MIDDLE COURSE IN AGRICULTURE, leading to the title of Graduate in Agriculture, consists of two full college years and is planned especially for those who wish greater specialization in agriculture with less of general scientific training.

COURSES FOR THE TRAINING OF TEACHERS. Graduates of the four-year courses in Agriculture or Home Economics who fulfill the special educational professional requirements will be entitled to receive a special license to teach agriculture, home economics, or the vocation of home making, and a general license to teach other subjects. See pages 372 and 349 of this catalog.

SUMMER SESSION COURSES include work in agricultural bacteriology, agricultural chemistry, agricultural economics, agricultural education, agricultural engineering, agronomy, animal husbandry, dairying, plant pathology, poultry, soils, and home economics. The home economics work includes courses in art and design, millinery, food study and cookery, dietetics, research in nutrition, teaching home economics, sociological study of the family, and extension work.

SHORT COURSE IN AGRICULTURE. This course, consisting of two winter sessions of fifteen weeks each, is provided for those who can devote only a limited time to study and who, therefore, desire the greatest amount of directly useful knowledge that can be acquired in the brief time allowed. This course begins about November 15 and closes about March 15. An illustrated circular describing this course may be had on request to Prof. V. E. Kivlin, College of Agriculture, Madison, Wis.

WINTER DAIRY COURSE. This course is open to persons who have had at least six months' experience in a creamery or cheese factory and covers two terms of six weeks each, beginning about November 1. The course is designed to train creamery butter makers and factory cheese makers in the science and practice of their respective lines. Certificates are given to those who satisfactorily complete the full course and who have worked in a creamery or cheese factory for two seasons of not less than seven months each, one before and the other after the period spent in the Dairy Course. An illustrated circular describing this course in detail will be sent upon application to Prof. H. C. Jackson, College of Agriculture, Madison, Wis.

SUMMER DAIRY COURSE. This course is intended for beginners or those having little practical knowledge of creamery or dairy work. Students are admitted at any time during the spring and summer after March 1. They are expected to remain at least ten weeks, although they may continue the work longer, if desirable. Laboratory exercises and theoretical instruction are given as required.

EXTENSION COURSES GIVEN ON THE CAMPUS

FARMERS' WEEK. This is a popular course of addresses, demonstrations and exercises, covering a period of one week, designed to give busy farmers the most useful instruction and practice in the science of agriculture in the shortest possible time at a season when they can be away from home for a brief period. This course early in February, is given by the staff of the College of Agriculture, assisted by other speakers. Programs may be had upon application to Prof. K. L. Hatch, College of Agriculture, Madison, Wis.

WOMEN'S WEEK IN HOME ECONOMICS. This course for one week is designed to give women practical and helpful instruction in the various phases of home economics. The plan of instruction includes lectures and demonstrations in all phases of home management. The course is held at the same time as the Farmers' Week to afford an opportunity for farmers' wives and daughters to attend. Detailed information will be furnished upon request to Prof. Abby L. Marlatt, Department of Home Economics, Madison, Wis.

SPECIAL DAIRY COURSE. This is a one-week course of lectures, conferences, and demonstrations, designed to meet the needs of creamery and cheese factory operators and managers, and give them advanced instruction in connection with problems of management of their establishment as well as to inform them on recent advances in the science of dairying. The course is held at the time of the Farmers' Week. A special course for Cow Testing Association men is held at the same time. Detailed programs may be secured upon application to Prof. H. C. Jackson, College of Agriculture, Madison, Wis.

YOUNG PEOPLE'S WEEK. A week's course of lectures, demonstrations, and exercises which are of interest to farm boys and girls is held each year during Commencement week. Those who have won scholarships in Boys' and Girls' Club Work, pursue this course. Each day, special classes for the girls in attendance will be held at the Department of Home Economics. For further information, address Prof. T. L. Bewick, College of Agriculture, Madison, Wis.

RURAL CHURCH SUMMER SCHOOL. A course of lectures, discussions and demonstrations is held during the first two weeks of the University Summer Session. It is especially designed to be of service to town and open-country ministers and includes the entire field of rural social and economic work. For information and circular write Prof. J. H. Kolb, College of Agriculture, Madison, Wis.

AGRICULTURAL EXPERIMENT STATION

As the Wisconsin Agricultural Experiment Station is organically associated with the College of Agriculture, members of the college faculty constitute the staff of the Station. The purpose of the Station is the promotion of agricultural science by research and experimentation, and funds for the work come from both state and federal appropriations. Each of the several departments has research continually in progress, some members of the staff devoting the major portion of

their time to investigations dealing with the problems of the farmer. As far as facilities permit, the subjects selected for research are those of greatest practical importance to Wisconsin farmers.

The publications of the Experiment Station include an annual report and a series of popular bulletins, research bulletins, and poster bulletins. Popular bulletins, including helpful discussions on results of experiments, are issued in editions of 20,000 to 50,000 copies and are distributed free to residents of the state upon application; the research bulletins contain technical data and discussions not designed for wide distribution and are sent to libraries, investigators, etc. Apply for the popular bulletins to Chris L. Christensen, Director, Madison, Wis.

AGRICULTURAL EXTENSION SERVICE

The extension work of the College of Agriculture is organized to co-ordinate and extend departmental service among Wisconsin farmers, and farm women, spreading and disseminating information gathered in laboratory and field plot. Under this service three lines of work are carried on:

1. Field demonstration work of the several departments.

2. The county agricultural or home demonstration agent system in which a resident instructor is located in a county.

3. Collective extension instruction given in connection with the farmers' weeks and women's schools, demonstration trains, etc.

Through such instruction and practical demonstrations many thousands of rural people who are unable to come to Madison for resident instruction are aided directly by the College. Many of the extension activities are organized on the project basis, and are partly supported by federal funds. This work is in home economics as well as in the field of agriculture. For printed matter and other information regarding this work, apply to K. L. Hatch, Associate Director.

FARMERS' INSTITUTES

The Department of Farmers' Institutes of the College of Agriculture is maintained by a legislative provision which appropriates $30,000 annually for the purpose of conducting Farmers' Institutes at various places throughout the state. In the year July 1, 1929 to July 1, 1930, 672 two-day and one-day institutes and single session meetings were held. The Department also held 183 special farmers' co-operative marketing institutes, with consideration of such commodities as American cheese, foreign cheese, butter, and eggs.

Persons desiring institutes in their communities should write to E. L. Luther, Superintendent, for application blanks and other information.

ORGANIZATIONS

Several societies maintained by the agricultural students meet frequently to discuss questions related to their special interest. These organizations are for drill in parliamentary practice and training in debate, as well as for the discussion of scientific and practical questions. The Euthenics Club is an organization of students in Home Economics to promote intellectual and social intercourse and stimulate greater interest in vital problems of the day. The Saddle and Sirloin Club is a student organization of those interested in animal husbandry; the Grafter's Club for those interested in horticulture; and the Apis Club for students of entomology.

An Agricultural Experiment Association with a paid membership of about 1,000 is maintained for the purpose of co-operating with the College and Experiment Station in advancing the agriculture of the commonwealth. By means of this organization, the members of which are located in all sections of the state, the College is in close touch with the great body of Wisconsin farmers.

A chapter of the national honorary agricultural fraternity, Alpha Zeta, and a chapter of the national honorary home economics sorority, Omicron Nu, are maintained by faculty and student members. The students publish a monthly magazine, *The Country Magazine,* under the direction of the Department of Agricultural Journalism.

ADMISSION REQUIREMENTS

The general requirements for admission are set forth in Part III of this announcement, beginning with page 33.

STUDENT EXPENSE

Fees, tuition, personal expenses, scholarships, loan funds, self-support, etc., are discussed in Part II of this announcement, beginning with page 15.

FEES AND TUITION IN SPECIAL COURSES

	Lab. Fee and Deposit	Non-resident Tuition	General Fee
Short Course—three terms of five weeks each, per term	4.50	17.22	3.34
Infirmary fee, per three terms			2.50
Gymnasium fee, per three terms			1.50
Memorial Union fee, per student			1.00
Winter Dairy Course—twelve weeks	13.00	41.33	9.50
Summer Dairy Course—five weeks	7.00	17.25	6.00

CURRICULA IN AGRICULTURE

Students of the Long and Middle Courses must take 16 to 18 credits each semester, exclusive of military science, physical education, or band instruction, except during the first semester of the freshman year, when only 14 credits are required. Electives may be added to make a total of 20 credits, provided the student has received a grade of at least B in each subject for the preceding semester. All students, including seniors, must carry at least 16 credits each semester unless excused by the Executive Committee. Before being graduated from either of these courses, the student must have had farm experience satisfactory to the department in which he majors.

THE LONG COURSE

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (AGRICULTURE)

The general requirement for graduation in the Long Course is 133 credits and 133 grade-points in addition to convocation and military science, physical training, or band instruction. At the beginning of the sophomore year the student chooses as adviser a member of the department in which he expects to major.

Students in the Long Course who wish to qualify for the University Teachers' Certificates are referred to page 290 for a statement of the requirements.

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Math. 71—Mathematics for agricultural students	4	Botany 1—General botany	5
An. Husb. 1—Livestock production, or	3	Agron. 1—General farm crops	3
Agron. 1—General farm crops	(3)	or	
Convocation	0	An. Husb. 1—Livestock production	(3)
Physical activity requirement	0	Physical activity requirement	0
	15		16

Students will elect their animal husbandry or agronomy in the first semester and the alternative subject in the second semester. Upon approval of the Executive Committee, a student may substitute for Mathematics 71 some other course in mathematics.

SOPHOMORE YEAR

Agr. Bact. 1—General survey	5		Agr. Econ. 1—Principles of agr. econ.	3
Soils 1—Soil fertility	5	—or—	Agr. Chem. 1, 2—Elem. biochemistry	5
Econ. 1a—General economics	4		Agricultural option	3
Agricultural option	3		Botany 146, Physiology 3, or substitute	4
Electives	1-6		Electives	1-8
Physical activity requirement	0		Physical activity requirement	0
	16-18			16-18

Students majoring in the following departments will take the following subjects instead of Botany 146 or Physiology 3:

Agricultural Economics, Dairy Husbandry—Economics 1b.
Agricultural Journalism—Rural Sociology 25.
Agricultural Engineering—Advanced mathematics.
Agricultural Education—Three credits in the Department of Education.
Rural Sociology—Sociology 1.

JUNIOR YEAR

Science or mathematics	5	Science or mathematics	5
Electives in College of Letters and Science	5	Electives in College of Letters and Science	5
Major and electives	6-8	Major and electives	6-8
	16-18		16-18

SENIOR YEAR

Major and electives	16-18	Major and electives	16-18

The ten credits of chemistry, zoology, physics, geology, geography, botany, physiology or mathematics in addition to that of the freshman year, as shown in the junior year, are taken outside the College of Agriculture, and are to be fundamental to the major.

The 10 credits of electives in the College of Letters and Science shall include a minimum of 5 credits in language (German, French, Italian, Spanish), English, philosophy, psychology, sociology, political science or history.

Each student shall complete a minimum of 50 credits in the College of Agriculture, including required agricultural courses, options, majors and electives.

The major consists of a minimum of 15 or a maximum of 25 elective credits in a department, but certain courses outside a given department may be counted in the major if reported in advance to the faculty. Courses in other colleges taken as a part of the major do not count as agriculture to meet the 50-credit requirement. A thesis, if required, must represent some phase of the student's work in the field of his major, for which a total of 4 credits will be allowed.

AGRICULTURAL OPTIONS

Sophomores in the Long Course must choose two courses from the following group. Only one subject in a given department can be counted as an option in meeting this requirement, but subjects not chosen as options may later be taken as electives.

Agr. Engr. 1—Land surveying and drainage	3	Dairy 1—Introduction to dairying	3
Hort. 1—Principles of fruit growing	3	Hort. 3—Vegetable gardening	3
Poultry 1—Poultry raising	3	Econ. Ent. 1—Farm insects	3
Vet. Sci. 1—The animal body	3	Agr. Engr. 5—Farm field machinery	3

THE MIDDLE COURSE

LEADING TO THE TITLE OF GRADUATE IN AGRICULTURE

This course is designed to meet the needs of students who have had a high-school training but who cannot spend more than two years at the university. Requirements for admission are the same as for the Long Course.

The total requirements for graduation in the Middle Course are 64 credits and 64 grade-points. All Middle Course students are required to take convocation and two full years of physical training, military science, or band instruction.

A maximum of ten elective credits may be taken outside the College of Agriculture. Subjects of the Long Course taken in the College of Letters and Science and not required in the Middle Course are considered electives outside the College of Agriculture.

Students taking the Middle Course and desiring to transfer to the Long Course must be prepared to spend more than the usual four years in order to complete the requirements.

This course gives the maximum opportunity for choosing work for a vocational objective. Students should have an objective in mind when entering the course and plan their work so prerequisites may be taken for all courses desired. Early in the first semester the Assistant Dean should be consulted concerning objectives and future courses desired. Dairy manufacturing, poultry, animal husbandry, horiculture, or farm crops are usual fields of specialization, but others may be made.

FRESHMAN YEAR

	Credits		Credits
Engl. 1a—Freshman composition	3	English 1b—Freshman composition	3
Chemistry 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Elective	6	Electives	8
Convocation	0	Physical activity requirement	0
Physical activity requirement	0		
	14		16

SOPHOMORE YEAR

Electives	17	Electives	17
Physical activity requirement	0	Physical activity requirement	0
	17		17

CURRICULA IN HOME ECONOMICS

ABBY L. MARLATT, DIRECTOR, PROFESSOR OF HOME ECONOMICS

The Department of Home Economics offers courses dealing with the principles underlying the proper management of the home, the care of children, the hygienic and sanitary conduct of institutions, and the economic conditions affecting the work of women. The courses are planned to meet the needs of four classes of students:

1. Those who desire a general knowledge of the subject matter of home economics as part of a general education. A wide range of electives in Letters and Science is possible in the general course. Home Economics may also be taken as a minor with the major leading to a B.A. degree.

2. Those who desire to make a detailed study of home economics in preparation for a professional career other than teaching.

3. Those who wish to teach home economics in secondary schools, vocational schools, extension courses, and institutions of higher learning.

4. Graduate students who have the requisite knowledge to benefit by research work in subjects connected with the home.

GENERAL REQUIREMENTS

The degree of Bachelor of Science, Home Economics Course, is conferred upon those who complete a four- or five-year major in home economics. A total of 120 credits and 120 grade-points is required for graduation, or 124 credits when a teachers' certificate is desired. Two years of physical education are also required. Sixteen credits exclusive of physical education may be elected each semester, with the privilege of increasing to 18 credits provided the student has received a grade of B or higher in each subject for the preceding semester. All students, including seniors, must elect a schedule of at least 14 credits each semester, unless given permission by the Executive Committee to carry a reduced schedule.

At least 8 credits in foreign language beyond beginning courses are required of all students except those entering with 4 high-school units in one language or a total of 5 units in two languages. Students entering with 2 or more units of a foreign language are expected to continue that language for 8 credits, but such students desiring to change to another language or those entering with less than 2 units are required to take 16 credits in one foreign language, the first 8 credits of which are counted as electives.

In the Course in Home Economics a student must have at least 25 grade-points and 25 credits before she may become a sophomore, at least 58 grade-points and 58 credits before she may become a junior, and at least 88 grade-points and 88 credits before she may become a senior.

No student who does not earn at least one grade-point per credit during the last two semesters of residence will be recommended for a degree.

All students entering the College of Agriculture with advanced standing of two or more credits in Home Economics are not required to take Home Economics 9, 1 credit.

A student given partial credit by the Advanced Standing Committee in any required subject, and who shall complete a more advanced required course in some other department for which the partially credited course is a prerequisite, shall be permitted to substitute electives to make up deficiencies in credits in the required course.

MAJORS

The requirements for a major in Home Economics are not less than 18 nor more than 40 credits in strictly home economics subjects. A minimum of 12 credits or a maximum of 32 in strictly home economics subjects, inclusive of the thesis, may be taken during the junior and senior years. Home Economics 2, 9, and 109 are general courses in art and on the family, required of all majors in Home Economics. They are not counted in either the minimum or maximum credits for the major, but are included in the 120 required for graduation. The teachers' courses, 52, 53, 158, and 194, may be elected and counted not only toward the 120 required for graduation, but also as part of the 124 credits necessary for receiving the University Teachers' Certificate; they are not, however, considered as home economics electives.

The majors which lead to professional work in the field of home economics are: (1) teaching in home economics, (2) food major—either hospital dietitian or institutional management, (3) textile major, (4) applied bacteriology major, (5) nursing or hospital administration major, (6) major in related art, (7) major in home economics journalism. There is also a non-professional course which allows a wide latitude in the choice of a major.

THESIS

All candidates for a degree present a thesis or a thesis substitute. A thesis must represent original work upon some subject which has been arranged after consultation with the student's adviser and the head of the department in which the work is done. On the advice of the major professor, course 80 may be taken for 4 credits to count as a thesis substitute, and at her direction the finished typewritten report may be deposited in the University Library as a thesis or retained in the departmental office.

MINORS FOR LETTERS AND SCIENCE STUDENTS

A minor in Home Economics is not less than 10 or more than 20 credits in home economics subjects. The following may be elected:

(1) The minor in foods must include Home Economics 1a-b, and other related courses; such as 47, to make 10 to 20 credits. The teaching minor includes Home Economics 52.

(2) The minor in clothing and textiles must include Home Economics 2, 5, 10, 11, and other courses to complete 15 credits. The textile teaching minor may include courses 2, 5, 10, 11, 50, 97, 52, 53, and other vocational and related courses to make 20 credits.

(3) The minor in housing problems is intended to be taken with a major or minor in sociology so that those intending to do the work of sanitary inspector, visiting housekeeper, or visiting teacher, or other social welfare work, will have a broad foundation knowledge of the fundamental problems in housing conditions as well as fundamentals in home and budget making for a family. This minor includes Home Economics 1a, 1b, and other related courses.

(4) The minor in related art is intended to be taken by home economics general majors, majors in home economics journalism, and majors in Art Education. A minor in related art must include courses elected from the following list to complete 15 credits: Home Economics 2, 12, 8, 18, 20, 93, 94, 95, 114, 116, 121, 194.

NON-PROFESSIONAL COURSE IN HOME ECONOMICS

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (HOME ECONOMICS)

This course is planned for students who do not wish to be trained in the professional home economics majors, and therefore is less severely technical and allows a more liberal choice of electives. Science requirements and required credits in home economics are greatly reduced; but, on the other hand, a student may elect much more freely in any college after she has taken certain fundamental home economics subjects.

The same number of credits are required for graduation in the Non-professional Course in Home Economics as for the Bachelor of Arts degree. Students are expected to earn 14 to 16 credits per semester, making an average of 30 credits per year, or 120 credits and 120 grade-points for the course. In addition the student is required to take physical education during the first two years, and convocation is required for the first half of the first semester of the freshman year.

From 48 to 58 credits may be chosen by the student in any college in addition to the 10 credits which she is required to elect in the College of Letters and Science. Not more than 22 of these credits may be elected in home economics subjects, such election being dependent on having selected the necessary prerequisites. It is wise to select electives with a definite goal in mind so that at graduation intensive study will have been made in some one subject or related subjects.

General majors interested in becoming costume designers, interior decorators or textile designers should, in addition to the fundamental courses offered in Home Economics, avail themselves of the opportunities offered in the Departments of Art History and Art Education.

If the student taking the non-professional course elects carefully in the courses in education and psychology during her undergraduate work, she may enter as a graduate student qualifying for nursery school teaching.

To make such plans it is desirable that the student plan the desired electives with her faculty adviser as early as possible in the sophomore year. The required work of this general major is as follows:

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Foreign language (second year)	4	Foreign language (second year)	4
Chem. 1a—General chemistry	5	Home Econ. 3—Introduction to food study	3
Home Econ. 9—Introduction to home economics	1	Chem. 1b—General chemistry	5
Home Econ. 2—Art and design	3	Physical education	0
Convocation	0		
Physical education	0		
	16		15

SOPHOMORE YEAR

Engl. 30 or 33—English literature	3-2	Electives	15
Home Econ. 5—Introduction to textile study	3	Physical education	0
Electives	10		
Physical education	0		
	15-16		15

In addition to 10 credits of chemistry, 4 to 6 credits of science are required during the freshman and sophomore years, to be selected from the list below. Upon approval of the Executive Committee a student may substitute one of these optional sciences for Chemistry 1b.

Agr. Bact. 4—Household bacteriology... 5
Agr. Chem. 3—Household chemistry..... 5
Physics 65—General physics 6
Physiol. 1—Elements of human physiology 4

JUNIOR YEAR

Home Econ. 7—House architecture and sanitation 2
Home Econ. 17—House architecture lab. 2
Electives 11
15

Electives 15
15

SENIOR YEAR

Home Econ. 80 or 100..... 2
Home Econ. 110—Household administration 2
Home Econ. 112—Household admin. lab. 2
Electives 9
15

Home Econ. 80 or 100..... 2
Home Econ. 109—Humanics..... 4
Electives 9
15

Students taking the non-professional course may take journalism as a major and the following major is typical of others that may be arranged.

MAJOR IN HOME ECONOMICS JOURNALISM

In addition to the courses required for the first two years of the non-professional major, the following courses should be elected in the sophomore year: Home Economics 20, Costume design; Home Economics 1a, Elementary dietetics; and Agricultural Journalism 8, Writing home economics news.

JUNIOR YEAR

Home Econ. 7, 17—House architecture... 4
Home Econ. 10—Clothing economics 2
Journ. 2—Newspaper reporting 3
Electives 7
16

Agr. Journ. 106—Advertising survey ... 2
Agr. Journ. 111—Writing farm home features 2
Home Econ. 18—House decoration lab... 2
Electives 10
16

SENIOR YEAR

Home Econ. 104—History of costume.... 2
Home Econ. 110—Household admin. 2
Home Econ. 112—Household admin. lab.. 2
Home Econ. 126—Extension course 2
Journ. 3—Copy reading 3
Home Econ. 80 or 100—Thesis..... 2
Electives 3
16

Journ. 123—Women's departments 2
Agr. Journ. 103—Publicity methods..... 2
Soc. 140—Principles of sociology..... 3
Home Econ. 80 or 100—Thesis..... 2
Electives 7
16

Electives—students in this major are urged to use their electives in taking courses in economics, seciology, and home economics.

PROFESSIONAL COURSES IN HOME ECONOMICS

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (HOME ECONOMICS)

The professional majors are seven in number and are as follows:

1. The general professional major (see page 280) may be taken as a teaching major for secondary or vocational schools, for home economics extension, general home economics commercial consultant, and for all professional types of work where foods, clothing and textiles, household administration, etc., are needed as a preparation;
2. Professional majors in foods (see page 282) leading to positions as hospital dietitians or in institutional management;
3. Clothing and textiles (see page 283);
4. Related art (see page 284);
5. Applied bacteriology (see page 284);
6. Nursing or hospital administration major (see page 285).
7. Home economics Journalism (see page 279).

These majors are technical in nature with a large background of science. The first two years are common to all professional majors and are as follows:

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Foreign language (second year)	4	Foreign language (second year)	4
Chem. 1a—General chemistry	5	Chem. 1b—General chemistry	5
Home Econ. 9—Introduction to home economics	1	Home Econ. 3—Introduction to food study	3
Home Econ. 2—Art and design	3	Physical education	0
Convocation	0		
Physical education	0		
	16		15

SOPHOMORE YEAR

Physics 65—General physics	3	Physics 65—General physics	3
Home Econ. 5—Introd. to textile study	2	Home Econ. 50—Textiles	3
Agr. Chem. 3—Household chemistry	5	Agr. Bact. 4—General survey	5
Physiol. 1—Elements of physiology*	4	Electives	4
Elective	2	Physical education	0
Physical education	0		
	16		15

*Five-year nursing course majors should substitute Physiology 4, six credits.

GENERAL PROFESSIONAL MAJOR

The junior and senior years of this major offer the possibility of 28 elective credits if the high-school language is continued, giving in four years 34 free electives out of 120 credits required for the Bachelor of Science degree. This major may be taken as a general education, or may be directed towards teaching, extension, commercial work, social welfare, home economics journalism, etc. The requirements of the junior and senior years are as follows:

JUNIOR YEAR

Home Econ. 4—Problems of food supply	3	Home Econ. 6—Nutrition and dietetics	2
Home Econ. 7, 17—House architecture and sanitation	4	Home Econ. 16—Dietetics laboratory	2
Home Econ. 10—Clothing economics	2	Home Econ. 18—House decoration laboratory	2
Home Econ. 20—Costume appreciation and selection	2	Home Econ. 11—Problems in clothing construction	3
Electives	4	Electives	6
	15		15

SENIOR YEAR

Home Econ. 110, 112—Household administration	4	Home Econ. 109—Humanics	4
Home Econ. 80 or 100	2	Home Econ. 80 or 100	2
Electives	10	Electives	10
	16		16

TEACHING HOME ECONOMICS IN HIGH SCHOOLS AND GRADES. For the high-school teaching major in home economics a total of 124 credits and 124 grade points is required for graduation. It is desirable that electives be grouped for a definite purpose such as a teaching minor in addition to the home economics teaching major. Teaching minors may be chosen in the various departments; a minor varies from 10 to 20 credits of work chosen for a distinct purpose in a single department. The following minors have proved very satisfactory in connection with a home economics teaching major: chemistry, bacteriology, mathematics, modern language, physiology, physics, sociology, journalism, education. Students in the sophomore year should discuss the matter of majors in home economics and minors in other departments with their faculty advisers.

REQUIREMENTS FOR TEACHERS' CERTIFICATES. Students receiving the degree in the home economics professional major and taking additional work in education to make 124 credits for graduation, will receive the degree of Bachelor of Science (Home Economics and Education) and will be entitled to receive the University Teachers' Certificate upon recommendation of fitness by the Department of Home Economics and upon completing as a part of their elective work the following courses: Education 31, Principles of education, 3 credits; Educ. Psych. 75, Psychology and practice of teaching, 5 credits; Home Economics 52, 4 credits; elective in the Department of Education, 3 credits; making a total of 15 credits. Home Economics 53, Clothing methods, is also required of all candidates for the University Teachers' Certificate who are planning to teach clothing.

Students entering with advanced standing in Home Economics 52 must take Home Economics 158; credit in Home Economics 52 is required of all. Persons not desiring to qualify for a teachers' certificate but wishing a general course in home economics may omit the teacher training courses.

Students desiring to qualify for the University Teachers' Certificate should register with the Director of the School of Education during the first semester of the junior year. They will find it advantageous to select an additional subject in which they may qualify under the head of a minor, so that when they are placed in small high schools they will be equipped to teach not only their major subject of home economics, but also a minor subject. A suggested list of minors includes mathematics, English, modern language, history, Latin, physiology, physics, chemistry, botany, and biology. The selection of a minor should be made as early in the course as possible so that the free electives may be utilized to best advantage.

VOCATIONAL SCHOOL CERTIFICATE. Upon completion of a course of training in a professional major, including the 15 credits for the teachers' certificate and summer school courses in vocational education, and upon recommendation of fitness by the Department of Home Economics, the student will be certified to the State Board of Vocational Education, which, on approval of the student's record, will issue a certificate as instructor in vocational courses in homemaking.

In addition to the four-year course, the candidate for the teachers' certificate in vocational education is expected to have practical experience in house management; therefore between the junior and senior years the student should spend the vacation period in practical home management, reporting details of the work to the instructor in charge of the household administration class. Study of standards is provided at the practice cottage, which is a laboratory in connection with the Home Economics Department.

EXTENSION IN HOME ECONOMICS. The extension major in home economics follows the general plan of the teaching major, substituting for the required courses in education electives in psychology, rural sociology, agricultural journalism and agricultural economics.

A suggested minor in agriculture is as follows: 10 credits to be chosen from Rural Sociology 25, 126; Agricultural Journalism 8, 111; Horticulture 3, 8; Agricultural Education 5; Economic Entomology 1, Poultry Husbandry 1.

COMMERCIAL CONSULTANT IN GENERAL HOME ECONOMICS. A student who wishes to become a commercial consultant in this field should include in her four-year course at least 10 credits of electives in economics, sociology, or journalism, as a preparation for work with public utilities, food companies, newspapers, magazines, etc.

SOCIAL WELFARE WORK. If a home economics graduate plans to enter social welfare work, she should elect a minor in sociology which includes Economics 1a and two courses from each of the following groups to make a total of 15 credits:

Group A—Sociology 1, 139, 172, 197
Group B—Sociology 2, 141, 161, 177

HOME ECONOMICS JOURNALISM. To prepare for newspaper writing on home economics subject matter the electives taken with the general professional major requirements may be Agricultural Journalism 8, 106, 111; Journalism 123.

MAJOR IN FOOD AND NUTRITION

The major in food and nutrition is planned to meet the demands for trained dietitians in hospitals, Red Cross nutrition service, child health workers in social welfare associations, consultant dietitians in medical clinics, dietitians in cafeterias, tea rooms, and public schools, and research assistants in experiment stations. The schedule for the first two years is found on page 280.

In the first semester of the junior year majors in institutional management will take Home Economics 22 for 2 credits. Hospital dietitians are advised to elect Chemistry 20 and 21 in the first or second semester of the junior year and Physiological Chemistry 104 in the senior year or the summer session. Those wishing to teach should elect two additional clothing courses and the required education courses in the junior year.

JUNIOR YEAR

Home Econ. 4—Problems of food supply	3	Home Econ. 6—Nutrition and dietetics	2
Home Econ. 7, 17—House architecture and sanitation	4	Home Econ. 16—Dietetics laboratory	2
Electives	8	Electives	11
	15		15

SENIOR YEAR

HOSPITAL DIETITIAN

Home Econ. 110, 112—Household admin.	4	Home Econ. 109—Humanics	4
Home Econ. 125—Dietotherapy	3	Home Economics elective or Chemistry	2
Home Econ. 80 or 100	2	Home Econ. 80 or 100	2
Home Economics elective or Chemistry	2	Free electives	7
Free electives	4		
	15		15

INSTITUTIONAL MANAGEMENT (124 CREDITS)

The institutional major elects fewer science courses and more economics and sociology courses, with applied economic work along food, marketing, and equipment studies. The total credits are the same for the teaching major.

Home Econ. 110, 112—Household administration	4	Home Econ. 109—Humanics	4
Home. Econ. 134—Institutional equipment and furnishing	2	Home Econ. 133—Tea room and restaurant management	3
Home Econ. 80 or 100	2	Home Econ. 122—Organization and administration of institutions	2
Electives	8	Home Econ. 80 or 100	2
		Electives	5
	16		16

MAJOR IN CLOTHING AND TEXTILES

The following schedule in the major in clothing and textiles is planned to meet the needs of the student who expects to teach clothing and textiles. Students who elect a minor in sociology may prepare themselves for social work and those wishing to go into store work may elect courses in economics and salesmanship which will fit them for such positions. Those preparing for costume design work should take added courses in fine and applied arts and history.

Students without teaching experience should take two food courses to prepare for general home economics teaching.

Home Economics electives are to be selected from the following courses: 1a, 4, 6, 16, 20, 32, 96, 103, 104, 106.

JUNIOR YEAR

Home Econ. 7, 17—House architecture and sanitation	4	Home Econ. 8—House decoration	2
Home Econ. 10—Clothing economics	2	Home Econ. 18—House decoration lab.	2
Electives	9	Home Econ. 11—Problems in clothing construction	3
		Electives	8
	15		15

SENIOR YEAR

Home Econ. 110, 112—Household admin..	4	Home Econ. 109—Humanics	4
Home Econ. 53—Clothing methods	2	Home Economics electives	2
Home Econ. 80 or 100	2	Home Econ. 80 or 100	2
Home Econ. 97—Adv. problems in design	2	Free electives	7
Free electives	5		
	15		15

MAJOR IN RELATED ART

The related art major includes courses in home furnishing, costume design, applied design, clothing and foods. It gives preliminary training for commercial positions as advisers in home furnishing departments, as editors of women's sections in magazines and papers, as professional costume designers (after further art training), and as interior decorators and furnishers. *This is not a teaching major for grades or high schools.*

Students preparing for editorial work should elect a journalism minor; those preparing for professional costume designing should elect additional courses in clothing and in applied arts; and those preparing for interior decorating and house furnishing work should elect Home Econ. 114, Studies and practice in interior decorating and furnishing, 2 credits, and Home Econ. 116, Seminary in interior decorating and furnishing, 4 credits.

All students in this major should elect Art Education 50 and 51, Freehand drawing, 6 credits, during the sophomore or junior year. In the senior year four credits in advanced courses in foods or clothing must be taken.

JUNIOR YEAR

Home Econ. 7, 17—House architecture..	4	Home Econ. 8, 18—House decoration	4
Home Econ. 20—Costume appreciation and selection	2	Home Econ. 94—Advanced applied design	3
Home Econ. 95—Hand loom weaving	1	Electives	9
Electives	8		
	15		16

SENIOR YEAR

Home Econ. 110, 112—Household administration	4	Home Econ. 109—Humanics	4
Home Econ. 80 or 100	2	Home Econ. 80 or 100	2
Electives	9	Electives	9
	15		15

MAJOR IN APPLIED BACTERIOLOGY

Students may include beyond their sophomore year, see page 280, such detailed work in applied bacteriology as will equip them to become bacteriological technicians in the various laboratories maintained in connection with municipal water and sewage plants, manufactories of biological products, and milk plants, as well as with public health laboratories, hospital laboratories, private laboratories, in physicians' offices, and in laboratories in connection with public and private sanatoria. There is a demand for such technicians, and many of the home economics graduates have found the work both attractive and stimulating. The major consists of a minimum of 19 credits, including the required courses in bacteriology and the thesis. Electives may be chosen from the following:

Agr. Bact. 125—Food bacteriology	3
Agr. Bact. 200—Research	2
Agr. Bact. 231—Seminary	1
Agr. Bact. 100—Thesis	2
Path. 102—Medical bacteriology	5
Zool. 111—Micro-technique	3
Agr. Bact. 121—Dairy bacteriology	3
Agr. Bact. 200—Research	2
Agr. Bact. 231—Seminary	1
Agr. Bact. 100—Thesis	2
Vet. Science 126—Infection and immunity	3
Zool. 119—Animal parasites	3

JUNIOR YEAR

Home Econ. 4—Problems of food supply	3
Home Econ. 7, 17—House architecture and sanitation	4
Electives	9
	16
Home Econ. 6—Nutrition and dietetics	2
Home Econ. 16—Dietetics laboratory	2
Electives	12
	16

SENIOR YEAR

Home Econ. 110, 112—Household administration	4
Electives	12
	16
Home Econ. 109—Humanics	4
Chem. 113—Water analysis	1
Electives	11
	16

NURSING OR HOSPITAL ADMINISTRATION MAJOR

The five-year combined course in home economics and nursing leads to the degree of Bachelor of Science (Home Economics) and to the Certificate of Graduate Nurse. The requirements are as follows:

FRESHMAN AND SOPHOMORE YEARS

Students take the required work as outlined for the general professional majors on page 280, except that English 33a for 2 credits and Psychology 1 for 3 credits take the place of electives in the sophomore year.

JUNIOR YEAR

Home Econ. 7 and 17—House architecture and sanitation	3
Home Econ. 47—Diet problems in feeding children	3
Engl. 33b—Introduction to English literature	2
Nursing 1—Elementary principles	2
Electives	5
	15
Home Econ. 6—Nutrition and dietetics	2
Home Econ. 16—Dietetics laboratory	2
Home Econ. 22—Marketing and large quantity cookery	2
Home Econ. 133—Tea room and restaurant management	3
Electives	7-8
	15-16

Either Anatomy 120 or Physiology 4 must be elected during the junior year.

Following the junior year in the College of Agriculture, the professional course consists of 27 months in residence in the Nurses' Dormitory. During this period the student has instruction in medicine, surgery, and principles of nursing, ward practice in the wards and out-patient department of the hospital, and practical training in public health nursing. The resident course is divided into four half years of academic and professional education and three additional months of special training. In each half year there are one semester of four months of academic and ward work, six weeks (52 hours per week) of ward or field work, and two weeks of vacation. A complete outline of this work may be found under School of Nursing, page 342.

DEPARTMENTS OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
I, II—semester course given each semester
cr.—number of credit hours per semester
*—to be arranged

Courses numbered from 1 through 100 are open for credit to under-graduates only; from 101 to 199 to both undergraduates and graduates; over 200 to graduates only, or very exceptionally to advanced undergraduates.

AGRICULTURAL BACTERIOLOGY

EDWIN GEORGE HASTINGS, M.S., *Professor of Agricultural Bacteriology, Chairman*
EDWIN BROUN FRED, Ph.D., *Professor of Agricultural Bacteriology*
WILLIAM DODGE FROST, Ph.D., D.P.H., *Professor of Agricultural Bacteriology*
IRA LAWRENCE BALDWIN, Ph.D., *Associate Professor of Agricultural Bacteriology*
ELIZABETH MCCOY, Ph.D., *Assistant Professor of Agricultural Bacteriology*
WILLIAM BOWEN SARLES, Ph.D., *Assistant Professor of Agricultural Bacteriology*
MILDRED A. ENGELBRECHT, M.S., *Instructor in Agricultural Bacteriology*
HARRY EDWIN SAGEN, M.S., *Instructor in Agricultural Bacteriology*

Students majoring in this department may take Medical Bacteriology 102 or 104 or Veterinary Science 126, and count five of these credits toward the major requirement.

1. GENERAL SURVEY OF BACTERIOLOGY. I; 5 cr. The relation of micro-organisms to soil fertility, to animal diseases, and to food. Prerequisite: Chemistry 1a. Required of all agricultural students. Lab. fee $6.75. Mr. Sarles.

2. GENERAL SURVEY. II; 4 cr. The relation of micro-organisms to chemical transformations, especially as regards their relation to water, food, sewage disposal, and industrial processes. For chemistry course students. Prerequisite: Chemistry 1b. Lab. fee $6.75. Mr. Sarles.

4. GENERAL SURVEY. II; 5 cr. Survey of bacteriology with special emphasis on the relation of micro-organisms to foods and domestic sanitation. One out-of-town class trip taken. Prerequisite: Chemistry 1a. Required of students in home economics. Lab. fee $6.75. Mr. Frost, Miss Engelbrecht.

100. THESIS. Yr; 2 cr. A definite problem in dairy, soil, or household bacteriology or in animal diseases. Prerequisites: Agr. Bact. 1, 2, or 4, and consent of instructor. Lab. fee $2.25 per lab. cr. Staff.

121. Dairy Bacteriology. II; 3 cr. The bacteriology of milk production and distribution and of dairy manufacturing. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Hastings.

123. Soil Bacteriology. II; 3 cr. The relation of micro-organisms to soil fertility. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Fred.

125. Food Bacteriology. II; 3 cr. The microbiology of foods and of industrial fermentations. Prerequisite: Agr. Bact. 1, 2, or 4 or Medical Bacteriology 102. Lab. fee $4.50. Miss McCoy.

126. Physiology of Bacteria. I; 3 cr. The chemistry and physics of bacterial processes. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $4.50. Mr. Baldwin.

130. Determinative Bacteriology Yr; 2-5 cr. Training in the common methods of the bacteriological laboratory. Prerequisite: Agr. Bact. 1, 2, or 4, or Medical Bact. 102. Lab. fee $2.25 per lab. cr. Mr. Frost, Miss Engelbrecht.

200. Research. Yr; 2-5 cr. A detailed study of a definite problem in the field of agricultural bacteriology. Prerequisites: Agr. Bact. 121, and 123, 124, 125, or 130. Lab. fee $2.25 per lab. cr. Staff.

231. Seminary. Yr; 1 cr. Discussion of the research work of the department and of current problems in the fields covered by the department. Staff.

AGRICULTURAL CHEMISTRY

Edwin Bret Hart, B.S., *Professor of Agricultural Chemistry, Chairman*
Karl Paul Link, Ph.D., *Professor of Biochemistry*
William Harold Peterson, Ph.D., *Professor of Agricultural Chemistry*
Harry Steenbock, Ph.D., *Professor of Agricultural Chemistry*
William Edward Tottingham, Ph.D., *Associate Professor of Agricultural Chemistry*
Conrad Arnold Elvehjem, Ph.D., *Assistant Professor of Agricultural Chemistry*
Blanche Marye Riising, B.S., *Instructor in Agricultural Chemistry*

The courses offered in this department are intended to give a broad view of biological chemistry useful to the general agricultural student, and to develop men fitted for instructional or experimental work in the various fields of chemical activity applied to agriculture. Courses 120 and 122 are for students desiring a more detailed knowledge of the special subjects treated and are preliminary to greater specialization. These courses should be preceded or accompanied by work in biology and organic chemistry. Physiology and bacteriology are desired prerequisites. All other advanced courses in this department are open to undergraduates and graduates who have had the necessary preliminary training.

1. Elementary Biochemistry. II; 3 cr. Introduction to the chemistry of living matter. A general discussion of the composition, the nutritional requirements, and the metabolism of plants and animals. Prerequisite: Chemistry 1b or concurrent registration. Mr. Elvehjem.

2. Elementary Biochemistry Laboratory. II; 2 cr. Qualitative and quantitative chemical analysis applied to agricultural materials. Prerequisite: Credit or concurrent registration in Agr. Chem. 1. Lab. fee $4.50. Mr. Elvehjem.

3. HOUSEHOLD CHEMISTRY. I; 5 cr. Composition, properties, and nutritive value of foods; chemistry of the home, cleaning materials, etc. Required of all home economics students. Prerequisite: Chemistry 1b. Lab. fee $6.75. Mr. Peterson.

100. THESIS. Yr; 2 cr. May be taken in plant, animal, fermentation, or dairy chemistry. Lab. fee $2.25 per lab. cr. Staff.

120. PLANT CHEMISTRY. II; 2 or 5 cr. The mechanism and course of chemical processes in the growth of plants, including the effect of environmental factors. Selected methods for the determination of plant constituents. Prerequisites: Chemistry 1b and 120. Lab. fee $2.25 per lab. cr. Mr. Tottingham.

121. DAIRY CHEMISTRY. I; 2 or 5 cr. The chemistry of milk and its products, including the chemistry of fermentation and detection of adulterants. Prerequisites: Chemistry 1, 12, and 120. Lab. fee $2.25 per lab. cr. Mr. Hart.

122. ANIMAL CHEMISTRY. I; 2 or 5 cr. The chemistry of carbohydrates, fats, proteins, and other nutrients, and the metabolic changes involved in human and animal nutrition. Prerequisites: Chemistry 12 and 120. Lab. fee $2.25 per lab. cr. Mr. Steenbock.

124. BIOCHEMICAL METHODS. I; 1-3 cr. A survey of important analytical processes used in the study of biochemical problems. Prerequisites: Chemistry 12, 120, and Agr. Chem. 120, 121, or 122. Lab. fee $2.25 per lab. cr. Mr. Elvehjem.

125. THE VITAMINS. II; 1 cr. Lectures and laboratory work on the vitamins, including the animal technique used in their identification. Prerequisite: Agr. Chem. 122. Lab. fee $2.25. Mr. Steenbock.

126. MODERN VIEWS OF ANIMAL NUTRITION AND THEIR APPLICATION. II; 2 cr. A course of lectures and conferences on the newer knowledge of nutrition applied to man, poultry, dairy cattle, swine, etc. Prerequisite: Agr. Chem. 122. Mr. Hart.

127. FERMENTATION BIOCHEMISTRY. II; *cr. Lectures and laboratory work on the chemistry and bacteriology of fermentation. Lab. fee $2.25 per lab. cr. Mr. Peterson, Mr. Fred.

128. CARBOHYDRATE CHEMISTRY. I; 2 cr. Lectures on the structural and theoretical relationships of the simple sugars, sugar alcohols, and polysaccharides. Laboratory work on the carbohydrates is available by arrangement under course 200. Prerequisite: Chemistry 120. Mr. Link.

200. RESEARCH. Yr; *cr. Carbohydrate and plant chemistry. Mr. Link. Plant nutrition and plant metabolism, Mr. Tottingham. Fermentation biochemistry, Mr. Peterson. Animal chemistry and animal nutrition, Mr. Hart, Mr. Steenbock, Mr. Elvehjem. Dairy chemistry, Mr. Hart. Lab. fee $2.25 per lab. cr.

233. SEMINARY. Yr; 1 cr. Original articles of importance are studied in detail, to broaden and deepen the understanding and to act as a stimulus to further research. Mr. Hart and staff.

AGRICULTURAL ECONOMICS

BENJAMIN HORACE HIBBARD, Ph.D., *Professor of Agricultural Economics*
ASHER HOBSON, Ph.D., *Professor of Agricultural Economics, Acting Chairman*
PRESTON ESSEX MCNALL, M.S., *Professor of Agricultural Economics*
GEORGE SIMON WEHRWEIN, Ph.D., *Professor of Agricultural Economics*
RUDOLPH KNUGAARD FROKER, M.A. *Associate Professor of Agricultural Economics*
DONALD SHERMAN ANDERSON, M.S., *Assistant Professor of Agricultural Economics*
HENRY HARRISON BAKKEN, M.A., *Assistant Professor of Agricultural Economics*
JOHN SWEET DONALD, B.S., D.D.S., *Assistant Professor of Agricultural Economics*
ISAAC FULTS HALL, Ph.D., *Assistant Professor of Agricultural Economics*
AUSTIN CLAIR HOFFMAN, M.S., *Assistant Professor of Agricultural Economics*
WILLIAM P. MORTENSON, Ph.D., *Assistant Professor of Agricultural Economics*
MILES CHARLES RILEY, LL.B., *Lecturer in Agricultural Economics*
MARVIN ARNOLD SCHAARS, M.S., *Instructor in Agricultural Economics*
CARL FREDERICK WEHRWEIN, Ph.D., *Instructor in Agricultural Economics*

The courses in agricultural economics are intended to give the students a knowledge of the economic principles which relate to the production and marketing of farm products, and to the economic conditions of the agricultural classes. As such, it is a field of general interest to all concerned with farmers and their welfare.

There are two methods of taking agricultural economics. First, it may be taken as a joint major along with work in one or more other departments, economics being recognized as a phase of farming coordinate with many other lines of inquiry; second, agricultural economics may be taken as a full major by those who decide to make it a main line of study preparatory to teaching, research, or work of an economic character.

Students are advised to take Economics 1a and 1b, Agricultural Economics 1 and 8 in the sophomore year; Agricultural Economics 14, 117, 128, 155, and 179 in the junior year; and Agricultural Economics 10, 107, 126, 127, and 152 in the senior year. This sequence gives the desired background for graduate work.

A curriculum in Agricultural Commerce gives a background in agricultural science as well as training in economics and business practice. See special bulletin of the College of Agriculture.

1. PRINCIPLES OF AGRICULTURAL ECONOMICS. II; 3 cr. Application of economics to agriculture. Required of all agricultural students. Prerequisite: Economics 1a. Mr. Hibbard.

8. FARM RECORDS AND ACCOUNTS. II; 2 cr. Inventories, bookkeeping, and accounting principles as applied to farm operations. Mr. Mitchell.

10. FARM ORGANIZATION AND MANAGEMENT. II; 3 cr. Farm methods and practices as applied to business management on the farm. Prerequisite: Junior standing. Mr. McNall.

14. FARM BUSINESS AND LEGAL PRACTICE. II; 3 cr. Mr. Riley.

100. THESIS. Yr; 2 cr. Staff.

107. FARM COST ACCOUNTING. II; 2 cr. Farm costs analyzed. Operating and financial statements taken up as basis for study of economics of accountancy. Prerequisite: Agricultural Economics 8 or equivalent. Mr. McNall.

117. Outlines of Land Economics. I; 3 cr. This course undertakes to cover the theoretical principles underlying landed property, including the theories of rents, taxation, and conservation, together with the leading facts of land utilization. Prerequisite: Economics 1a. Mr. Wehrwein.

126. International Trade in Agricultural Products. I; 3 cr. Review of theories of international trade and foreign exchange; history of foreign trade in agricultural products; analysis of imports and exports; current international trade problems in their relation to American agriculture. Prerequisite: Economics 1a. Mr. Schaars.

127. Cooperative Marketing. II; 3 cr. An analysis of marketing organizations, methods, and theory underlying cooperative and private enterprises. Current agricultural marketing problems together with a consideration of the economic, legal, and social aspects of cooperative marketing. Governmental relations and selected phases of the cooperative movement will be considered. Prerequisite: A course in marketing or concurrent registration. Mr. Bakken.

128. Marketing Agricultural Products. I; 3 cr. Development of agricultural marketing; services, agencies, methods; emphasis on principles and practices; price factors; commodity exchanges; current marketing problems; governmental relations; marketing costs. Prerequisite: Economics 1a. Mr. Schaars.

129. Cooperative Management Problems. II; 2 cr. The business structure of cooperative associations engaged in commercial activities; problems involving membership relations, internal control, director's responsibilities, management, trade and sales practices, and administrative policies. Prerequisites: Agricultural Economics 127 or concurrent registration. Mr. Hobson.

152. Farmer Movements. I; 2 cr. A discussion of the great farmer movements, such as the Grange, the Alliance, and the American Farm Bureau Federation. Prerequisite: Agricultural Economics 1. Mr. Hibbard.

155. Prices of Agricultural Products. II; 3 cr. An analysis and interpretation of the factors affecting the prices of agricultural products, together with a study of price movements, trends, cycles, and minor fluctuations. The interrelationship of price, demand, and supply of various types of agricultural products. Attention given to the interpretation of materials contained in public and private outlook reports. Prerequisite: Agricultural Economics 1. Mr. Mortenson.

179. Urban Land Economics. II; 3 cr. Urbanization and localization, and structure of cities, urban land utilization, home ownership and tenancy, housing and credit, zoning, city and regional planning. Prerequisite: Economics 1b. Mr. Wehrwein.

180. Topical Work. Yr; *cr. Staff.

200. Research. Yr; *cr. Cooperation and marketing, Mr. Bakken and Mr. Schaars. Farm surveys and financial accounts in their relation to farm management, Mr. McNall. Cost accounting and its relation to farm management, Mr. McNall. History of agricultural production, Mr. Hibbard. Farmer movements, taxation, and farm credit, Mr. Hibbard. Land economics and land problems, Mr. Wehrwein. Agricultural prices and statistics, Mr. Mortenson. International agricultural relations, Mr. Hobson.

221. LAND INCOME. II; 3 cr. The economic characteristics of land; the economics of land utilization with reference to costs and income; theories of rent; valuation and taxation of land. Prerequisite: Graduate standing. Mr. Wehrwein.

226. LAND PROBLEMS. Yr; 2 cr. Land tenure and utilization of the principal countries studied in a two year cycle; the new countries, including the United States (1933-34); the countries with a feudal heritage (1932-33). Mr. Hibbard, Mr. Wehrwein.

228. SEMINARY: HISTORY OF MARKETS AND MARKETING. II; 2 cr. A study of the historical development of markets from early continental fairs, including the economic principles involved; inquiry into the practices and customs of auctions, clearing houses, exchanges, and boards of trade; the emergence of modern sales agencies operating under cooperative, private, and governmental initiative. Prerequisite: Graduate standing. Mr. Bakken.

229. ADVANCED AGRICULTURAL ECONOMICS. Yr; 2 cr. The fundamentals of economics in their application to agricultural problems. Recent works in English, German, and French will be used. Prerequisite: Graduate standing. Mr. Hibbard.

252. SEMINARY: INTERNATIONAL AGRICULTURAL RELATIONS. II; 2 cr. An examination of international agricultural organizations and institutions, and their activities, together with an analysis of national agricultural measures and their influences in the international sphere. Mr. Hobson.

255. PRICE ANALYSIS. II; 3 cr. The application of statistical methods involved in isolating and analyzing agricultural price problems. Stress will be placed on proper interpretations. Prerequisite: Economics 130 or equivalent. Mr. Mortenson.

AGRICULTURAL EDUCATION

JOHN AMBROSE JAMES, B.S., *Professor of Agricultural Education, Chairman*
KIRK LESTER HATCH, B.S., *Professor of Agricultural Education*
THOMAS LYMAN BEWICK, M.S., *Professor of Agricultural Extension*
WARREN WILLIAM CLARK, B.S., *Associate Professor of Agricultural Extension*
VINCENT EARL KIVLIN, M.S., *Assistant Professor of Agricultural Education*
IVAN GLEN FAY, B.S., *Assistant Professor of Agricultural Education*

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete a major and certain elective courses in animal husbandry, poultry, dairying, agronomy, horticulture, soils, agricultural engineering, agricultural economics, and agricultural journalism as a background of agriculture and also the fifteen credits in education required for the University Teachers' Certificate as outlined below. The major consists of a minimum of fifteen elective credits in any department in the College of Agriculture but preferably in Agricultural Education where twelve of the credits for the teachers' certificate are a portion of the major, thus allowing for greater choice of electives.

Students completing the requirements for graduation in Agriculture as suggested above and qualifying for a University Teachers' Certificate will receive the degree Bachelor of Science (Agriculture and Education) and a license to teach issued by the State Superintendent of Public Instruction. Such students must (a) register for the certificate in the School of Education at the beginning of the junior year, (b) receive the recommendation of the teacher training committee of the College of Agriculture, (c) complete the following courses:

	Credits
Educ. 31—Principles of secondary education	3
Educ. Psych. 75—Psychology and practice of teaching	5
Agr. Educ. 1—Rural education	2
Agr. Educ. 128—Program building in vocational agriculture	2
Agr. Educ. 50—Teaching of agriculture	3
	15

Students beginning work for a certificate may arrange their courses most satisfactorily by starting to meet the requirements during the second semester of the sophomore year or the first semester of the junior year. Education 31 and Educ. Psych. 75 should definitely be completed before the beginning of the senior year. During the senior year the three courses in agricultural education are prescribed. This provides the best sequence and one which interferes least with technical subjects. Students should secure a list of the desirable technical agricultural elective courses from the chairman of the Department of Agricultural Education, and discuss with him the requirements for the certificate.

Graduates of professional courses in the state teachers' colleges who are majoring in agriculture and who wish to qualify for the University Teachers' Certificate, should elect 8 credits as follows:

	Credits
Education (advanced)	3-4
Agricultural Education (advanced; or 50)	3
Agricultural Education 128	2

Candidates may be excused from the departmental teachers' course with the approval of the Chairman of the Department of Agricultural Education.

MAJOR. Not more than 5 credits in education taken in Letters and Science may count on the major in agricultural education. These 5 credits shall in no way be counted as a portion of the 50 credits required in the strictly agricultural subjects.

There is a demand for men trained as principals and superintendents for rural communities and small cities. Teachers' college graduates and others with teaching experience are urged to consider this opportunity. The opportunity for electives outside this college makes it possible to take many courses in the Department of Education and thus to prepare for this field.

1. RURAL EDUCATION. II; 2 cr. Origin and development of vocational education for rural communities. Problems, principles, and practices of rural education. For future leaders, farmers, and teachers. Open to sophomores. Mr. James.

5. JUNIOR EXTENSION. I; 2 cr. Place of boys' and girls' clubs in rural education. Educational values, methods of organization, leadership, meetings, demonstrations, follow-up materials, exhibits and reports. For prospective extension workers and teachers. Lectures and demonstrations. Mr. Bewick.

25. RURAL LIFE (Rural Soc. 25). I; 3 cr. Counts as part of education major. Mr. Kolb.

50. TEACHING OF AGRICULTURE. I, II; 3 cr. Directed teaching based upon participation in agricultural activities of the Wisconsin High School, problems of subject matter and methods of teaching. Open only to seniors registered for a teachers' certificate. Mr. Kivlin.

100. THESIS. Yr; 2 cr. Original work on problems of agricultural extension or teaching. Staff.

103. SEMINARY. I, II; *cr. Special problems in rural education and educational problems of county agent, demonstrator, extension workers, teachers, and rural leaders. Mr. James.

110. TRAINING COURSE FOR COUNTY AGENTS. II; 2 cr. Development and administration of the county agent system. The agent's responsibilities to the federal and state governments and the community. Projects, plans for work, and county organization; relation of college specialists and local organization. Open only to seniors and graduate students. Mr. Clark.

128. PROGRAM BUILDING IN VOCATIONAL AGRICULTURE. I, II; 2 cr. Factors determining the program of work, directed practice, part-time and evening schools, etc., adapted to teaching agriculture in secondary schools. Prerequisites: Agr. Educ. 1 and senior standing. Mr. Kivlin.

200. RESEARCH. Yr; *cr. Topical work relative to problems of elementary, vocational, or college agricultural education; extension, county agent, or demonstration work. Mr. James, Mr. Clark.

AGRICULTURAL ENGINEERING

EDWARD RICHARD JONES, M.S., *Professor of Agricultural Engineering, Chairman*
FLOYD WALDO DUFFEE, B.S., *Professor of Agricultural Engineering*
OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*
FRED BENJAMIN TRENK, M.S., *Instructor in Agricultural Engineering (Forestry)*
STANLEY ARTHUR WITZEL, C.E., *Instructor in Agricultural Engineering*

The undergraduate courses in this department are service courses for students majoring in other departments, as well as the basis for advanced work of majors in agricultural engineering, both the non-technical and the technical.

The laboratories are well-equipped with farm machinery, engines and tractors for the study of general mechanical principles. Some of the laboratory work is given in the fields of the university farms. The university marsh of 100 acres of tile-drained land is an excellent drainage laboratory.

Students inclined toward engineering and desiring to return to their farms or to take positions as agricultural agents or farm managers or to enter the farm equipment business, are advised to major in non-technical engineer-

ing, which has no special requirement in mathematics. They are advised to take, in addition to their major studies, liberal electives in soils, agronomy, agricultural economics, and business methods. A major in non-technical agricultural engineering may be combined with a University Teachers' Certificate giving the legal qualifications to teach in the high schools.

Those desiring to enter the more technical fields of mechanical, electrical, civil, or structural engineering as applied to agriculture, are recognized as majors in technical agricultural engineering, and are requested to consult the department chairman before or during the first semester of the freshman year so that the proper sequence of studies in mathematics, drawing, and mechanics may be followed, substituting Mathematics 51 for Mathematics 71. In addition to the required courses in the College of Agriculture the student takes Mathematics 52, 54, and 55; Drawing 1, 2, and 3; Mechanics 1, 2, and 3; and Physics 51 and 52. Graduating from agriculture at the end of four years, it is possible for these men to finish the course in civil, mechanical, or electrical engineering with about three semesters of additional work. This gives them thorough training in pure engineering, which, in addition to an agricultural background, is so essential to professional agricultural engineers. These men are in keen demand by rural power, construction and reclamation companies and the manufacturers of farm machinery and equipment. A circular on technical agricultural engineering will be sent on request.

Throughout the year the majors in both technical and non-technical agricultural engineering function as a student branch of the American Society of Agricultural Engineers, and during the first semester of either the junior or senior years they take Agricultural Engineering 121.

1. Land Drainage. I; 3 cr. Principles, practices and economics of land drainage. Design of drainage systems, computation of gradients, tile testing, and water measurement. Subdivision of land, levelling, chaining, plane-table mapping, contours, and profiles. Engineering students previously trained in topographic surveying substitute additional drainage work. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Jones.

2. Farm Structures. I; 3 cr. Requirements of farm buildings and their economical design, including the house, animal and machinery shelter, feed and vegetable storage, and other farm structures. Wall insulation, heating, lighting and ventilation. Water supply, sewage disposal and concrete construction. Lab. fee $2.25. Mr. Jones.

3. Gas Engines. I; 3 cr. Construction and operation of gasoline engines; farm electric light plants and electric motors; power transmission. It is desirable to have this course preceded by Shop 2. Lab. fee $4.50. Mr. Duffee.

5. Farm Field Machinery. II; 3 cr. Lectures and laboratory studies on the construction and operation of tools and machinery for preparing the seed bed, sowing and planting, tilling and harvesting farm crops. Optional subjects for all agricultural students. Lab. fee $2.25. Mr. Duffee.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab cr. Staff.

101. Drainage Design. II; 2 cr. Preliminary and final surveys and designs for farm and community drainage systems near Madison and other convenient places. Optional work is provided for those specializing in irrigation. Field work and conferences by appointment. Prerequisite: Agr. Engr. 1 or Top. Engr. 1 and 2. Mr. Jones.

103. Farm Tractors. II; 3 cr. Laboratory tests of gas engines and field practice with farm tractors. Prerequisite: Agr. Engr. 3. Lab. fee $4.50. Mr. Duffee.

105. Belt and Tractor Machinery. II; 2 cr. Threshers, silo fillers, and other belt-driven farm machines, large and small; tractor plow; machinery calibration tests. Lectures, laboratory studies, and field demonstrations. Prerequisites: Agr. Engr. 5 and 103 or concurrent registration. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Duffee.

121. Seminary. I; 1 cr. Review of current literature and studies of agricultural engineering problems. For juniors, seniors and graduate students. Mr. Jones and staff.

180. Special Problems. Yr; *cr. Open to technical majors who have had prerequisite training for advanced work in farm machinery, farm power, farm structures, land clearing, drainage or forestry. Lab. fee $2.25 per lab. cr. Staff.

200. Research. Yr; *cr. Agricultural Engineering problems for students qualifying for advanced degrees. Lab. fee $2.25 per lab. cr. Mr. Jones, Mr. Duffee, Mr. Witzel.

AGRICULTURAL JOURNALISM

Andrew Winkle Hopkins, B.L., *Professor of Agricultural Journalism, Chairman*
William Allison Sumner, M.Ph., *Associate Professor of Agricultural Journalism*
Waida Gertrude Gerhardt, B.S., *Instructor in Agricultural Journalism*
Grace Langdon, M.A., *Instructor in Agricultural Journalism*
Rupert Henry Rasmussen, M.S., *Instructor in Agricultural Journalism*

The ability to write simple, understandable English is invaluable to the teacher, extension worker, county and home demonstration worker, and farmer. To render the greatest service the technically trained worker must use the printed page. Selling and advertising are important in the neglected half of farming—the business side. More and more farmers are coming to appreciate the need of salesmanship, sales letter writing, effective classified and display advertisement, and systematic sales campaigns.

For students returning to the farm, Agricultural Journalism 1 and 3 are suggested. For prospective teachers and extension workers, courses 1, 3 and 103 are recommended. For research workers and future college staff workers Agricultural Journalism 1, and 103 are advised.

Majors in the department will be expected to take Agricultural Journalism 1, 2, 3, 100, 103, 111, 150. Courses in the Department of Journalism in the College of Letters and Science may be taken and not to exceed 5 credits from the following courses may count on the major: Journalism 2,

Newspaper reporting and correspondence; Journalism 3, Copy reading; and Journalism 7, Community newspaper.

Home Economics students majoring in the department will be expected to take Agricultural Journalism 8, 103, 106, 111, and 150. The following courses in the School of Journalism may be taken and counted toward the major: 2, Newspaper reporting; 3, Copy reading; and 123, Women's departments in newspapers and magazines. See Curriculum page 162.

1. WRITING FARM NEWS. I; 3 cr. An elementary course to help students who expect to write news articles about farming for publication in the weekly or daily papers or the various agricultural journals. Mr. Sumner.

2. PRACTICE IN EDITING. I, II; 1 cr. The editorial, business, and circulation problems of the Wisconsin Country Magazine are analyzed and actual practice given on the magazine. Mr. Sumner.

3. AGRICULTURAL ADVERTISING. II; 3 cr. How to write "want ads", advertisements to sell livestock, dairy products, fruit, berries, truck, food products; how to write the business letters of the farmer; the preparation of booklets, posters, sales bills, and other mediums. Lectures and assignments for practice. Mr. Sumner.

8. WRITING HOME ECONOMICS NEWS. I; 3 cr. A course in the fundamentals of writing home economics material. Designed to aid teachers and extension workers in publicity and to give training to students who plan to make a profession of journalism. Mr. Sumner.

100. THESIS. Yr; 2 cr. Original studies of a journalistic or advertising nature. Practical problems are investigated. Mr. Hopkins, Mr. Sumner.

103. AGRICULTURAL PUBLICITY METHODS. II; 2 cr. Outlining and finding effective methods of publicity. This course takes up the publicity campaign, the different mediums as to their advantage and uses, publicity copy, exhibits, and charts. Prerequisite: Agr. Journ. 1 or 8. Mr. Hopkins.

106. ADVERTISING SURVEY FOR HOME ECONOMICS. II; 2 cr. A general course to present to the home economics student who expects to enter the business world, a background of sales and advertising methods and practices. Mr. Sumner.

111. WRITING FARM AND HOME FEATURES. II; 2 cr. A course to follow the elementary courses in writing farm and home stories. The technique of writing the longer feature stories for the farm papers and women's magazines is given primary consideration. Prerequisite: Agr. Journ. 1 or 8. Mr. Sumner.

150. SEMINARY. I, II; 2 cr. Mr. Hopkins, Mr. Sumner.

200. RESEARCH. I, II; *cr. A practice problem such as confronts the county agent, scientist, publicity man, extension worker, or editor is analyzed and an effort made for a constructive solution. Advertising problems and policies such as confront the breeder or pure-bred seed grower may be studied. Prerequisite: Agr. Journ. 1, 3, or 8. Mr. Hopkins, Mr Sumner.

AGRONOMY

RANSOM ASA MOORE, *Professor of Agronomy, Chairman*
EDMOND JOSEPH DELWICHE, M.S., *Professor of Agronomy*
LAURENCE FREDERICK GRABER, Ph.D., *Professor of Agronomy*
BENJAMIN DONALD LEITH, B.S., *Professor of Agronomy*
GEORGE BYRON MORTIMER, B.S., *Professor of Agronomy*
GEORGE MCSPADDEN BRIGGS, B.S., *Associate Professor of Agronomy*
ALDEN LESCOMBE STONE, *Associate Professor of Agronomy*
ANDREW HAMILTON WRIGHT, M.S., *Associate Professor of Agronomy*
EUGENE DAVENPORT HOLDEN, M.S., *Assistant Professor of Agronomy*
RUEBUSH GEORGE SHANDS, Ph.D., *Assistant Professor of Agronomy*

PRACTICAL MAJOR. Students majoring in agronomy and wishing to prepare for farming, farm managers, county agricultural agents, crop reporting positions, commercial positions in seed trade, or teachers of secondary school agriculture, should elect 10 credits from the following: Physics 61, 5 cr.; Zoology 3, 3 cr.; Geology 1, 5 cr.; Geography 106, 3 cr.; Botany 2, 5 cr.; Chemistry 11, 3 cr.; Mathematics 2, 4 cr.; Mathematics 3, 3 cr.

It is suggested that the courses selected in agronomy be taken in the following order. For the sophomore year, 120, 3 cr.; 102, 2 cr.; for the junior year, 106, 3 cr.; for the senior year, 107, 2 cr.; 121, 3 cr.; 130, 3 cr.; 131, 2 cr.

Practical majors desiring to teach secondary school agriculture should note the regular teacher training requirements given under Agricultural Education.

SCIENTIFIC MAJOR. Student desiring to prepare as professional agronomists such as plant breeders, either institutional or commercial research and extension specialists, teachers, or seed analysts should take a more specialized major emphasizing scientific subjects. In the sophomore year Chemistry 11, 3 cr., and Zoology 3, 3 cr., should be taken together with an additional 4 cr. in either science or mathematics. Soils 1, 5 cr. and Agricultural Chemistry 1 and 2, 5 cr., are suggested. In the junior or senior year, Chemistry 20 and 21, 4 cr., Genetics 101, 3 cr., Botany 117, 3 cr., Soils 127, 2 cr., and Plant Pathology 101, 3 cr.

Departmental requirement should be followed as suggested under the practical major with the addition of Agronomy 205, 2 cr., in the senior year. If graduate work is intended a foreign language should be added beginning with the junior year. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in Agronomy: Soils 120, Soil management; Soils 127, Soil science and plant nutrition; Plant Pathology 101, Diseases of plants; Plant Pathology 116, Diseases of field crops; Botany 117, Structure of economic plants; and Botany 129, Classification of cultivated plants.

1. GENERAL FARM CROPS. I, II; 3 cr. Includes a study of farm crop seeds, crop varieties and types, botanical relations, adaptations, cultural practices, judging, crop improvement and studies of individual crops. Required of all agricultural students. Lab. fee $4.50. Mr. Mortimer.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Staff.

101. SPECIAL CROP PROBLEMS. Yr; *cr. Offered at Madison and the branch experiment stations. Lab. fee $2.25 per lab. cr. Staff.

102. Pastures and Pasture Problems. I; 2 cr. Pasture studies based on kinds; best methods of establishing, maintaining and improving them; and the crops best suited to this use. Prerequisite: Agronomy 1. Mr. Mortimer.

106. Forage Crops. II; 3 cr. Growing and handling forage crops, with emphasis on recent developments in relation to livestock farming. Prerequisite: Agronomy 1. Mr. Moore, Mr. Graber.

107. Forage Problems. II; 2 cr. Physiological, anatomical, and morphological aspects of forage plants in relation to field practices, with emphasis on food reserves, winter injury, and other agronomic problems. For seniors and graduate students. Lab. fee $4.50. Mr. Graber.

120. Seed and Weed Control. I; 3 cr. A study of the economic relations of farm seeds and weeds to profitable agriculture. Prerequisite: Agronomy 1. Lab. fee $4.50. Mr. Stone.

121. Grain Production and Crop Judging. I; 3 cr. Varieties, uses, distribution, and approved practices in growing, together with judging competitive farm crop displays. Prerequisite: Agronomy 1. Lab. fee $4.50. Mr. Mortimer, Mr. Holden.

130. Plant Breeding. II; 3 cr. Methods and principles involved in the improvement of crops. Prerequisites: Agronomy 1 and Botany 1. Mr. Leith.

131. Seminary. Yr; 1 cr. A review of current literature and studies of agronomic problems. For seniors and graduate students. Prerequisites: Agronomy 1 and Botany 1. Staff.

200. Research. Yr; *cr. Agronomic problems for students qualifying for advanced degrees. Given in connection with thesis or graduate study. Lab. fee $2.25 per lab. cr. Staff.

205. Crop Environment. II; 2 cr. Reports and discussions on the findings in fields related to crop plants, and their interrelations. Mr. Wright.

ANIMAL HUSBANDRY

George Colvin Humphrey, B.S., *Professor of Animal Husbandry, Chairman*
Gustav Bohstedt, Ph.D., *Professor of Animal Husbandry*
James Garfield Fuller, M.S., *Professor of Animal Husbandry*
Arlie Max Mucks, B.S., *Associate Professor of Animal Husbandry*
John Merrill Fargo, M.S., *Assistant Professor of Animal Husbandry*
James Jerome Lacey, B.S., *Assistant Professor of Animal Husbandry*
Isaac Walker Rupel, M.S., *Assistant Professor of Animal Husbandry*
Arthur Owen Collentine, *Instructor in Animal Husbandry*
Albert Julius Cramer, B.S., *Instructor in Animal Husbandry*
Roy Theodore Harris, *Instructor in Animal Husbandry*
Benjamin Hamilton Roche, M.S., *Instructor in Animal Husbandry*

Two majors are offered students in animal husbandry. The practical major is intended primarily for students who intend to return to the farm as farm managers or herdsmen, or who intend to qualify as vocational agricultural teachers or county agricultural agents. Students taking this major should

elect Agricultural Chemistry 1 and 2 and Physiology 3, Animal physiology, in their sophomore year. In the junior and senior years they should elect animal husbandry courses in feeding, judging, breeding and production. Students who wish to qualify for a teacher's certificate should elect teachers' courses not later than the beginning of the junior year. Agricultural Journalism 3, Advertising; Agricultural Economics 10, Farm Organization and Management; Dairy Husbandry 5, City milk supply; and Agricultural Bacteriology 121, Dairy bacteriology; and practical courses in other departments are suggested.

The animal science major is planned for men desiring to go into college or experiment station work and is suggested for those intending to do extension work. For training in this field students should elect Veterinary Science 1 and Dairy Husbandry 1 in the sophomore year. Organic chemistry should be taken in the junior year in addition to courses suggested in the practical major. In the senior year desirable electives, in addition to some production courses, are Agricultural Chemistry 121, Dairy chemistry; Agricultural Chemistry 122, Animal chemistry; and Genetics 101 and 102. Not to exceed five credits from the following courses may be counted as a portion of the major requirements in animal husbandry: Agricultural Chemistry 121 and 122, Genetics 101 and 102, Veterinary Science 2 and 3.

1. LIVESTOCK PRODUCTION. I, II; 3 cr. Livestock survey, breed history, judging, market classification; practical problems, lectures, and laboratory exercises. Required of all agricultural students. Lab. fee $4.50. Mr. Fuller.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Humphrey and staff.

124. ANIMAL BREEDING. II; 2 cr. The principles and approved methods relating to the breeding of livestock. Prerequisite: An. Husb. 1. Mr. Fargo.

126. LIVESTOCK FEEDING. I; 4 cr. A study of the principles of feeding and the composition of feeds; practice in formulating rations for the various classes of livestock; evaluation of feeds and feeding practices from a study of experiments and customs. Prerequisite: An. Husb. 1. Mr. Bohstedt, Mr. Rupel.

129. SHEEP PRODUCTION. II; 2 cr. A study of breed history and judging; farm flock management for production of market and pure-bred sheep, including wool-grading and judging; fattening western lambs for market. Prerequisite: An. Husb. 1. Lab. fee $2.25.

130. SWINE PRODUCTION. I; 3 cr. Judging of breeding and market hogs; history of the hog industry in America; systems and costs of production and marketing; the hog carcass and consumption of pork products; and the breeding, feeding, and management of breeding and market hogs. Prerequisites: An. Husb. 1 and 126. Lab. fee $2.25. Mr. Fargo.

131. HORSE PRODUCTION. I; 2 or 3 cr. Pedigree work, conformation study, judging, production problems, and fundamentals in breaking and hitching. Prerequisite: An. Husb. 1. Lab. fee $2.25. Mr. Fuller.

132. BEEF CATTLE PRODUCTION. II; 2 cr. Pedigree work, judging, feeding, and marketing beef cattle; production problems. Prerequisite: An. Husb. 1. Lab. fee $2.25. Mr. Fuller.

133. Dairy Cattle and Milk Production. II; 3 cr. Selection of animals for milk production and for breeding purposes. Present day types and breed characteristics. Herd management, advanced registry testing, calf raising, selling of surplus breeding stock. Control measures relating to quality in commercial and special grades of milk. A two-day tour to visit leading pure-bred herds, dairy equipment plants, and farms producing certified milk is required; the cost is from $10.00 to $15.00. Prerequisite: An. Husb. 1. Lab. fee $4.50. Mr. Rupel.

134. Special Problems. Yr; *cr. Special problems on feeding, management, breeding, or judging of livestock, including laboratory, library, or field work with conferences and reports. These problems will be assigned by respective members of the staff. Consent of instructor required. Lab. fee $2.25 per lab. cr. Mr. Fuller and staff.

135. Animal Husbandry Seminary. Yr; 1 cr. Studies and discussions of research work in animal husbandry and related fields; reports on articles of interest. For advanced and graduate students. Mr. Bohstedt.

200. Research. Yr; *cr. A detailed study of a definite research problem in animal husbandry. Conference on experimental methods. Lab. fee $2.25 per lab. cr. Mr. Bohstedt and staff.

DAIRY HUSBANDRY

Howard Campbell Jackson, Ph.D., *Professor of Dairy Husbandry, Chairman*
Edward Holyoke Farrington, M.S., *Professor of Dairy Husbandry, Emeritus*
Walter Van Price, Ph.D., *Professor of Dairy Husbandry*
Hugo Henry Sommer, Ph.D., *Professor of Dairy Husbandry*
John Langley Sammis, Ph.D., *Associate Professor of Dairy Husbandry*
Louis Charles Thomsen, B.S., *Assistant Professor of Dairy Husbandry*
Charles Alfred Buck, B.S., *Instructor in Dairy Husbandry*
Hans Tjellesen Sondergaard, *Instructor in Dairy Husbandry*

The department offers instruction in the science and art of manufacturing dairy products, suited to the needs of (a) farm dairymen, (b) investigators or teachers, (c) managers, operators, or inspectors of creameries, cheese factories, city milk, ice cream plants, and condenseries.

Students majoring in dairy manufacturing should elect Physics 61, 5 cr., Chemistry 120-121, 5 cr., Agricultural Chemistry 1 and 2, 5 cr., and Dairy Husbandry 1, 3 cr., in the sophomore year. Agr. Chem. 121, Dairy chemistry, 5 cr., and Agr. Bact. 121, Dairy bacteriology, 3 cr., should be taken in the junior year; and Dairy Husbandry 3, 5, and 8, 3 cr. each, Dairy Husbandry 4, 4 cr. and Dairy Husbandry 123, 2 cr. should be taken in the senior year as a minimum.

Dairy Husbandry is intimately connected with the Departments of Animal Husbandry, Agricultural Bacteriology, and Agricultural Chemistry, and with marketing given in the Department of Agricultural Economics. Students preparing for dairy manufacturing should consider courses in these departments when selecting electives related to the major.

1 Introduction to Dairying. II; 3 cr. A general survey course designed to give the student an understanding of the relationship of dairy manufacturing to general farm problems. Emphasis is given to methods of quality control, judging, and elementary analysis of dairy products. Lab. fee $4.50. Mr. Jackson, Mr. Thomsen.

3. Creamery Operation and Management. I; 3 cr. The theory and practice of cream separation, the pasteurization and handling of dairy products under commercial conditions, composition and flavor control of butter, and the management and operation of creameries. Lab. fee $4.50. Mr. Jackson, Mr. Thomsen.

4. Cheese Factory Operation and Management. I; 4 cr. A combined lecture and laboratory course to study the manufacture of cheese. Several types of cheese are made by the students in the laboratory to acquaint them with commercial practices and to illustrate the importance of certain physical, chemical, and biological factors which influence curd-making and cheese-ripening. Lab. fee $4.50. Mr. Price.

5. City Milk Supply and Ice Cream Making. I; 3 cr. The commercial handling of market milk and preparations. Milk ordinances and board of health regulation of milk supplies. Theory and practice of ice cream making. Lab. fee $4.50. Mr. Sommer.

8. Dairy Mechanics. II; 3 cr. Dairy plant construction, heating, ventilation; sewage disposal; refrigeration; installation, testing, and operation of dairy machinery. Lab. fee $2.25. Mr. Thomsen.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Staff.

102. Dairy Practice. Yr; 1-4 cr. One credit for each 48 hours of work. Lab. fee $2.25 per lab. cr. Mr. Jackson.

121. Advanced Dairy Manfacturing Problems. Yr; 1-3 cr. Problems relating to dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.

123. Seminary. Yr; 1 cr. For advanced and graduate students. Mr. Sommer and staff.

124. Physical Chemistry of Dairy Products. II; 3 cr. Physical chemistry of dairy products, laboratory exercises on hydrogen ion concentration, oxidation-reduction potentials, surface tension, absorption, viscosity and plasticity, isoelectric point of proteins, colloidal properties of milk constituents. Offered 1933-34 and in alternate years. Lab. fee $4.50. Mr. Sommer.

200. Research. Yr; *cr. Experimental study of problems in dairy manufacturing. Lab. fee $2.25 per lab. cr. Staff.

ECONOMIC ENTOMOLOGY

Harley Frost Wilson, M.S., *Professor of Economic Entomology, Chairman*
Charles Lewis Fluke, Jr., Ph.D., *Associate Professor of Economic Entomology*
Edward M. Searls, M.S., *Assistant Professor of Economic Entomology*
Erwin Charles Alfonsus, M.S., *Instructor in Economic Entomology*

Students majoring in economic entomology and desiring to be trained in entomological or beekeeping research for the positions offered by the state agricultural experiment stations and the government service, should follow the curriculum as outlined. Those preparing for entomological chemical work, especially with insecticides, should elect more work in chemistry and physics. Students pursuing specialized lines, such as biological control of insects, insect physiology, and insects in relation to plant diseases, should elect more work in plant pathology, botany, and physiology.

Those interested in the opportunities for graduate work in entomology and beekeeping should write to the Department of Economic Entomology for a special circular of information.

1. Farm Insects. II; 3 cr. A study of the insect groups, especially those in relation to the farm and home. Each student makes a collection of at least one hundred specimens, which he classifies. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Fluke.

2. Elementary Economic Entomology. I; 3 cr. The fundamental principles of entomology are stressed, giving the student a foundation in the subject which prepares him for advanced studies of insects. Lab. fee $4.50. Mr. Fluke.

10. Elementary Beekeeping. I; 2 cr. Elementary principles of beekeeping with lectures and practical laboratory work. A general survey of the subject is taken up, with the fall and winter care in the apiary being stressed. Lab. fee $2.25. Mr. Alfonsus.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Wilson and staff.

103. Orchard Insects. II; 2 cr. A laboratory study of the life histories and controls of the principal insect pests of the orchard and bush fruits. Prerequisite: Economic Entomology 1 or 2, or Zoology 3. Offered 1933-34 and in alternate years. Lab. fee $2.25. Mr. Fluke.

105. Field Crop and Garden Insects. II; 2 cr. A laboratory study of the principal insect pests of field, garden, and truck crops; their life histories and controls. Prerequisite: Economic Entomology 1 or 2, or Zoology 3. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Searls.

110. Commercial Honey Production. II; 2 cr. Lectures and laboratory periods dealing with the yearly management of the apiary for intensified honey production, building up in the spring, swarm control, supering for the honey flow, and care of bees in the fall and winter. Prerequisite: Economic Entomology 10. Lab. fee $4.50. Mr. Alfonsus.

120. Taxonomy and Topical Work. I, II; *cr. (a) Biological relations of insects; physiology of insects. (b) Methods in entomology and insect photography. (c) Taxonomy of adult insects. Prerequisite: Economic Entomology 1 or 2. Lab. fee $2.25 per lab. cr. Mr. Wilson, Mr. Fluke, Mr. Searls.

123. Taxonomy of Insect Larvae. I; 3 cr. A study in the identification and morphology of immature insects. Lecture and laboratory. Prerequisites: Economic Entomology 2 and 120 or consent of instructor. Searls.

125. Insects in Relation to Plant Diseases. I; 2 cr. A study of the principal insect carriers and their habits; types of insect injuries affect- plant diseases; and the methods of rearing and handling the carriers. Arranged to meet the needs of students in entomology, plant pathology, horticulture, and agronomy. Prerequisite: A course in entomology and plant pathology or consent of instructor. Lab. fee $2.25. Mr. ing health of plants; modes of insect transmission and dissemination of Lab. fee $4.50. Mr. Searls.

130. SEMINARY. I, II; 1 cr. For advanced and graduate students. Mr. Wilson.

200. RESEARCH. Yr; *cr. Lab. fee $2.25 per lab. cr. Mr. Wilson and staff.

FORESTRY

(See Forest Products Laboratory, page 440.)

GENETICS

LEON JACOB COLE, Ph.D., *Professor of Genetics, Chairman*
ROYAL ALEXANDER BRINK, D.Sc., *Professor of Genetics*
MALCOLM ROBERT IRWIN, Ph.D., *Assistant Professor of Agricultural Bacteriology and Genetics*
AGNES ZEIMET, Ph.D., *Instructor in Genetics*
DELMER CLAIRE COOPER, Ph.D., *Research Associate in Genetics*

The following courses are designed for those who desire a general knowledge of the subjects of heredity and breeding, or who contemplate following these lines, either from the theoretical or practical point of view. Special opportunity is offered those doing advanced work to get practical experience in the methods of experimental breeding.

100. THESIS. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

101. PRINCIPLES OF BREEDING. I; 3 cr. Elementary principles of heredity in their application to plant and animal breeding. Additional prescribed reading and written reports for graduate credit. Prerequisite: A course in biology. Mr. Cole.

102. ELEMENTARY LABORATORY. I; 1-2 cr. Breeding experiments illustrating the principles of heredity. Prerequisite: Genetics 101 or concurrent registration. Lab. fee $2.25 per lab. cr. Mr. Brink and staff.

104. PLANT GENETICS. I; 3 cr. Variation and inheritance in plants, including genetics of sterility and disease resistance, and principles of plant improvement. Prerequisite: Genetics 101 or equivalent in zoology or botany. Mr. Brink.

105. ANIMAL GENETICS. II; 2 cr. Inheritance of economic characters in domesticated animals; study of animal breeding methods; evaluation and analysis of pedigrees; application of genetics to the problems of livestock production. Prerequisite: Same as for Genetics 104. Mr. Cole.

106. BIOMETRIC METHODS. II; 2 cr. Lectures and laboratory work in calculation of statistical measures of variability and correlation and their practical application. Determination and usage of probable errors of such measures and for Mendelian data. Prerequisite: Same as for Genetics 104. Lab. fee $2.25. Mr. Brink.

120. SEMINARY. Yr; 1 cr. Consent of instructor required before election. Mr. Cole.

121. Topical Work. Yr; *cr. Either (a) assigned topics in laboratory or field work with reading, conference, and report, or (b) practice work including practical experience in the various lines of research carried on in the department; problems, technique, and methods of record keeping. For those not prepared to elect Course 200. May be taken in connection with, or subsequent to, Genetics 101; consent of instructor required. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

200. Research. Yr; *cr. For students qualified by preliminary training. Work may be based on the analysis of available data, or upon new data acquired by experiment. The summer season offers exceptional opportunity for breeding work with both animals and plants. Opportunity is offered to a limited number of properly qualified students for research under direction during the summer. Such work may extend through the whole season and is applicable toward advanced degrees. Lab. fee $2.25 per lab. cr. Mr. Cole, Mr. Brink.

HOME ECONOMICS

CLOTHING AND TEXTILES

Hazel Manning, M.S., *Professor of Home Economics, Chairman*
Marion Abbie Juaire, M.S., *Assistant Professor of Home Economics*
Cecelia Frances Abry, M.S., *Instructor in Home Economics*
Mrs. Julia Frank Nofsker, M.S., *Instructor in Home Economics*

5. Textile Sthdy: Commecial Fibres and Their Use. I, II; 2 or 3 cr. Historical background, production, and manufacture of commercial fibres. Technique in use, construction, and study of cotton garments, with special reference to comparative expenditure and wise choice of fibrics. Lecture and two laboratory periods. The third credit, elementary textile chemistry, given first semester only. Lab. fee. $2.25 per cr. Mrs. Nofsker, Miss Juaire, Miss Abry.

10. Clothing Economics. I; 2 cr. Lecture and required reading covering economic and sociological phases of the development of the ready-to-wear clothing industry in the United States. Economic study of distribution through department, chain, specialty, and mail-order houses. The psychology of advertising methods used in salesmanship. Study of family clothing budgets. Open to election by juniors and seniors in any colege. Miss Manning, Miss Abry.

11. Problems in Applied Dress Design. II; 3 cr. Application of art principles and economic laws to the selection of commercial costumes suitable for the individual. Planning and blocking a dress (remodeling problem) using renovated textile materials. Adaptation of patterns and development of a foundation pattern; constructing a tailored suit or coat in wool; designing and making a gown in silk emphasizing fundamental principles of good standards of technique. Two hours for discussion, 4 hours lab. Prerequisites: Home Economics 2, 5, 50. Lab. fee $4.50. Miss Juaire.

32. Children's Clothing. II; 2 cr. Studies in choice, selection, design, hygiene, and economics of ready-to-wear versus homemade clothing for children. Case studies of shop practices; budget standards in the home. Prerequisites: Home Economics 5 and junior standing. Lab. fee $2.50. Mrs. Nofsker.

50. Textile Chemistry. I, II; 3 cr. Microscopical and chemical study of the fibres, bleaching, scouring, dying, and chemical examination of fabrics; tests for adulteration of materials. Prerequisite: Chem. 1a and 1b. Lab. fee $6.00. Miss Abry.

53. Seminary in Clothing Methods. I, II; 2 cr. Planning equipment, supplies, and exhibits for high-school courses. Construction of illustrative material planned for courses of study in secondary schools. Selection of suitable material, patterns, and methods for high-school instruction. Reports and demonstrations. Required of all students who are preparing to teach clothing. Prerequisites: Home Economics 2, 5, 10, 11, 20, 50. Lab. fee $4.50. Miss Manning and staff.

80. Topical Work. Yr; *cr. Lab. fee $2.25 per lab cr. Staff.

96. Decorative Details in Household Textiles. I; 2 cr. Arts and techniques used in textiles and clothing construction. Lectures and laboratory work. Open to juniors and seniors in any college. Lab. fee $4.50.

97. Advanced Problems in Applied Dress Design and Costume Selection. I; 2 cr. Study in selection and use of design in modeling and draping outer garments in wool and silk. Independent work, students required to complete problems outside. Study of different materials as adapted to costume studied. Selection of ready-to-wear clothing and accessories with emphasis on appropriate use and value. One hour for discussion and topics; 3 hours lab. Required of textile majors. Open to seniors. Prerequisite: Home Economics 11. Lab. fee $4.50. Miss Juaire.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Miss Manning and staff.

103. Economic History of Textile Industry. II; 2 cr. A survey of the development of the textile industry from medieval industrial organization to present day problems of factory and sweat-shop. Miss Manning.

104. History of Costume in its Sociological Aspects. I; 2 cr. History of costume in classical antiquity and its subsequent development, with its periodic recurrence in design and its relation to the leisure class and to the cost of living. Open to seniors and graduates. Miss Manning.

106. Seminary in History of American Costume. II; 2 cr. From the revolution to the present day. Relation of the costume to the social and economic history and growth of the United States. European influence upon materials, processes, dyes, and technique of manufacture of textiles used in relation to women's clothing. Prerequisite: Senior standing. Miss Manning.

200. Research in Textile Chemistry. I, II; *cr. Lab. fee $2.25 per lab. cr. Miss Manning.

202. Graduate Seminary in Textiles. I, II; *cr. Miss Manning.

FOODS AND ADMINISTRATION

ABBY LILLIAN MARLATT, M.S., Sc.D., *Professor of Home Economics, Chairman*
HELEN TRACY PARSONS, Ph.D., *Associate Professor of Home Economics*
MARY LOUISE COWLES, Ph.D., *Assistant Professor of Home Economics*
RUTH ADELE HENDERSON, M.A., *Assistant Professor in the Teaching of Home Economics*
STELLA TROUT PATTON, M.S., *Assistant Professor of Home Economics*
MRS. MAY STATLER REYNOLDS, M.S., *Assistant Professor of Home Economics*
MRS. DOROTHY REED MENDENHALL, B.A., M.D., *Lecturer in Home Economics*
GEORGIA COLE DURDEN, B.E., *Instructor in Home Economics*
DOROTHY LILLIAN HUSSEMANN, M.S., *Instructor in Home Economics*
KATHERINE JONES, M.A., *Instructor in the Teaching of Home Economics*
FRANCES ELIZABETH ROBERTS, B.S., *Instructor in Home Economics*
MRS. DOROTHEA TURNER, M.S., *Instructor in Home Economics*

1a. GENERAL SURVEY, ELEMENTARY DIETETICS. I; 2-4 cr. Detailed study of standards in diet for all ages; diet for the sick. Laboratory practice in the study of the more common foods and their preparation and service in meals for the family group. Special problems in planning low-cost meals in preparation for social welfare casework. Open to juniors and seniors. Lab. fee $2.25 per lab. cr. Mrs. Reynolds, Miss Roberts.

3. INTRODUCTION TO FOOD STUDY. II; 3 cr. Study of the principles used in the selection and preparation of food and meal service. Prerequisite: High-school physics and chemistry, Chemistry 1a, or Biology 1. Lab. fee $4.50. Miss Marlett and staff.

4. PROBLEMS OF FOOD SUPPLY. I; 3 cr. Effect of manufacture upon cost and quality of food; methods and apparatus used in preparation and preservation of foods; study of pure food laws; weights and measures; comparative cost studies of fuels and refrigeration; labor costs in relation to food prices. Prerequisites: Agr. Chem. 3, bacteriology, physics, Home Econ. 3. Lab. fee $4.50. Miss Patton.

6. NUTRITION AND DIETETICS. II; 2 cr. Dietary standards, balanced rations, dietary needs as modified by age, sex, occupation. Newer knowledge of body building, growth factors, relation of nutrition to physical development. How to plan meals so that family needs are met biologically and economically. Prerequistes: Home Econ. 3 and 4, Physiology 1, Agr. Chem. 3. Mrs. Reynolds, Miss Hussemann.

9. INTRODUCTION TO HOME ECONOMICS. I; 1 cr. The history of the home, social customs, and their value in the evolution of the family. Staff.

16. DIETETICS LABORATORY. II; 2 cr. Includes study of chemical and physical properties of foods, planning, preparation, and selection of foods, service of meals to meet body needs of individuals and family groups. Study of basal metabolism, a diet study upon self, and detailed dietary study of a group at the practice cottage. Nursery school dietaries planned and the pre-school child's eating habits studied. Nutrition demonstration with animals. Prerequisites: Same as for Home Econ. 6. Lab. fee $4.50. Mrs. Rynolds, Miss Hussemann, Miss Roberts.

47. Diet Problems in Feeding Children. I; 3 cr. Food requirements of young children; actual practice in preparing meals and studying the diet habits of children in the Dorothy Roberts Nursery School; studies in establishment of correct feeding habits in children. Lecture, conference, and laboratory. Lab. fee $2.25. Miss Roberts.

80. Topical Work. Yr; *cr. Lab. fee $2.25 per lab. cr. Miss Marlatt and staff.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Miss Marlatt and staff.

105. Experimental Food Study. I, II; 2 cr. A laboratory course in quantitative experimental work in the field of cookery. An introduction to research work in foods and nutrition. Lab. fee $4.50. Miss Marlatt.

125. Dietotherapy. I, II; 3 cr. The adaptation of diet to the disorders of nutrition. Prerequisites: Home Econ. 6 and 16. Lab. fee $2.25 per lab. cr. Miss Parsons, Mrs. Turner.

127. Problems in Human Nutrition. I, II; *cr. Miss Parsons.

200. Research in Foods and Nutrition. I, II; *cr. Lab. fee $2.25 per lab. cr. Miss Marlatt, Miss Parsons.

202. Topical Work in Foods and Nutrition. I, II; *cr. Miss Marlatt, Miss Parsons.

HOUSING AND HOUSE MANAGEMENT

1b. General Survey, Household Management. II; 2-3 cr. Lectures, 2 cr; conference, 1 cr. Nature of the family income, problems related to its source and distribution; the family budget, the standard of living, changes in family expenditure under different conditions; the cost of living, special problems encountered in selection and purchase of food, housing, clothing, and other commodities for the household. Especially planned for social welfare workers. Reference work is required. Conference includes practice in planning a budget for a specific family, with opportunity for social welfare workers to discuss special problems in planning minimum budgets; discussion of selection and purchase of clothing. Open to juniors and seniors in any college. Miss Cowles and staff.

7. House Architecture and Sanitation. I; 2 cr. Historic and present day architectural styles illustrated by slides and field trips. Study of problems involved in building the present day house, including choice of site, details of house construction, plumbing, heating, ventilation lighting, sanitation. Discussion of house arrangements which save labor and time in house management. Prerequisite: Home Econ. 2. Miss Marlatt, Miss Mason.

17. House Architecture Laboratory. I; 2 cr. Practice in reading blue prints; planning and drawing floor plans and exteriors of one- and two-story houses suited to needs of special project. Working drawings of labor-saving details and built-in furniture. Prerequisite: Home Econ. 7 or concurrent registration. Lab. fee $4.50. Miss Cowles, Miss Roberts, Miss Mason.

72. HOME NURSING. I; 1 cr. A two-hour laboratory course in first aid and home nursing. Open to juniors and seniors in any college. Miss Baumgartner.

80. TOPICAL WORK. Yr; *cr. Lab. fee $2.25 per lab. cr. Staff.

100. THESIS. Yr; 2 cr. On the advice of the major professor Home Economics 80 may be substituted. Lab. fee $2.25 per lab. cr. Miss Marlatt and staff.

109. HUMANICS. II; 1-4 cr. Studies in family relationships and child training. Prenatal and natal care of mother and child; study of beliefs and customs affecting human environment today; value of the family as a basis for advancement; the influence of inheritance and environment of the child in the home; problems of the first year in human life; effect of community standards on family problems; value of home training in education of the child; place of the nursery school in the education of parents and the child; growth of the pre-school child; play of the pre-school child; home problems in adolescence; attitudes toward realities affected by family relationships; influence of the home on developing abnormal mental states; discussion of the home as the best place to rear children. Observation in hospitals and in the Dorothy Roberts Nursery School. Lectures, conference and discussion periods. Open to seniors and graduate students. Miss Marlatt, Mrs. Mendenhall, Miss Durden, Miss Roberts.

110. HOUSEHOLD ADMINISTRATION. I; 2 cr. A study of the social and economic functions of the home, their historic and present status, with special attention given to standards of living, the management of the family income, household organization, and management. Miss Cowles.

112. PROJECTS IN HOUSEHOLD ADMINISTRATION. I; 2 cr. Discussion, conferences, and reports to give students familiarity with the economic problems of the home. The buying problem which the purchaser for the family confronts. Problems arising from the change in character of household production. Study of fluctuations in prices of goods bought by the consumer. Study of problems connected with family income, its amount and source. Students live in the home economics cottage for laboratory practice in solution of problems. Prerequisite: Senior standing in a home economics major. Lab. fee $4.50. Miss Cowles, Mrs. Reynolds.

120. PROBLEMS OF CONSUMPTION. II; 2 cr. The character of the consumer as spender of the family income. Examination of studies of family expenditures to gain knowledge of present day tendencies in consumption. The origin of standards for choice, the character of the goods available as it influences the choice of the buyer of the family's goods. Discussions and conferences. Content of course will be adapted to the needs of students. Miss Cowles.

202. TOPICAL WORK IN CHILD WELFARE. I, II; *cr. Studies on children in the Dorothy Roberts Nursery School. Independent studies on young children. Miss Marlatt, Miss Roberts, Miss Durden.

223. Seminary in Housing Problems. II; 2-3 cr. A study of housing situation in the United States at the present time; the origin of the housing problem in the change in industrial conditions and the shift in the population from country to city; the relation of utilization of land, of transportation, and of distribution of wealth to the housing problem; evolution of the remedies for housing diffculties suggested or used in the United States or Europe, including provision of housing by the government, by employers, legislation of various types, and other remedies. Miss Cowles.

INSTITUTIONAL MANAGEMENT

22. Marketing and Large Quantity Cookery. I; 2 cr. Time study, economic study, and marketing study in the selection, purchase, and preparation of foods in large quantities. Lab. fee $2.25. Miss Mullen.

122. Organization and Administration of Institutions. II; 2 cr. Organization and administration, methods of accounting in office and storeroom, taking of inventories, planning of work for employees. Miss Patton.

133. Tea Room and Cafeteria Management. II; 3 cr. A study of the organization of tea rooms and cafeterias, necessary equipment, service problems, menu making and catering, accounting and advertising. Practice in lunch room management in departmental laboratories. A field inspection trip is required. Lab. fee $2.25. Miss Patton and staff.

134. Institutional Equipment and Furnishing. I; 2 cr. A study of institutional planning and building; the selection, cost, and care of labor saving equipment and other furnishings for hospital, dormitory, or tea room. Prerequisites: Food major, senior standing. Miss Patton and staff.

202. Topical Work in Institutional Management. I, II; *cr. Miss Patton.

222. Laboratory and Research Work. I, II; 2-4 cr. Detailed study of accounting and organization and labor problems as an interne in the University Commons. Lab. fee per lab. cr. Miss Patton.

TEACHER TRAINING

52. Teaching of Home Economics. I, II; 4 cr. Study of problems of the home economics teacher, including lesson plans, courses of study, equipment, reference and illustrative material. Observation and practice work in presentation is afforded. Open also to seniors in School of Education. Lab. fee $2.25 per lab. cr. Miss Henderson, Miss Jones.

53. Clothing Methods. I, II; 2 cr. Selection of illustrative material for clothing courses in secondary schools. Study of suitable material and patterns for high school instruction. Reports and demonstrations. Required of all students who are preparing to teach clothing. Prerequisites: Home Econ. 2, 5, 11, 50, or consent of instructor. Lab. fee $4.50. Miss Manning and staff.

126. Extension Course in Home Economics. I; 2 cr. A course to train extension workers for community leadership and to prepare them to cooperate with all agencies for community development. The course consists of discussions of problems in community orgnizations for health projects, child welfare work, community enterprises, such as co-operative buying, food centers, thrift work, laundries, and hot school lunches; the planning of projects to develop community leaders; and the consideration of principles of economics, psychology, and sociology as applied to the problems of rural life and extension work. Other than professional majors must obtain consent of instructor. Miss Marlatt and staff.

158. Advanced Course in Home Economics Education. I, II; 2 cr. Educational problems. For selected seniors and graduate students who are prepared to do intensive study in special educational methods and tests applied to high-school classes in home making. Miss Henderson.

194. Problems in Teaching Related Art. II; 2 cr. Studies and class discussions. Open to graduate students and for those who have had teaching experience. Mrs. Randolph.

202. Topical Work in Home Economics Education. Yr; *cr. Miss Henderson.

290. Supervision of Home Economics. I; 2 cr. The course is designed to meet the needs of those who desire to become trainers of teachers in home economics. It includes detailed study of the educational literature; place of home economics in the school system; study of administrative problems; the psychological methods used in measuring quality of instruction. Miss Henderson.

RELATED ART

Mrs. Ruth Sackett Randolph, B.S., *Assistant Professor of Home Economics, Chairman*
Elizabeth Barbara Johnson, B.S., *Assistant Professor of Home Economics*
Helen Louise Allen, M.A., *Instructor in Home Economics*

The Department of Related Art aims to promote interest in art as it relates to costume and to the home. It offers to teaching majors in home economics, to majors in art education, and to students interested in commercial work, an opportunity to study design in interiors, costumes, textiles, furniture, and decorative details.

2. Art and Design. I, II; 3 cr. A study of principles underlying line, mass, and color arrangement in art related to the home and to costume. Lab. fee $4.50. Mrs. Randolph and staff.

8. House Decoration. I, II; 2 cr. Problems involved in the decoration and furnishing of the present day home; relation of the decorative scheme to the architectural features; effects of various line, mass and color arrangements; background treatments; methods of lighting; choice of floor covering, draperies, furniture, pictures, and accessories. Illustrated lectures and discussion. Prerequisites: An elementary course in design and junior standing. Miss Johnson.

12. Color. II; 2 cr. A continuation of the study of color in Home Economics 2. Emphasis placed on developing a color sense and a vocabulary of colors. Proctce given in planning many types of color schemes in relation to costume design and interior decoration. Prerequisite: An elementary course in design. Lab. fee $4.50. Miss Allen.

18. House Decoration Laboratory. I, II; 2 cr. A study of problems in planning the decoration of a selected home. Prerequisites: An elementary course in design and junior standing. Should be taken with Home Economics 8. Lab. fee $4.50. Miss Johnson.

20. Costume Appreciation and Selection. I, II; 2 cr. A course in fundamentals of design and style in dress and accessories as a basis for the selection or design of becoming and appropriate clothes. A study of figure, color and personality types, and the relation of carriage and coiffure to personal appearance. Lectures, demonstrations and laboratory work. Prerequisites: An elementary course in design and sophomore standing. Lab. fee $4.50. Mrs. Randolph.

80. Topical Work. Yr; *cr. Lab. fee $2.25 per lab. cr. Mrs. Randolph, Miss Allen.

93. Stage Costuming. II; 2 cr. Practice in designing modern, imaginative and historic costumes for the stage. Sketching and the fundamentals of modeling in materials on the figure. Emphasis on style, color and originality. Planned for students preparing to become costume designers, consultants and play directors. Prerequisites: Home Economics 20. Lab. fee $4.50. Mrs. Randolph.

94. Advanced Applied Design. II; 3 cr. Design and its application to accessories for home and clothing with emphasis on the textile arts. Prerequisites: An elementary course in design and junior standing. Lab. fee $4.50. Mrs. Randolph.

95. Hand Loom Weaving. I, II; 1-3 cr. This course is planned to develop a keener appreciation of the factors involved in textile selection as well as educational application in occupational therapy. It involves the planning of problems in design, color and texture; the preparation of the materials for the loom and the setting up and weaving. Practical problems in both Colonial and Scandinavian weaving are given. The lectures cover the construction of patterns, the reading of patterns from woven materials, and the history of hand weaving. Prerequisites: Home Economics 2 and 5, or consent of instructor. Lab. fee $2.25 per lab. cr. Miss Allen.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mrs. Randolph and staff.

114. Studies and Practice in Interior Decorating and Furnishing. I, II; 2 cr. Prerequisites: Home Economics 8, 18, 94, and 116 or concurrent registration. Miss Johnson.

116. Seminary in Interior Decorating and Furnishing. Yr; 2 cr. Prerequisites: Senior standing and a knowledge of history and historic styles of ornament.

121. Advanced Costume Design. II; 2 cr. Advanced problems in designing modern dress and accessories. Field trips to costume studios and factories. Prerequisites: Senior standing and an elementary course in costume design. Lab. fee $4.50. Mrs. Randolph.

194. Problems in Teaching Related Art. II; 2 cr. Prerequisite: Graduate standing or teaching experience. Mrs. Randolph.

202. Topical Work in Related Art. Yr; *cr. Mrs. Randolph.

HORTICULTURE

James Garfield Moore, M.S., *Professor of Horticulture, Chairman*
James Johnson, Ph.D., *Professor of Horticulture*
James Garfield Milward, M.S., *Professor of Horticulture*
Ray Harland Roberts, Ph.D., *Professor of Horticulture*
Franz August Aust, M.S., M.L.D., *Associate Professor of Horticulture*
John William Brann, M.S., *Assistant Professor of Horticulture and Plant Pathology*
Conrad Louis Kuehner, B.S., *Assistant Professor of Horticulture*
Ismé Aldyth Hoggan, Ph.D., *Instructor in Horticulture*
George William Longenecker, B.S., *Instructor in Horticulture*
Norman Arthur Morris, B.S., *Instructor in Horticulture*
William Butler Ogden, B.S., *Instructor in Horticulture*

The courses offered in horticulture permit the student to specialize in fruit growing, landscape design, or vegetable production. The choice of electives taken in other departments to supplement horticultural courses will be determined by the specialization and the particular phase of the work the student expects to enter. Courses 1, 2, 5, 6, and 7 should be of particular interest to students specializing in other departments who are fitting themselves to be county agents, teachers in vocational or high schools, or farm managers or operators.

Major in general horticulture may count a maximum of five credits toward the major requirement by electing Economic Entomology 1, 103, or 105, and Plant Pathology 5 or 101. Students specilizing in landscape gardening may count toward the major five credits in the above mentioned courses or in the following: Rural Sociology 25, Art Education 52, 62, and Topographic Engineering 108. Such students are also referred to courses in city planning offered by the College of Engineering.

1. Principles of Fruit Growing. I; 3 cr. The principles of fruit growing and their application to our common tree fruits. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Moore.

2. Advanced Fruit Growing. Yr; 2 cr. First semester; the harvesting, storage, and marketing of tree fruits. Second semester; pruning, spraying, and orchard soil management. Prerequisite: Hort. 1 or consent of instructor. Lab. fee $2.25. Mr. Roberts.

3. Vegetable Gardening. II; 3 cr. The growing of vegetables out-of-doors. Practical work in the gardens. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Moore.

5. Small Fruit Culture. I; 2 cr. Culture of cane, bush, and other small fruits. Mr. Moore.

6. LANDSCAPE GARDENING. I; 3 cr. Discussion of the principles of landscape art. Field and laboratory work in the study of decorative plants and the making of planting plans. A trip will be taken to a nursery for the purpose of studying plant materials and nursery practice. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

7. PLANT PROPAGATION. II; 2 cr. Principles and practices involved in propagating horticultural plants. Lectures and laboratory. Lab. fee $2.25. Mr. Moore.

8. FLORICULTURE. II; 3 cr. Propagation and care of house, garden, and lawn plants with reference to home floriculture. Designed for women. Lab. fee $2.25. Mr. Moore.

12. ELEMENTARY HOME GROUNDS DESIGN. II; 3 cr. A continuation of Horticulture 6 dealing specifically with the problems of ground beautification. Prerequisite: Hort. 6. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

13. GRADING AND LAWNS. I; 2 cr. Lawn construction, grading, terracing, estimating, materials, planting lists, and specifications. Prerequisite: Engineering 1. Offered 1932-33 and in alternate years.

14. LANDSCAPE CONSTRUCTION PROBLEMS. I; 2 cr. Construction of walls, steps, ramps, drives, and walks. Prerequisite: Hort. 6. Offered 1933-34 and in alternate years. Lab. fee $4.50. Mr. Longenecker.

15. WATER PROBLEMS. II; 3 cr. Garden pools, water features, and landscape drainage problems. Prerequisite: Hort. 6. Offered 1933-34 and in altrenate years. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

100. THESIS. Yr; 2 or more cr. Research work on horticultural subjects. Fees depend upon character of thesis work. Lab. fee $2.25 per lab. credit. Mr. Aust, Mr. Johnson, Mr. More, Mr. Roberts.

101. ADVANCED HOME GROUNDS DESIGN. I; 3 cr. Design of estate, country home grounds, and related problems. Prerequisites: Hort. 6 and 12. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

102. CIVIC PROBLEMS. II; 3 cr. Landscape problems in connection with public buildings. Park and cemetery design. Roadside planting. Lab. fee $4.50. Mr. Aust, Mr. Longenecker.

104. LANDSCAPE PLANTS. II; 2 cr. Advanced study of animals, herbaceous perennials, shrubs, and trees. Prerequisite: Hort. 6. Offered 1932-33 and in alternate years. Lab. fee $2.25. Mr. Longenecker.

105. PLANT ECOLOGY AND DESIGN. I; 2 cr. A study of plant forms, color, and texture in landscape design. Prerequisite: Hort. 104. Offered 1933-34 and in alternate years. Lab. fee $2.25. Mr. Longenecker.

110. SEMINARY. Yr; 1 cr. For advanced and graduate students. Mr. Aust, Mr. Roberts.

121. HORTICULTURAL PROBLEMS. Yr; 1-3 cr. Assigned problems in the phase of horticulture in which the student is particularly intrested: (a) fruit growing, Mr. Moore, Mr. Roberts; (b) gardening and floriculture, Mr. Moore; (c) landscape, Mr. Aust, Mr. Longenecker. Lab. fee $2.25 per cr.

122. Systematic Pomology. I; 3 cr. Classification, identification, judging, and distribution of our common fruits. Prerequisite: Consent of instructor. Offered 1933-34 and in alternate years. Lab. fee $4.50. Mr. Moore.

126. Rural Improvement. II; 3 cr. Farmstead, community center, regional planning, and their relation to rural conditions. Prerequisite: Economics 1a. Mr. Aust.

LIBRARY

Clarence Scott Hean, B.A., *Librarian*

1. Library Practice. I; 2 cr. The classification and arrangement of books, filing of bulletins, use of card catalogs, periodical indexes, abstract journals, public documents, standard reference works, including handbooks in the various fields of knowledge, and the compiling of bibliographies. Mr. Hean.

PLANT PATHOLOGY

George Wannamaker Keitt, Ph.D., *Professor of Plant Pathology, Chairman*
James Geere Dickson, Ph.D., *Professor of Plant Pathology*
Benjamin Minge Duggar, Ph.D., *Professor of Botany and Plant Pathology*
Edward Martinius Gilbert, Ph.D., *Professor of Botany and Plant Pathology*
Lewis Ralph Jones, Ph.D., Sc.D., *Professor of Plant Pathology*
Albert Joyce Riker, Ph.D., *Professor of Plant Pathology*
Richard English Vaughan, M.S., *Professor of Plant Pathology*
John Charles Walker, Ph.D., *Professor of Plant Pathology*
John William Brann, M.S., *Assistant Professor of Horticulture and Plant Pathology*
John Jefferson Davis, B.S., M.D., *Curator of the Herbarium*
Clarice Audrey Richards, Ph.D., *Lecturer in Forest Products*

Courses 104, 149, 220, 221, and 252 are offered in the Department of Botany, College of Letters and Science.

5. Crop Diseases and Their Control. I; 2 cr. Lectures and demonstrations dealing with the occurrence, symptoms, and control of the more important diseases of the commonly cultivated crops. Lab. fee $2.25. Mr. Vaughan and staff.

100. Thesis. Yr; 2 cr. Investigation of some problem in plant pathology. Subject should be chosen early, preferably the preceding spring, in order to take advantage of the summer season to secure material. Lab. fee $2.25 per lab. cr. Staff.

101. Diseases of Plants. I; 3 cr. The nature, causes, and remedies of the diseases of economic plants, including field and laboratory studies of a typical series of examples. Prerequisites: Botany 1 and Agr. Bact. 1. Lab. fee $4.50. Mr. Walker, Mr. Gilbert.

102. Methods in Plant Pathology. I; 3 cr. Isolation of parasites, technique of cultural methods, spore germination, and infection. Prerequisite: Plant Path. 101. Lab. fee $4.50. Mr. Riker.

104. Morphology of Fungi. I; 3 cr. Prerequisite: Botany 1. Lab. fee $3.50. Mr. Gilbert.

116. Diseases of Field Crops. II; 2 cr. Arranged to meet the needs of students in plant pathology and agronomy. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Dickson.

117. Diseases of Orchard Fruits. II; 2 cr. A study of the more important diseases of deciduous orchard fruits. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Mr. Keitt.

119. Diseases of Timber. I; 2 cr. A survey of fungi causing rot in living trees and structural timbers, and control measures. Prerequisite: Plant Path. 101. Offered 1931-32 and in alternate years. Lab. fee $2.25. Miss Richards.

120. Diseases of Vegetable Crops. II; 2 cr. A study of the more important field and storage diseases of vegetable crops. Prerequisite: Plant Path. 101. Offered 1932-33 and in alternate years. Lab. fee $2.25. Mr. Walker.

122. Fungicides in Relation to Host and Parasite. II; 1 cr. Advanced course, primarily intended for students specializing in plant pathology and horticulture. Prerequisite: Plant Path. 101. Offered 1932-33 and in alternate years. Mr. Keitt.

149 Special Physiology of Pathogenic Fungi. II; 2 cr. Prerequisite: Botany 146. Mr. Duggar.

200. Research. Yr; *cr. Lab. fee $2.25 per lab. cr. Staff.

220. Advanced Mycology. Yr; 2 cr. Prerequisite: Botany 104. Lab. fee $2.00 per semester. Mr. Gilbert.

221. Classification of Parasitic Fungi. Yr; 1 cr. Prerequisite: Botany 104 or Plant Path. 101. Mr. Davis.

223. Seminary in Plant Pathology. Yr; 1 cr. For advanced and graduate students. Mr. Jones and staff.

252. Cytology of Fungi. II; *cr. Prerequisite: At least one semester of general cytology. Lab. fee $2.00 per cr. Mr. Gilbert.

POULTRY HUSBANDRY

James Garfield Halpin, B.S., *Professor of Poultry Husbandry, Chairman*
John Barry Hayes, B.S., *Associate Professor of Poultry Husbandry*
Gerald Everett Annin, B.S., *Instructor in Poultry Husbandry*
Clayton Ernest Holmes, B.S., *Instructor in Poultry Husbandry*

Students majoring in poultry husbandry may prepare for commercial poultry farming, for one of the various lines of commercial work with which poultry husbandry is related, or for educational work in extension, instruc-

tion, or research. Poultry majors should supplement their training by electing such courses as Animal Husbandry 126, Agr. Chem. 1 and 2, Agr. Econ. 127 and 128, and Genetics 101. Students preparing for educational work along the more scientific lines should elect Chemistry 120, Agr. Chem. 122, Zoology 105 and 109. Opportunities are provided for students majoring in poultry husbandry to become familiar with methods of poultry management by working at the university poultry plant, local hatcheries, etc. Not to exceed five credits from the following courses may be counted as a portion of the major requirement in poultry husbandry: Veterinary Science 125, Diseases of poultry; Animal Husbandry 126, Livestock feeding; Agricultural Chemistry 122, Animal chemistry; Agricultural Economics 127, Cooperative marketing; Agricultural Economics 128, Marketing agricultural products; and Genetics 105, Animal genetics; Agricultural Engineering 2, Farm structures.

1. Poultry Raising. I; 3 cr. A general survey course designed to give the student an understanding of the various problems concerned in poultry raising. Emphasis is given to the study of the various breeds and varieties, breeding and selection for egg production. Optional subject for all agricultural students. Lab. fee $2.25. Mr. Holmes.

8. Marketing Poultry Products. I; 2 cr. A consideration of those factors tending to produce quality in market poultry. Laboratory practice in fattening, dressing, grading, and packing various classes of market poultry; a consideration of those factors tending to produce quality in market eggs. Laboratory practice in candling, grading, and packing market eggs; methods of marketing poultry products. Prerequisite: Poultry Husbandry 1. Lab. fee $2.25. Mr. Holmes.

100. Thesis. Yr; 2 cr. Mr. Halpin, Mr. Holmes.

106. Poultry Judging. I; 3 cr. Origin, history, and points of excellence of the various breeds and varieties of poultry as described in the American Standard of Perfection. A study of the inheritance of common characters in poultry. Prerequisites: Poultry Husbandry 1 or Genetics 101. Lab. fee $2.25. Mr. Halpin.

107. Advanced Poultry Management. II; 3 cr. Influence of recent investigations in poultry husbandry as they affect modern methods of feeding, housing, breeding, care and management of poultry. Special emphasis on rations and practices where poultry is kept on a large scale. Prerequisites: Poultry Husbandry 1 and 2 or Animal Husbandry 126. Mr. Halpin.

200. Research Problems. Yr; *cr. Lab. fee $2.25 per lab. cr. Mr. Halpin, Mr. Holmes.

RURAL SOCIOLOGY

JOHN HARRISON KOLB, Ph.D., *Professor of Rural Sociology, Chairman*
ELLIS LORE KIRKPATRICK, Ph.D., *Associate Professor of Rural Sociology*
ARTHUR F. WILEDEN, M.S., *Assistant Professor of Rural Sociology*

Social and human relationships in modern agriculture are of increasing importance. This is true when viewed from any standpoint, whether of the farm and home, the professional worker as teacher, extension worker, clergy, editor, or the various agricultural industries. Courses in the department seek to give a broad as well as an intensive view of the rapidly changing phases of rural life. Changes imply adjustments in the many social institutions and agencies working in rural society, such as family, school, church, store, newspaper, farmers' organization, or marketing association. Farming needs to be considered as a mode of life and as a series of group relations beginning with the family and extending to the neighborhood, the town-country community and, in these days of rapid travel, even on to the city.

There are at least two ways in which students may work in the field of rural sociology. First, a program leading to a full major and looking toward teaching, research, or extension work may be aranged. In such a plan 10 credits shall be taken in the department and 5 credits selected in any one of the following departments: Agricultural Economics, Agricultural Education, Agricultural Journalism, Horticulture, Home Economics, or Sociology in the College of Letters and Science. Credits thus chosen in Letters and Science may count on the major, but shall not be counted as a portion of the 50 credits required in agricultural subjects. Second, courses in the department may be selected as electives by students majoring in other departments, who wish to gain a wider perspective concerning the social arrangements of present-day rural society.

25. RURAL LIFE. I; 3 cr. A study of modern rural society with special attention to group arrangements and social organizations; the development and adjustments of social institutions as the family, school, church, town-country relations, social welfare agencies; principles and policies of rural community organization. Prerequisite: Sophomore standing. Mr. Kolb.

100. THESIS. Yr; 2 cr. Original work on problems pertaining to rural communities. Staff.

126. RURAL STANDARDS OF LIVING. II; 2 cr. Development of standards of living in rural communities. Consideration of all elements composing the standard of living: food, housing, transportation, education, religion, art, and recreation, in relation to income, trading centers, social institutions, and local groupings. Prerequisite: Junior standing. Mr. Kirkpatrick.

200. RESEARCH. Yr; *cr. Rural social organization and rural life, Mr. Kolb. Rural standards of living, Mr. Kirkpatrick. Community organization and leadership and extension methods, Mr. Wileden.

225. SEMINARY: RURAL SOCIAL ORGANIZATION. I; 2 cr. The theory of rural social organization related to rural population groups, to villages and small-town groups, and to community or county organization policies. Emphasis is given to research methods of study. Prerequisite: Rural Sociology 25, or its equivalent. Mr. Kolb.

SOILS

ANDREW ROBINSON WHITSON, B.S., *Professor of Soils, Chairman*
CLINTON JOSEPH CHAPMAN, B.S., *Professor of Soils*
FRED LUDWIG MUSBACH, B.S., *Professor of Soils*
EMIL TRUOG, M.S., *Professor of Soils*
EDWARD JOHN GRAUL, M.S., *Associate Professor of Soils*
OTTO REINHART ZEASMAN, B.S., *Associate Professor of Soils and Agricultural Engineering*
ARTHUR ROBERT ALBERT, B.S., *Assistant Professor of Soils*
HAROLD HAIGHT HULL, M.S., *Instructor in Soils*

Soils 1 is prerequisite to all other courses in soils. Soils 122 and 126 may be elected by middle course sophomores. Soils 1 and 120 are general in character and are adapted to the needs of all students of agriculture. Advanced students specializing in this subject are advised to elect courses in chemistry, soils bacteriology, plant physiology, agronomy, or geology, according to their special needs, during their senior and graduate years. The summer period is particularly suited to advanced work in soil fertility; for courses offered see summer session bulletin.

GENERAL MAJOR. Students majoring in soils and preparing for practical farming, positions as farm manager, teacher of agriculture, or county agricultural agent, should take Physics 61, 5 cr., Botany 146, 4 cr., and science or mathematics, 5 cr.; and select the courses in soils in the following order: For the sophomore year, 1, 5 cr., 122 or 126, 2 or 3 cr.; for the junior year, 120, 2 cr.; for the senior year 127, 2 cr., 128, 2 cr., and thesis, 4 cr., or 121, 4 cr. In addition to these suggestions, students are urged to elect courses in the Department of Agronomy, Botany, Agricultural Economics, Agricultural Engineering, Animal Husbandry, Agricultural Bacteriology, and Geology to supplement the required work in soils. General majors desiring to teach should consult the chairman of the Department of Agricultural Education concerning requirements not later than the beginning of the junior year.

TECHNICAL MAJOR. Student desiring to prepare for the work of soil surveying, land classification, or field experimentation should follow the general suggestions given above for the general major, but choose supplementary electives from the following group; Agr. Engr. 5, 102; Agronomy 102, 106, 120; Botany 129; Chemistry 11 or 12; Geology 11; Soils 121.

Students preparing to become soil chemists or physicists should take Soils 1, 5 cr., and Soils 122, 3 cr., or 126, 2 cr., in the sophomore year; Soils 127, 2 cr., and Soils 121, 4 cr., in the junior year; and Soils 120, 2 cr., Soils 125, 3 cr., Soils 100, 4 cr., and Soils 128, 2 cr. in the senior year. In addition, Chemistry 12, 3 cr., Geology 17, 3 cr., Agronomy 106, 3 cr., should be elected in the sophomore or junior year; Chemistry 120, 3 or 5 cr., a language, Agronomy 102, 2 cr., and Agr. Bact. 123, 3 cr., in the junior year; Chemistry 130, 5 cr., in the senior year.

Not to exceed 5 credits from the following courses may be counted as a portion of the undergraduate major requirement in Soils; Agr. Bacteriology 123, 3 cr., Geology 1, 5 cr., Geology 17, 3 cr., Agronomy 102, 2 cr., Agronomy 106, 3 cr.

Students are urged to consult a member of the department not later than the second semester of their sophomore year so that a logical sequence of courses may be arranged.

1. Principles of Soil Fertility. I; 5 cr. Discussions and laboratory work on the formation, composition, tilth, and fertility of soils in relation to the growth of plants. Prerequisite: Chemistry 1b or concurrent registration. Lab. fee $4.50. Mr. Graul and staff.

100. Thesis. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Whitson and staff.

120. Soil Management. I; 2 cr. Lectures and field work, maintenance of fertility, including principles of fertilizer practice, and adaptation of system of agriculture to type of soil and climate. Prerequisite: Soils 1. Mr. Whitson.

121. Soil Analysis. II; 4 cr. Lectures and laboratory. Soil acidity methods, limestone analysis, determination of essential elements, availability methods, complete soil analysis. The use of chemical analysis in soil diagnosis. Prerequisites: Soils 1, Chemistry 12. Lab. fee $4.50. Mr. Truog.

122. Soil Physics and Tillage. II; 2-3 cr. Lectures and laboratory. The physical properties of the soil constituents, tilth, soil moisture, heat, in relation to the growth of plants, with practical applications to farm practice. Prerequisite: Soils 1. Lab. fee $2.25 per lab. cr. Offered 1932-33 and in alternate years. Mr. Graul.

125. Soil and Land Classification; Agricultural Climatology. II; 3 cr. Lectures and field work in soil mapping. The principles of climatology and soil and land classification in relation to agriculture, including a study of the soils and climate of the United States and of the chief foreign countries. Prerequisite: Soils 1 or graduate standing. Mr. Whitson.

126. Fertilizers and Manures. II; 2 cr. Lectures and discussions on the composition, manufacture, and characteristics of artificial fertilizers. Methods of application, deportment in the soil, and practical use with and without farm manure. Prerequisite: Soils 1. Offered 1933-34 and in alternate years. Mr. Graul.

127. Soil Science and Plant Nutrition. I; 2 cr. Lectures and discussions. The constitution of the soil, especially as a medium for plant growth. The newer applications of scientific principles to such problems as soil acidity, use of fertilizers, soil amendments, and toxic agents. Prerequisite: Soils 1 or graduate standing. Mr. Truog.

128. Seminary in Soils. I, II; 1 cr. Mr. Whitson, Mr. Truog.

180. Topical Work. Yr; *cr. Mr. Whitson, Mr. Truog, Mr. Graul.

200. Research. I, II; *cr. Lab. fee $2.25 per lab. cr. Mr. Whitson, Mr. Truog, Mr. Graul.

228. Field Course. Yr; 2-4 cr. Soil and crop rotation problems, soil acidity and legumes, farm soil survey, factors determining fertility balance sheet, planning and use of experimental and demonstrational fertilizer plots. Prerequisite: Soils 1. Mr. Whitson, Mr. Musbach, Mr. Albert.

VETERINARY SCIENCE

FREDERICK BROWN HADLEY, D.V.M., *Professor of Veterinary Science, Chairman*
ALEXANDER SEPTIMUS ALEXANDER, F.H.A.S., M.D.C., *Professor of Veterinary Science*
BURR ABRAHAM BEACH, D.V.M., *Associate Professor of Veterinary Science*
CHESTER ALBERN HERRICK, Sc.D., *Assistant Professor of Zoology and Veterinary Science*
CHARLES ROY STRANCE, D.V.M., M.S., *Instructor in Veterinary Science*

The courses described below have been planned to give the students an appreciation of the various branches of veterinary science. They are taught largely by the laboratory method. Besides giving information needed for the intelligent care and management of sick animals, they aid advanced students to secure a knowledge of animal breeding, animal pathology, animal parasitology, and veterinary bacteriology.

1. THE ANIMAL BODY. I; 3 cr. The structure, functions, and derived products of the animal body. The student learns about the form, capacity and productivity of farm animals as well as the fundamentals relative to their feeding and breeding. Optional subject for all agricultural students. Lab. fee $4.50. Mr. Hadley.

2. NON-INFECTIOUS DISEASES OF LIVESTOCK. I; 2 cr. Their causes, symptoms, prevention, and treatment, including conformation and soundness. Mr. Hadley.

100. THESIS. Yr; 2 cr. Mr. Hadley, Mr. Beach, Mr. Herrick.

123. INFECTIOUS DISEASES OF LIVESTOCK. II; 2 cr. Their causes, diagnosis, control and eradication. Prerequisite: A course in veterinary science or bacteriology. Mr. Hadley.

124. TOPICAL WORK. Yr; *cr. Assigned work for advanced students. Mr. Hadley and staff.

125. DISEASES OF POULTRY. II; 2 cr. A study of the more common diseases of poultry. Prerequisite: Vet. Science 1 or Poultry Husb. 1. Offered 1931-32 and in alternate years. Mr. Beach.

126. INFECTION AND IMMUNITY. II; 3 cr. An experimental study of the principles of infection and immunity. Prerequisite: A course in bacteriology: Offered 1932-33 and in alternate years. Lab. fee $4.50. Mr. Hadley and staff.

200. RESEARCH. Yr; 2 cr. Lab. fee $2.25 per lab. cr. Mr. Hadley, Mr. Beach, Mr. Herrick.

PART V—
THE UNDERGRADUATE SCHOOLS

LAW SCHOOL
MEDICAL SCHOOL
SCHOOL OF NURSING
SCHOOL OF EDUCATION

LAW SCHOOL

LLOYD K. GARRISON, DEAN

RAY ANDREWS BROWN, B.A., LL.B., S.J.D., *Professor of Law*
WILLIAM HERBERT PAGE, B.A., LL.M., S.J.D., *Jackson Professor of Law*
WILLIAM GORHAM RICE, JR., LL.B., M.A., S.J.D., *Professor of Law*
OLIVER SAMUEL RUNDELL, LL.B., *Professor of Law*
MALCOLM PITMAN SHARP, M.A., LL.B., S.J.D., *Associate Professor of Law*
RICHARD VALENTINE CAMPBELL, B.A., LL.B., J.S.D., *Assistant Professor of Law*
NATHAN PAUL FEINSINGER, B.A., J.D., *Assistant Professor of Law*
ALFRED LEROY GAUSEWITZ, B.A., LL.B., *Assistant Professor of Law*
HOWARD LEWIS HALL, B.A., LL.B., *Assistant Professor of Law*
FRANK TILDEN BOESEL, Ph.B., LL.B., *Lecturer in Law*
JOHN BELL SANBORN, Ph.D., *Lecturer in Law*

OBJECT OF THE COURSE

The Law School offers a course of study covering a period of three years. It is designed to teach the fundamental principles of the English and American law in a thorough manner, and to fit the student for the active practice of the profession.

ADMISSION

This subject, so far as it bears upon entrance into the University, is fully discussed under the general heading of Admission, page 33.

CANDIDATES FOR THE DEGREE. Applicants for admission to the Law School who expect to become candidates for the degree of Bachelor of Laws are required to have satisfactorily completed either: 1. three full years of college work, equivalent to the first three years of either of the General Courses (B.A. or Ph.B.) in the College of Letters and Science of the University. See pages 55-68 for further details. The satisfactory completion of three yars of work in a general course toward a bachelor's degree in arts, philosophy, or science in any college or university officially recognized by the University of Wisconsin or of any degree course offered by the University of Wisconsin will be regarded as satisfying this requirement; 2. three full years of work leading to the degree of Bachelor of Science in the College of Engineering of the University of Wisconsin. The work offered under this provision must include at least six hours from the field of social sciences.

ADVANCED STANDING. Applicants qualified to enter this Law School as candidates for a degree, who have satisfactorily completed resident work in a law school of good standing, having a three-year course, will be given equivalent rank in this school upon presenting properly authenticated certificates of such work. Credit is given only upon condition that the quality of work at Wisconsin is satisfactory. All persons who intend to apply for advanced standing under the above rule should forward or persent their credentials to the Dean of the School at least two weeks before the opening of the particular session which the student desires to attend.

UNCLASSIFIED STUDENTS. Applicants for admission who are not candidates for the law degree may be admitted as unclassified students provided they have met the general university entrance requirements and have satisfactorily completed two full years of college work, equivalent to the first two years of a general course in the College of Letters and Science at this University. Such unclassified students are subject to all the regulations and requirements of the School excepting those pertaining to graduation, and they are entitled to all the instructional facilities afforded other students. An opportunity is thus given to prepare for bar examinations in this and other states.

FEES AND EXPENSES

See section entitled Student Expense, beginning on page 15.

PRE-LEGAL STUDIES

The student should bring to the study of law, habits of concentration and industry and the intellectual tolerance that results from a course of liberal studies in a college of liberal arts. No prescribed course is practicable or desirable. A student whose interests and tastes incline him to the study of law will naturally select many electives from the field of the social sciences—economics, sociology, history, philosophy, psychology, political science. (See recommendations of the Law School faculty, section 19, page 61.) A knowledge of Latin is not indispensable to law but its study is strongly recommended, not only for its disciplinary and cultural value, but as a means of developing a clear English style in writing and speaking. The fundamental doctrines of the law dealing with the rights of the person and of property should be studied in their historical background. A student preparing for law should be well grounded in the history of England and the United States, particularly in those courses of an institutional character. Students who desire to pursue advanced work in Roman law, jurisprudence, or the history and philosophy of law, will find a reading knowledge of German and French indispensable.

As described in detail in section 19, page 61, students of the College of Letters and Science, who have completed the requirements of the first three years of one of the general courses may, in their senior year, elect the subjects required of first-year students in the Law School and credit this work toward both the arts and law degrees. By so arranging his work, a student may earn his B.A. degree at the end of four years and his LL.B. degree at the end of an additional two years, plus the period of office apprenticeship as described below under the heading of Graduation, paragraph (3).

REQUIRED AND ELECTIVE COURSES

Candidates for the degree are required to take all the subjects of the first year, twelve hours of work in the second year, and twelve hours in the third year. The course in Professional Conduct is required; the other second and third-year courses are elective. Elections in all cases are subject to the approval of the Dean.

PROCEDURE AND PRACTICE COURSES

Courses in procedure and practice extend throughout the last two years and comprise Evidence, four credits; Office Practice, two credits; Pleading, four credits; Practice, four credits; Practice Court, one credit. The purpose of the courses is to instruct the student in the principles of pleading and practice at common law and under the codes, and to give facility in their application by duplicating as far as possible the steps taken by an active practitioner in the preparation for trial of cases at law and in equity throughout the entire field of litigation. In Practice Court, the student prepares pleadings in assigned cases and carries a cause of action through the various steps from its inception to the final judgment. The course in office practice involves the drafting of ordinary legal documents, such as bills of sale, deeds, wills, and articles of incorporation, and the examination of abstracts of title.

STUDIES OUTSIDE THE LAW SCHOOL

Students of the Law School may pursue, without additional fees, studies in other departments of the University for which they are prepared, in so far as such studies do not interfere with their work in the Law School. Before registering in other departments, the student must obtain permission from the Dean of the Law School. Credit toward the law degree will be granted for Economics 208; no credit toward the law degree is given for other studies taken outside the Law School.

REQUIREMENTS FOR GRADUATION

The degree of Bachelor of Laws will be conferred upon all candidates who are at least 21 years of age, who are of good character, who, in the judgment of the Faculty, possess satisfactory legal attainments, and who have complied with the following conditions:

(1) Completion of seventy-four credits with a weighted average of seventy-seven.

(2) Residence of at least three years in a law school of good standing, having a three-year course, the last year of which must have been in this School.

(3) An apprenticeship of not less than six months in a law office, except as provided below. This requirement must be absolved at a time when the candidate is not in attendance upon the University. At the option of the candidate the requirement may be met by two periods of not less than three months each. The requirement must be entirely absolved after the student shall have received credit for not less than twenty semester hours in the Law School. Credit for office study will not be granted unless the student complies with the following regulations: (a) At the beginning of the clerkship, he must file a certificate by his preceptor stating the date on which the clerkship began. (b) A like certificate showing the date of completion of the clerkship must be filed at the completion of the period. (c) A monthly report, signed by the student and endorsed by the preceptor, showing the kind and amount of work assigned to the student during the period of the report must also be filed.

A candidate for graduation who has obtained credit for the courses in evidence, pleading, practice, office practice, and practice court, who has obtained at least 82 credits with a weighted average of 77, and who has a residence of at least three years and three months in a law school of good standing, having a three-year course, the last year of which must have been in this School, will be relieved from the requirement of office clerkship.

Students completing the course with distinguished excellence may be recommended for the degree with honor.

ADMISSION TO THE BAR

The statutes of the state provide that any resident graduate of the Law Department of the University of Wisconsin shall be admitted to practice in all of the courts of this state by the Supreme Court upon the presentation of his diploma, and may be admitted to the Supreme Court when not in session by an order signed by one of the justices thereof and filed with the clerk of said court. (R. S. Wis., sec. 256.28.)

Under this statute and a rule of the federal court, it is customary for the graduating class, on motion of a member of the Faculty, to be admitted to the Supreme Court of the state and to the district and circuit courts of the United States immediately upon graduation. This entitles them to admission to the bar of any court of record in Wisconsin and all federal courts in the state.

THE ORDER OF THE COIF

The Order of the Coif is an honorary legal society having for its purpose the encouragement of scholarship and the advancement of ethical standards in the legal profession. Membership in it is dependent entirely upon the attainment of high scholastic standing. The name of the society is taken from the Order of Sergeants of the English bar. This Order is now extinct, but during its day it represented a select group of lawyers eminent for learning and professional attainments. The society has chapters in most of the leading law schools of the country. The Wisconsin chapter was established in 1907. Candidates for the law degree are elected to membership during the last semester of their third year.

WISCONSIN LAW REVIEW

The *Wisconsin Law Review* was established in 1920 by authority of the Regents. The *Review* appears quarterly, and deals primarily with questions in Wisconsin law and legal problems of particular interest to Wisconsin lawyers. The Board of Editors consists of the law faculty and a board of fourteen student editors selected from the student body. Eligibility to the board is determined largely by scholastic standings.

LIBRARY

The library of the Law School contains 43,000 bound volumes, comprising the official reports of the various states and territories and of the United States; a complete set of English, Irish, and Canadian reports; Australian Reports; the Reporter System; the various series of selected cases, as: American Decisions; American Reports; American State Reports; Lawyers Reports Annotated; Ruling Case Law; Corpus Juris; American Law Reports; British Ruling Cases; duplicates of the more important reports; complete sets of the leading law periodicals; the leading encyclopedias of law and other works of reference; a large collection of textbooks, statutes, digests, etc.

MORTIMER M. JACKSON PROFESSORSHIP OF LAW

The late Judge Mortimer M. Jackson by his will gave $20,000 to the University, the income to be used to maintain a chair of law. The Regents in 1890 formally established the Mortimer M. Jackson Professorship of Law. Judge Jairus H. Carpenter, for many years Dean of the Law School, was the first incumbent of this chair, which he held until his death in 1913. Professor Howard L. Smith held the professorship until his retirement in June 1926, and Dean Harry S. Richards from 1926 until his death in April 1929. Since June 1929 Professor W. H. Page has been the incumbent.

SUMMER SESSION

June 20 to August 26, 1932

The summer session of the Law School extends over a period of ten weeks. The work is carried on in the same manner and with the same thoroughness as during the regular session. Courses are arranged to meet the needs of beginning and advanced students. The courses are the equivalents of those given in the first, second, and third years of the long session and carry full credit toward the law degree. Full work during the summer session consists of twelve hours per week. Written examinations are held at the completion of the courses. Students successfully completing courses aggregating twelve hours per week for the summer will receive credit for one-third of a regular academic year's work. The session thus enables students of this and other law schools and teachers or students in the College of Letters and Science who have completed the equivalent of three years of college work to shorten considerably the calendar period of residence required here and elsewhere for the law degree. The courses are so arranged as to be of service to practicing lawyers who may wish to pursue systematic investigation of particular subjects.

During the summer of 1932 the following courses will be offered:

For first-year students: Contracts, Personal Property. For second and third-year students: Constitutional Law. Conveyancing, Damages, Equity II, Partership, Persons, Quasi-Contracts, Trusts.

COURSES OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
cr.—number of credit hours per semester

FIRST YEAR

AGENCY. I; 2 cr. Mr. Rice.

CONTRACTS. Yr; 3 cr. Mr. Page.

CRIMINAL LAW. Yr; 2 cr. Mr. Gausewitz.

EQUITY I. II; 2 cr.

INTRODUCTION TO LAW. I; 2 cr. Mr. Sharp.

PERSONAL PROPERTY. I; 2 cr. Mr. Brown.

REAL PROPERTY. II; 2 cr. Mr. Brown.

TORTS. I; 3 cr; II, 4 cr. Mr. Campbell.

SECOND AND THIRD YEARS

ADMINISTRATIVE LAW. I; 2 cr. Mr. Brown.

AGENCY. I; 2 cr. Mr. Rice.

BANKRUPTCY. I; 2 cr. Mr. Hall.

BILLS AND NOTES. I; 4 cr. Mr. Sharp.

BUSINESS ASSOCIATIONS (Seminary). II; 2 cr. Mr. Sharp.

BUSINESS WRONGS. II; 3 cr. Mr. Brown.

CONFLICT OF LAWS. I; 3 cr. Mr. Page.

CONFLICT OF LAWS SEMINARY. II; 2 cr. Mr. Page.

CONSTITUTIONAL LAW. II; 4 cr. Mr. Rice.

CONSTITUTIONAL LAW (Seminary). I; 2 cr. Mr. Brown.

CONTRACTS (Seminary). I; 2 cr. Mr. Page.

CONVEYANCING. I; 3 cr. Mr. Rundell.

CONVEYANCING (Seminary). II; 2 cr. Mr. Rundell.

CORPORATIONS. II; 4 cr. Mr. Sharp.

DAMAGES. I; 2 cr. Mr. Hall.

DOMESTIC RELATIONS (Seminary). I; 2 cr. Mr. Feinsinger.

EQUITY II. I; 3 cr. Mr. Garrison.

EVIDENCE. I; 4 cr. Mr. Gausewitz.

FUTURE INTERESTS. II; 4 cr. Mr. Rundell.

HISTORY OF ANGLO-AMERICAN LAW. I; 2 cr. Mr. Page.

INSURANCE. I; 3 cr. Mr. Feinsinger.

INTERNATIONAL LAW. II; 3 cr. Mr. Rice.

INTRODUCTION TO JURISPRUDENCE. II; 2 cr. Mr. Sharp.

LABOR LAW (Seminary). I; 2 cr. Mr. Rice.

MORTGAGES. I; 2 cr. Mr. Rundell.

MUNICIPAL CORPORATIONS. II; 2 cr. Mr. Campbell.

OFFICE PRACTICE. II; 2 cr. Mr. Gausewitz.

PARTNERSHIP. II; 3 cr. Mr. Feinsinger.

PERSONS. I; 3 cr. Mr. Feinsinger.

PLEADING. Yr; 2 cr. Mr. Boesel.

PRACTICE. Yr; 2 cr. Mr. Sanborn.

PRACTICE COURT. I; 1 cr. Mr. Gausewitz.

PROFESSIONAL CONDUCT. II; 1 cr. Mr Campbell

PUBLIC UTILITIES. I; 4 cr. Mr. Rice.

QUASI-CONTRACTS. II; 2 cr. Mr. Feinsinger.

SALES. I; 3 cr. Mr. Hall.

SERVITUDES. II; 3 cr.

SURETYSHIP. I; 2 cr. Mr. Hall.

TAXATION. II; 3 cr. Mr. Brown.

TRUSTS. II; 4 cr. Mr. Hall.

TRUSTS (Seminary). II; 2 cr. Mr. Hall.

WILLS. I; 3 cr. Mr. Page.

FOR STUDENTS IN THE SCHOOL OF COMMERCE

COMMERCIAL LAW. I; 2 cr. Mr. Campbell, Mr. Feinsinger.

CORPORATION LAW. II; 2 cr. Mr. Feinsinger.

MEDICAL SCHOOL

C. R. Bardeen, Dean

ADMISSION

It is understood that all applicants for admission to the Medical School must have satisfied the general entrance requirements of the University, either by satisfactory completion of certain prescribed work in some recognized secondary school, including graduation therefrom, or by passing entrance examinations. See Admission, page 33, for details.

Before being permitted to matriculate in the Medical School, candidates are required to have satisfactorily completed at least two full years of college work, including the following:

1. English composition—6 credits. This subject is to be carried during the freshman year at the rate of 3 credits per semester.

2. Foreign language—two years for a total of 14 to 16 credits. This includes specifically: (a) a knowledge of elementary Latin, obtained by the satisfactory completion of either two years of this language in high school or one year in college; (b) a reading knowledge of either French or German, as evidenced by the completion of the fourth semester of this language at the University of Wisconsin with a satisfactory grade, or by a certificate of reading knowledge from the appropriate department at this University. If the candidate has had no high-school work in Latin, French, or German, it will be necessary for him to carry 24 to 26 credits of foreign language in college unless he can gain a reading knowledge of French or German by private study.

3. Science—successful completion of laboratory courses in physics, general and organic chemistry, and biology. In addition, students are advised to take one semester of quantitative analysis and a course in comparative anatomy before commencing their medical work. The required science studies are here briefly summarized; they or their equivalents may be pursued either at the University of Wisconsin in the regular year or the summer session, or in some other college.

	Credits	Hours of Class Work	Hours of Lab. Work
General chemistry and qualitative analysis	10	128	192
Organic chemistry	4–6	48	96
General physics	10	128	128
Biology, preferably animal biology	10	128	192
	34–36	432	608

ADMISSION WITH ADVANCED STANDING

First-Year Class: A student wishing to apply for admission to this class should send an official copy of his premedical credentials to the Dean of the Medical School not later than May 1 of the year in which he wishes to matriculate. If the credentials are satisfactory, an application blank will be sent to the candidate for admission, to be filled out and returned to the Dean of the Medical School.

All students entering from other institutions are required to pass a reading knowledge examination in either German or French given by the appropriate department at Wisconsin before the time of matriculation.

SECOND-YEAR CLASS: There is seldom a vacancy in this class and students from other institutions are not encouraged to apply for admission.

THIRD- AND FOURTH-YEAR CLASSES: At the present time no applications to these classes are accepted.

COURSES OF STUDY AND DEGREES

The Medical School offers a four-year course leading to the degree of Doctor of Medicine. The requirements are outlined below. The Graduate School offers the degrees of Master of Arts, Master of Science, Master of Public Health, Doctor of Public Health, and Doctor of Philosophy to students who complete their requirements for these degrees by work in the medical sciences. The College of Letters and Science grants the degree of Bachelor of Science (Medical Science) to students who complete two years of prescribed premedical work and the first two years of the regular medical course; also the degree of Bachelor of Arts to students who complete the regular requirements for this degree as described on pages 55-67 and who during their senior year complete a major in medical science. See section 16, page 57.

CHOICE OF PREMEDICAL COURSES

The student who enters the College of Letters and Science with the intention of studying medicine should arrange at the office of the Assistant Dean of the Medical School a schedule of studies which will enable him to complete the required premedical college work within the period which he desires to devote to preparation for the medical course.

The minimum time required for the completion of this premedical work is two years. If three or four years are spent on premedical college work, the student has the choice of either broadening his course of study or of taking more advanced work in some special line. All good American medical schools now require at least two years of premedical college work, many require at least three years of college work, and a few require a bachelor's degree for entrance. If a student expects to take his medical course or to complete the clinical part of it elsewhere, he should keep this in mind when arranging the premedical schedule. He should likewise acquaint himself with the special premedical requirements maintained by the school of his choice.

The general regulations governing freshmen and sophomores in the College of Letters and Science apply to premedical students, excepting that those in the two-year course are permitted to take 17 or 18 credits per semester as circumstances may require. See pages 50-54. Each candidate for a bachelor's degree in either of the premedical courses is required to present a graduating thesis, the subject of which must be approved by the student's adviser and the chairman of the department of his major. This thesis must represent some phase of the student's work in his major study and must have the character of a scholarly dissertation on the subject.

PREMEDICAL CURRICULA

RECOMMENDED SEQUENCE FOR THE TWO-YEAR COURSE

LEADING EVENTUALLY TO THE DEGREE OF BACHELOR OF SCIENCE (MEDICAL SCIENCE)

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman English	3	Engl. 1b—Freshman English	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
Physics 1 or 31—General physics	5	Physics 1 or 31—General physics	5
French 1a or German 1a	4	French 1b or German 1b	4
Physical activity requirement	0	Physical activity requirement	0
	17		17

SOPHOMORE YEAR

Chem. 20, 21, or 120, 121—Organic chem.	4-5	Zoology 2 or 104	5
Zoology 1—Animal biology	5	French 10b or German 2b	3
French 10a or German 2a	3	Latin 2—Caesar	5
Latin 1—Elementary Latin	5	Elective if Latin was taken in high school	(5-6)
Elective if Latin was taken in high school	(4-3)	Free elective	3-2
Physical activity requirement	0	Physical activity requirement	0
	16-18		15-16

RECOMMENDED SEQUENCE FOR THE THREE-YEAR COURSE

LEADING EVENTUALLY TO THE DEGREE OF BACHELOR OF ARTS

FRESHMAN YEAR

Engl. 1a—Freshman English	3	Engl. 1b—Freshman English	3
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
French 1a or German 1a	4	French 1b or German 1b	4
History or mathematics	3-4	History or mathematics	3-4
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

SOPHOMORE YEAR

Engl. 30a or 33a—Sophomore literature	3-2	Engl. 30b or 33b—Sophomore literature	3-2
Chem. 20, 21, or 120, 121—Organic chem.	4-5	Zoology 2 or 104	5
Zoology 1—Animal biology	5	French 10b or German 2b	3
French 10a or German 2a	3	Elective	5
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

JUNIOR YEAR

Physics 1 or 31	5	Physics 1 or 31	5
Foreign language	4-5	Latin 2—Caesar	5
Latin 1—Elementary Latin	5	Foreign language	4-5
Electives if foreign language and Latin were pursued in high school	(10)	Electives if foreign language and Latin were pursued in high school	(10)
	14-15		14-15

MEDICAL COURSES

Two courses are offered, a two-year course and a four-year course.

The *two-year course,* established in 1907, covers the preclinical half only of a four-year medical course and embraces the basal and intermediate groups of studies. Combined with the two or three years of premedical work, this course leads to the degree of Bachelor of Science (Medical Science). On completion of this course, the student is expected to go elsewhere to complete the medical curriculum. Owing to the fact that opportunities for admission to the third year are few in most medical schools, this course is ordinarily limited to fifty students. Selection is made on the basis of premedical scholarship. Students are not promoted to the second year of the course until the completion of all of the required work of the first year with grades of C or better.

The *four-year course,* established in 1925, embraces the basal and intermediate groups of the two-year course and in addition two years of clinical instruction at Madison and at the associate clinical teaching centers. Students are required to obtain a bachelor's degree before being admitted to the two years of clinical instruction. Upon the successful completion of the latter, the degree of Doctor of Medicine is granted. Owing to the necessity of restricting clinical instruction at the Wisconsin General Hospital so as to make such instruction facilitate, not hamper, care of patients, this four-year class is limited to fifty students or fewer. Selection is made on the basis of premedical scholarship. Students are not promoted from one year of the course to the next unless the required work of the year is completed with grades of C+ and B or better in all subjects.

Transfer from the two-year to the four-year course can be made only in case vacancies occur in the latter. When such transfers take place, selection of students to fill the vacancies will be made on the basis of scholarship.

COURSE IN MEDICINE

LEADING TO THE DEGREE OF DOCTOR OF MEDICINE

FIRST YEAR

First Semester	Credits	Second Semester	Credits
Anatomy 110—Histology and organology	5	Anatomy 121—Gross anatomy	6
Anatomy 121—Gross anatomy	7	Anatomy 126—Neural anatomy	5
Physiological Chemistry 104	4	Physiology 105—Medical physiology	7
Physiology 105—Medical physiology	2		
	18		18

SECOND YEAR

Bact. 102—Medical bacteriology	4	Medicine 102—Clinical laboratory diagnosis	3
Hygiene 101—Public health	2	Medicine 111—Medical diagnosis	2
Pathology 101b—Special pathology	2	Pathology 101b—Special pathology	2
*Pathology 101—General pathology	4	Pharmacology 104-105	4
Medicine 110—Physical diagnosis	3	Surgery 102—Surgical clinics	1
Thesis	2	Surgery 103—Elements of surgery	1
		Thesis	2
	17		15

*Until Christmas recess.

THIRD YEAR

First Semester

	Credits
Medicine 301—Third-year medicine	6
Medicine 305—Therapeutics	1
Medicine 310—Pediatrics	1
Medicine 315—Dermatology	1
Surgery 301—Third-year surgery	6
Surgery 310—Ophthalmology	1
Surgery 330—Obstetrics and gynecology	2
	18

Second Semester

	Credits
Medicine 301—Third-year medicine	5
Medicine 312—Neuropsychiatry	2
Surgery 301—Third-year surgery	4
Surgery 311—Rhinology, otolaryngology	1
Surgery 315—Orthopedics	1
Surgery 325—Urology	1
Surgery 330—Obstetrics and gynecology	1
Surgery 314—Plastic surgery	1
Surgery 316—Physical therapy	1
Surgery 320—Radiography and radio therapy	1
	18

FOURTH YEAR

Hygiene 401—Sanitation and public health	1
Medicine 401—Internal medicine	4. 5
Medicine 410—Pediatrics	2. 5
Medicine 412—Neuropsychiatry	3
Medicine 415—Dermatology	1
Medicine 420—Medical jurisprudence and ethics	1
Surgery 406—Obstetrics and gynecology	2
Surgery 416—Applied physical therapy	1
Surgery 405—Applied radiology	1
Surgery 401—General surgery	3
Surgery 410—Ophthalmology	1
Surgery 411—Rhinology, laryngology, otology	1
Surgery 425—Urology	2
Surgery 415—Orthopedic surgery	1
Thesis	3
Associate quarter	10
Milwaukee quarter	10
	48

DEPARTMENTS OF INSTRUCTION

For a description of the courses in botany, zoology, chemistry, physics, psychology, and languages, see departmental announcements in the College of Letters and Science.

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters.
I—course given during the first semester.
II—course given during the second semester.
I, II—semester course given each semester.
cr—number of credit hours per semester.
*—to be arranged.

Courses numbered from 1 through 100 are open for credit to undergraduates only; from 101 to 199 to both undergraduates and graduates; over 200 to graduates only, or very exceptionally to advanced undergraduates.

ANATOMY

WALTER EDWARD SULLIVAN, Ph.D., *Professor of Anatomy, Chairman*
CHARLES RUSSELL BARDEEN, B.A., M.D., *Professor of Anatomy*
WILLIAM SNOW MILLER, M.D., Sc.D., *Professor of Anatomy, Emeritus*
THEODORE HIERONYMUS BAST, Ph.D., *Associate Professor of Anatomy*
FREDERICK DENKMAR GEIST, M.D., *Assistant Professor of Anatomy*
OTTO AXEL MORTENSEN, M.S., M.D., *Assistant Professor of Anatomy*
HARLAND WINFIELD MOSSMAN, Ph.D., *Assistant Professor of Anatomy*
JOHN HOLDEN ROBBINS, B.S., M.D., *Instructor in Anatomy*

There is offered a group of courses planned for a comprehensive view of the gross and microscopic anatomy and embryology of mammals, with especial reference to man. Opportunities are offered for advanced work and research. The laboratory is thoroughly equipped with apparatus, models, books, and materials.

39. PHYSICAL EDUCATION ANATOMY. I; 3 cr. Lectures and laboratory work for students of physical education. Prerequisite: Zoology 1. Lab. fee $5.00. Dr. Sullivan.

110. HISTOLOGY AND ORGANOLOGY. I; 5 cr. The study of the tissues, followed by a study of the structure of the mammalian organs. Histogenesis and some organogenesis are included. Prerequisites: Junior standing, Zoology 1. Lab. fee $20.00. Dr. Bast, Dr. Geist, and staff.

120. HUMAN ANATOMY. II; 6 cr. For students of physical education. An opportunity to dissect is offered. Prerequisite: Zoology 17. Lab. fee $10.00. Dr. Bardeen.

121. HUMAN ANATOMY. I, 7 cr; II, 6 cr. In this course a thorough training is offered in the dissection of the human body and in descriptive human anatomy. Organogenesis is in part included. Prerequisites: Junior standing, Zoology 1. Lab. fee $17.50 per semester. Dr. Bardeen, Dr. Sullivan, Dr. Mossman, Dr. Mortensen.

122. APPLIED ANATOMY. Yr; 2-4 cr. This course is given with the cooperation of the clinical staff. Dissections, cross-sections, models, and charts are used to review the anatomy of the human body. Along with this is a discussion of the clinical significance of the structures in question. Not more than two credits can be counted toward thesis. Prerequisite: Anatomy 121. Lab. fee $5.00. Dr. Robbins.

126. THE ANATOMY OF THE NERVOUS SYSTEM. II; 5 cr. Dissection of the human brain and study of the microscopic anatomy of the central nervous system and sense organs. Neurogenesis is included in this course. Prerequisite: Anatomy 110. Lab. fee $15.00. Dr. Geist, Dr. Bast, and staff.

131. HISTORICAL SEMINARY. II; 1 cr. Dr. Miller.

200. RESEARCH. *cr. To qualified students the department is prepared to offer problems for investigation and training in methods of research. Special arrangements for this work may be made with the individual members of the staff. The department also welcomes independent investigators who wish to make use of its facilities for conducting research in anatomy. Lab. fee $5.00.

HYGIENE

In conjunction with the staffs of the State Laboratory of Hygiene, the Wisconsin Psychiatric Institute, the State Board of Health, and the Boards of Health of the cities of Milwaukee and Madison, courses in hygiene are offered by members of the faculty of the Medical School under the general supervision of Professor Stovall.

5. DISEASE PREVENTION. II; 2 cr. The more important aspects of personal and public hygiene; designed especially for general students who desire a knowledge of community and personal hygiene. Dr. Clark.

101. PUBLIC HEALTH. I; 2 cr. Lectures and field work for medical students. Given in conjunction with Bacteriology 102. Prerequisite. Second-year medical standing. Dr. Clark, Dr. Harper, Dr. Stovall.

102. BACTERIOLOGY FOR HEALTH OFFICERS. I; 4 cr. Given in conjunction with medical bacteriology but with special work in the State Laboratory of Hygiene and some special lectures. Lab. fee $15.00. Dr. Clark, Dr. Stovall.

401. PRACTICAL FIELD WORK. I, II; 1 cr. Prerequisite: Fourth-year medica standing.

MEDICAL DIVISION

GENERAL MEDICINE

JOSEPH SPRAGG EVANS, B.A., M.D., *Professor of Medicine, Chairman*
ROBERT VAN VALZAH, B.A., M.D., *Professor of Clinical Medicine*
WILLIAM SHAINLINE MIDDLETON, M.D., *Associate Professor of Medicine*
ELMER LOUIS SEVRINGHAUS, M.A., M.D., *Associate Professor of Medicine*
RAY CARRINGTON BLANKINSHIP, M.D., *Associate Professor of Clinical Medicine*
SARAH ISABELLE MORRIS, M.D., *Associate Professor of Clinical Medicine*
KARVAR LOUIS PUESTOW, M.S., M.D., *Assistant Professor of Clinical Medicine*
SAMUEL HAMILTON CHASE, D.D.S., *Lecture in Oral Hygiene.*
HARRY MAXWELL KAY, M.D., *Associate in Clinical Medicine*
JOHN EDWARDS BENTLEY, B.S., M.D., *Instructor in Clinical Medicine*
ALBERT JAY BONER, B.S., M.D., *Instructor in Clinical Medicine*
MARIE LOUISE CARNS, M.A., M.D., *Instructor in Clinical Medicine*
CHESTER MOTT KURTZ, M.S., M.D., *Instructor in Clinical Medicine*
LINDLEY VINCENT SPRAGUE, M.D., *Instructor in Clinical Medicine*
PATRICIA M. WERRELL, B.A., *Instructor in Electrocardiography*
FRANK LAWRENCE WESTON, B.S., M.D., *Instructor in Clinical Medicine*

110. PHYSICAL DIAGNOSIS. I; 3 cr. Normal physical diagnosis. Prerequisites: Anatomy 110, 121, 126; Physiology 105. Lab. fee $5.00. Dr. Van Valzah.

111. MEDICAL DIAGNOSIS. II; 2 cr. Pathological clinical diagnosis. Prerequisites: One semester each of Pathology 101, Bacteriology 102, Medicine 110. Lab. fee $5.00. Dr. Van Valzah.

118. PHYSICAL EXAMINATIONS. II; 3 cr. For students in physical education. Prerequisites: Anatomy 120, Physiology 115. Dr. Morris.

200. ADVANCED WORK AND RESEARCH. * cr.

301. THIRD-YEAR MEDICINE. I, 6 cr; II, 5 cr. Lectures, clinics, conferences, and ward work. Prerequisites: Medicine 102, 110, 111, Surgery 102, 103. Lab. fee $25.00. Dr. Evans, Dr. Middleton, and staff.

302. ORAL HYGIENE. II. Included in 301. Dr. Chase.

305. THERAPEUTICS. I, II; 1 cr. Prerequisites: Medicine 102, 111. Given in conjunction with Department of Pharmacology. Dr. Evans and staff.

306. ADVANCED WORK AND RESEARCH IN THERAPEUTICS. * cr. Given in conjunction with Department of Pharmacology.

401. INTERNAL MEDICINE. I, II; 4½ cr. Prerequisites: Medicine 301, Surgery 301.

CLINICAL PATHOLOGY

WILLIAM DAVISON STOVALL, M.D., *Professor of Hygiene*
WILLIAM E. BAYLEY, M. D., *Instructor in Clinical Pathology*

102. CLINICAL LABORATORY DIAGNOSIS. II; 3 cr. Prerequisites: Bacteriology 102, Pathology 101, Physiological Chemistry 104. Lab. fee $10.00. Dr. Stovall and staff.

DERMATOLOGY

OTTO HOTTINGER FOERSTER, M.D., *Professor of Dermatology*
HARRY ROBERT FOERSTER, B.S., M.D., *Assistant Professor of Dermatology*
ROSCOE LYLE MCINTOSH, B.S., M.D., *Assistant Professor of Dermatology*

200. ADVANCED WORK AND RESEARCH. *cr. Lab. fee $5.00.

315. DERMATOLOGY. I; 1 cr. Prerequisites: Medicine 102, 111.

415. FOURTH-YEAR DERMATOLOGY. I, II; 1 cr. Prerequisite: Medicine 315. Through the courtesy of the Drs. Foerster of Milwaukee, this course is given in Milwaukee, and through the courtesy of the directors of the Milwaukee City Dispensary, the work is in part carried on there.

MEDICAL JURISPRUDENCE AND MEDICAL ETHICS

420. MEDICAL JURISPRUDENCE AND MEDICAL ETHICS. 1 cr. Assigned reading and examination.

PEDIATRICS

JOHN EUGENE GONCE, JR., B.A., M.D., *Associate Professor of Pediatrics*
HORACE KENT TENNEY, M.D., *Assistant Professor of Pediatrics*

200. RESEARCH. *cr. Lab. fee $5.00.

310. PEDIATRICS. I; 1 cr. Prerequisites: Medicine 102, 111.

410. FOURTH-YEAR PEDIATRICS. I, II; 2½ cr. Prerequisite: Medicine 310. Through the courtesy of the Board of Directors and of the Medical Staff of the Children's Hospital of Milwaukee, each fourth-year student is given three weeks' special training in pediatrics at this hospital. This work is given by members of the staff of the hospital, of which Dr. A. J. Kastner is at present chief.

NEUROPSYCHIATRY

WILLIAM FREDERICK LORENZ, M.D., *Professor of Neuropsychiatry, Chairman*
WILLIAM JEFFERSON BLECKWENN, B.S., M.D., *Associate Professor of Neuropsychiatry*
HANS HEINRICH REESE, M.D., *Associate Professor of Neuropsychiatry*
MABEL GARDEN MASTEN, B.S., M.D., *Assistant Professor of Neuropsychiatry*
MORTON KAY GREEN, M.D., *Clinical Associate in Neuropsychiatry*
FRANCIS PAUL, M.D., *Clinical Associate in Neuropsychiatry*
AUGUST SAUTHOFF, B.S., M.D., *Clinical Associate in Neuropsychiatry*
MARK EDWIN NESBIT, M.D., *Research Associate in Neuropsychiatry*

112. PROBLEMS IN NEUROPSYCHIATRY. Credit according to work done. Dr. Lorenz and staff.

200. RESEARCH. Yr; *cr. Staff. Lab. fee $5.00.

312. THIRD-YEAR NEUROPSYCHIATRY. II; 2 cr. Prerequisites: one semester of Medicine 310 and Surgery 301. Dr. Lorenz and staff.

412. FOURTH-YEAR NEUROPSYCHIATRY. I, II; 3 cr. Prerequisite: Medicine 312.

PATHOLOGY AND MEDICAL BACTERIOLOGY

CHARLES HENRY BUNTING, B.S., M.D., *Professor of Pathology, Chairman*
PAUL FRANKLIN CLARK, Ph.D., *Professor of Medical Bacteriology*
GORTON RITCHIE, B.A., M.D., *Assistant Professor of Pathology*
FRANCES ELIZABETH HOLFORD, Ph.D., *Instructor in Bacteriology*

4. BACTERIOLOGY FOR NURSES. I; 2 cr. Dr. Clark.

102. MEDICAL BACTERIOLOGY. I; 4 cr. This course, which is especially designed for medical students, considers the bacteria and protozoa that are concerned in the production of disease processes. Weekly lectures in immunology. Prerequisites: Chemistry 1, Zoology 1. Lab. fee $15.00. Dr. Clark and staff.

103. EXPERIMENTAL PATHOLOGY. II; 4 cr. In this course by suitable experiments the work of Course 101 is supplemented and elaborated. It may be taken for thesis credit. Prerequisites: Anatomy 110, 126. Dr. Bunting.

104. IMMUNOLOGY. II; 3-4 cr. May be taken as a thesis course. It includes experimental work with the commonly employed clinical serological tests such as the Wassermann reaction, as well as laboratory experiments with the various antibody and cellular factors in resistance. Lab. fee $8.00. Dr. Holford.

106. ADVANCED BACTERIOLOGY. I, II; *cr. Lab. fee $2.00. per cr. Dr. Clark.

108. BACTERIOLOGY SEMINAR. Yr; 1 cr. Dr. Clark.

201. ADVANCED PATHOLOGY. II; *cr. Dr. Bunting.

301. CLINICAL PATHOLOGICAL CONFERENCES. Given as a part of Medicine 301. Dr. Bunting and members of medical and surgical staffs.

PHARMACOLOGY AND TOXICOLOGY

ARTHUR LAWRIE TATUM, Ph.D., M.D., *Professor of Pharmacology, Chairman*
MAURICE HARRISON SEEVERS, B.A., Ph.D., *Assistant Professor of Pharmacology*
RORERT PORT HERWICK, M.S., Ph.D., *Assistant Professor of Toxicology*

Elementary and advanced courses in pharmacology and toxicology are offered in this department. For the elementary courses a previous training in physiological chemistry and physiology is required. The advanced courses are open to those who have had adequate elementary training. The laboratory is specially fitted for research in chemotherapy.

101. TOXICOLOGY. II; 1 cr. Lectures on the general action of toxic drugs, the diagnosis and treatment of poisoning, the preparation of autopsy material for subsequent chemical analysis in medico-legal cases, and general questions of medical jurisprudence. Prerequisites: Physiology 105, Physiological Chemistry 104. Dr. Herwick.

104. PHARMACOLOGY. II; 2 cr. Lectures on the chemistry, the pharmacological and toxicological action, and the therapeutic uses of the chief medicinal drugs. Practice in prescription writing. Prerequisites: Physiology 105, Physiological Chemistry 104. Dr. Tatum, Dr. Seevers.

105. PHARMACOLOGY. II; 2 cr. Laboratory course. Experimental studies on the action of drugs. Prerequisites: Physiology 105, Physiological Chemistry 104. Lab. fee $17.00. Staff.

120. JOURNAL CLUB. Yr; 1 cr. A meeting is held weekly. Advanced students will be expected to report from time to time upon current papers dealing with pharmacology and toxicology.

200. RESEARCH. The facilities of the laboratory are available to qualified persons. Lab. fee $5.00.

222. SEMINAR IN PHYSIOLOGY, PHARMACOLOGY, AND PHYSIOLOGICAL CHEMISTRY. Yr; 1 cr.

PHYSIOLOGICAL CHEMISTRY

HAROLD CORNELIUS BRADLEY, Ph. D., *Professor of Physiological Chemistry, Chairman*
EDGAR JOHN WITZEMANN, Ph.D., *Assistant Professor of Physiological Chemistry*
HARRY DANIEL BAERNSTEIN, Ph.D., *Instructor in Physiological Chemistry*

104. PHYSIOLOGICAL CHEMISTRY. I; 4 cr. Lectures, conferences, and laboratory work. Required for first year medical students and open to others as an elective. Prerequisites: Chemistry 1 and 20 or 120, Physics 1, Zoology 1. Lab. fee $15.00; deposit $5.00. Dr. Bradley, Dr. Witzemann.

114. PHYSIOLOGICAL CHEMISTRY. I; 3 cr. Lectures, conferences, and laboratory work. Required of juniors in physical education and open to others as an elective. Prerequisites: Chemistry 1, Physics 1, Zoology 1. Lab. fee $7.00; deposit $5.00. Mr. Baernstein.

117. ADVANCED PHYSIOLOGICAL CHEMISTRY AND RESEARCH. II; *cr. Lab. fee $2.50 per cr.; deposit $5.00. Dr. Bradley, Dr. Witzemann.

120. JOURNAL CLUB. Yr; 1 cr. Dr. Bradley.

200. RESEARCH. Lab. fee $5.00.

222. SEMINAR IN PHYSIOLOGY, PHARMACOLOGY, AND PHYSIOLOGICAL CHEMISTRY. Yr; 1 cr.

PHYSIOLOGY

WALTER JOSEPH MEEK, Ph.D., *Professor of Physiology, Chairman*
JOHN AUGUSTINE ENGLISH EYSTER, B.S., M.D., *Professor of Physiology*
PERCY MILLARD DAWSON, B.A., M.D., *Associate Professor of Physiology*
FRANCES ANNE HELLEBRANDT, B.S., M.D., *Assistant Professor of Physiology*
RUTH ELIZABETH BROGDON, B.A., *Instructor in Physiology*
HANCE FRANCES HANEY, M.A., *Instructor in Physiology*
RAYMOND CLYDE HERRIN, Ph.D., *Instructor in Physiology*
FRANK MARESH, M.S., *Instructor in Physiology*
STEVENS JOHN MARTIN, Ph.D., *Instructor in Physiology*

1. ELEMENTS OF HUMAN PHYSIOLOGY. I; 4 cr. Lectures, quizzes, and demonstrations giving a general knowledge of the structure and functions of the human body. Especially adapted to teachers. Students electing this course should have had some chemistry. Lab. fee $3.00. Dr. Meek.

3. ANIMAL PHYSIOLOGY. II; 4 cr. Especially designed for students in agriculture and in physical education for men, but open to others. Lab. fee $3.00. Dr. Meek and staff.

4. PHYSIOLOGY. I; 4 cr. Lab. fee $3.00. Open only to students in the course in nursing.

17. SURVEY OF PHYSIOLOGY: FUNCTIONS OF THE HUMAN BODY. I; 4 cr. Elementary survey course intended for B.A., General Course students. Open to freshmen. Chemistry a desirable prerequisite. Lab. fee $3.00. Dr. Meek.

105. MEDICAL PHYSIOLOGY. I; 2 cr; II; 7 cr. Lectures, recitations, demonstrations, and laboratory. Required of first-year medical students and open to others as an elective. Prerequisites: Anatomy 110, 121 (comparative or human anatomy), 126; Physiological Chemistry 104. Lab. fee $17.00. Dr. Meek, Dr. Eyster.

115. PHYSIOLOGY. I; 5 cr. Lectures, recitations, demonstrations, and laboratory. Required of juniors in physical education for women and open to others as an elective. Prerequisites: Comparative anatomy, physiological chemistry. Lab. fee $13.00. Dr. Hellebrandt.

116. PHYSIOLOGY OF EXERCISE. II; 3 cr. Prerequisite: Physiology 115. Lab. fee $6.00. Dr. Hellebrandt, Miss Brogdon.

117. PROBLEMS IN APPLIED PHYSIOLOGY. II; 2 cr. Prerequisite: Physiology 115, 116. Lab. fee $5.00. Dr. Hellebrandt, Miss Brogdon.

120. JOURNAL CLUB. Yr; 1 cr. Reports of recent physiological and biochemical literature. Dr. Meek.

200. ADVANCED PHYSIOLOGY AND RESEARCH. Yr; *cr. Lab. fee $5.00. Dr. Eyster, Dr. Meek, Dr. Hellebrandt.

222. SEMINAR IN PHYSIOLOGY, PHARMACOLOGY AND PHYSIOLOGICAL CHEMISTRY. Yr; 1 cr.

SURGICAL DIVISION

GENERAL SURGERY

ERWIN RUDOLPH SCHMIDT, B.A., M.D., *Professor of Surgery, Chairman*
JOSEPH WASSON GALE, M.A., M.D., *Associate Professor of Surgery*
RALPH MILTON WATERS, B.A., M.D., *Associate Professor of Surgery*
WILLIAM JOHN FOCKE, B.S., M.D., *Instructor in Surgery*
DAVID NICHOLAS TREWEEK, M.A., M.D., *Instructor in Surgery*
ARTHUR CHANDLER TAYLOR, M.A., M.D., *Instructor in Surgery*

102. SURGICAL CLINICS. II; 1 cr. Prerequisites: Anatomy 121, Pathology 101, I; Physiology 105.

103. ELEMENTS OF SURGERY. II; 1 cr. Prerequisites: Anatomy 121, Pathology 101, I; Bacteriolgy 102, Physiology 105. Dr. Schmidt.

200. ADVANCED WORK AND RESEARCH. Yr; *cr.

301. THIRD-YEAR SURGERY. I, 6 cr; II, 4 cr. Lectures, conferences, ward work, and clinics. Prerequisites: Medicine 110, 111, Surgery 102, 103. Lab. fee $25.00. Dr. Schmidt and staff.

401. FOURTH-YEAR SURGERY. I, II; 3 cr. Prerequisites: Medicine 301, Surgery 301.

OPHTHALMOLOGY

FREDERICK ALLISON DAVIS, M.D., *Professor of Ophthalmology*
EZRA EUGENE NEFF, B.A., M.D., *Associate Professor of Ophthalmology*

200. ADVANCED WORK AND RESEARCH. Yr; *cr. Dr. Davis and staff.

310. THIRD-YEAR OPHTHALMOLOGY. I; 1 cr. Prerequisites: Medicine 110, 111, Surgery 102, 103. Lab. fee $2.50. Dr. Davis and staff.

410. FOURTH-YEAR OPHTHALMOLOGY. I, II; 1 cr. Prerequisites: Surgery 310, 311.

RHINOLOGY AND OTOLARYNGOLOGY

WELLWOOD MACK NESBIT, M.D., *Associate Professor of Otolaryngology*

200. ADVANCED WORK AND RESEARCH. Yr; *cr. Dr. Nesbit and staff.

311. THIRD-YEAR RHINOLOGY AND OTOLARYNGOLOGY. I; 1 cr. Prerequisites: Medicine 110, 111, Surgery 102, 103. Lab. fee $2.50. Dr. Nesbit.

411. FOURTH-YEAR RHINOLOGY AND OTOLARYNGOLOGY. I, II; 2 cr. Prerequisites: Surgery 310, 311.

ORTHOPEDIC AND PLASTIC SURGERY

FREDERICK JULIUS GAENSLEN, B.S., M.D., *Professor of Orthopedic Surgery*
GEORGE VAN INGEN BROWN, M.D., D.D.S., F.A.C.S., *Professor of Oral and Plastic Surgery*
HERMAN SCHUMM, B.S., M.D., F.A.C.S., *Associate Professor of Orthopedic Surgery*
ROBERT EMMETT BURNS, B.S., M.D., *Associate Professor of Orthopedic Surgery*
VOLNEY BUTMAN HYSLOP, M.D., *Instructor in Oral and Plastic Surgery*
CAROL EWART ROACH, B.A., M.D., *Instructor in Medical Orthopedics*
ARTHUR CHANDLER TAYLOR, M.A., M.D., *Instructor in Orthopedic Surgery*
EDWIN FRANK WESTOVER, D.D.S., *Instructor in Dental Surgery*

200. RESEARCH. Yr; *cr.

314. PLASTIC SURGERY. II; 1 cr. Prerequisites: Medicine 301, I; Surgery 301, I.

315. ORTHOPEDICS. II; 1 cr. Prerequisites: Medicine 301, I; Surgery 301, I. Includes five lectures on fractures.

415. ORTHOPEDIC SURGERY. I, II; 1 cr. Prerequisite: Surgery 315.

UROLOGY

IRA ROSCOE SISK, Phar.D., M.D., *Professor of Urology*
JOHN BREWSTER WEAR, B.A. ,M.D., *Assistant Professor of Urology*

200. ADVANCED WORK AND RESEARCH. Yr; * cr.

325. THIRD-YEAR UROLOGY. II; 1 cr. Prerequisites: Medicine 301, I; Surgery 301, I.

425. FOURTH-YEAR UROLOGY. I, II; 2 cr Prerequisite: Surgery 325.

OBSTETRICS AND GYNECOLOGY

JOHN WARTON HARRIS, M.A., M.D., *Professor of Obstetrics and Gynecology, Chairman*
RAPH EMERSON CAMPBELL, B.S., M.D., *Associate Professor of Obstetrics and Gynecology*
CARL SAMUEL HARPER, B.S., M.D., *Clinical Assistant Professor of Obstetrics and Gynecology*
MADELINE JOSEPHINE THORNTON, B.A., M.D., *Instructor in Obstetrics and Gynecology.*

200. ADVANCED WORK AND RESEARCH. Yr; *cr. Lab. fee $5.00.

330. THIRD-YEAR OBSTETRICS AND GYNECOLOGY. Yr; 3 cr. Prerequisites: Medicine 301, I; Surgery 301, I. Lab. fee $5.00. Dr. Harris and staff.

406. FOURTH-YEAR OBSTETRICS AND GYNECOLOGY. I; 2 cr. Prerequisite: Surgery 330.

This course is supplemented by two weeks of clinical instruction in Chicago and two in Milwaukee through the courtesy of the Directors of the Chicago Lying-In Hospital, Dr. J. B. DeLee and Dr. F. L. Adair, and the directors of the Martha Washington Home, Dr. H. W. Shutter and Dr. A. H. Lahmann.

RADIOLOGY AND PHYSICAL THERAPY

ERNEST ALBERT POHLE, M.D., Ph.D., *Professor of Radiology, Chairman*
JAMES CLAUDE ELSOM, M.D., *Professor of Physical Education, Associate Professor of Physical Therapy*
JOE NEWTON SISK, B.S., M.D., *Lecturer in Radiology*
LAWRENCE VICTOR LITTIG, B.S., M.D., *Lecturer in Radiology*
MARTHA ELLEN LEWIS, B.A., *Instructor in Physical Therapy*
LESTER WARNER PAUL, B.S., M.D., *Instructor in Radiology*

200. GRADUATE WORK AND RESEARCH. The facilities of the laboratory are available for carrying out investigations in the field of radiology and physical therapy. Credit toward an M.S. or Ph.D. degree may be obtained by enrolling in the Graduate School and meeting its requirements. Dr. Pohle.

222. SEMINAR IN RADIOLOGY AND PHYSICAL THERAPY. Yr; 1 cr. Dr. Pohle and staff.

316. PHYSICAL THERAPY. II; 1 cr. In this course the fundamentals of mechano-, light-, electro-, and hydro-therapy and their clinical indications are considered. Prerequisites: Medicine 301, I; Surgery 301, I. Dr. Elsom.

320. RADIOGRAPHY AND RADIOTHERAPY. II; 1 cr. Lectures and demonstrations to third-year students. Prerequisites: Medicine 301, I; Surgery 301, I. Lab. fee $5.00. Drs. Pohle, Littig, Paul, and Sisk.

405. APPLIED RADIOLOGY. I, II; 1 cr. Interpretation of roentgenograms, and clinic in X-ray and radium therapy. Prerequisite: Surgery 320. Drs. Pohle, Littig, Paul, and Sisk.

416. APPLIED PHYSICAL THERAPY. I, II; 1 cr. Prerequisite: Surgery 316. Dr. Elsom.

SCHOOL OF NURSING

HELEN I. DENNE, DIRECTOR

ORGANIZATION AND AIMS

The School of Nursing of the University of Wisconsin is organized in association with the Medical School of the University and with the State of Wisconsin General Hospital. The coordinating committee of the school is composed of the Dean of the Medical School, the Superintendent of the Hospital, and the Director of the School, who has charge of the immediate administration. There is close affiliation between the school and other departments of the University, In the field of public health nursing the school has the cooperation of the Bureau of Public Health Nursing of the State Board of Health.

The aims of the school are:

1. To give adequate training in the sympathetic care of the sick.
2. To promote academic education as an aid to professional experience.
3. To stimulate advanced training and research in special fields of work within the realm of nursing.

ADMISSION REQUIREMENTS

For matriculation in the School of Nursing a student must furnish evidence that she has satisfied the general requirements for admission to the University, as stated under Part III, Admission, page 33.

Students desiring to enter either the three-year or a five-year combined course are requested to communicate with the Registrar of the University, and for more specific details regarding these courses with the Director of the School of Nursing, University of Wisconsin.

EXPENSE

During the period of pre-professional training, the minimum for which is one semester, the student is subject to the same conditions as other students in the University and must provide for her room, board, and incidental expenses and pay the usual general and laboratory fees. For the required semester of pre-professional work in the three-year course the laboratory fees amount to $25.00. This makes the total laboratory and other fees for residents of Wisconsin $46.50. The non-resident tuition fee is $100.00 per semester. Board and room cost from $10.00 per week upwards for 16 weeks, making a total expense of about $200, in addition to laundry, clothing, and various incidentals. During the period of resident professional instruction no fees are charged, and room, board, and laundry are furnished the students.

A detailed discussion of student expense, including university charges, loan funds and scholarships, self-support, etc., may be found on page 15.

FIVE-YEAR COMBINED COURSES

Two courses are offered of combined academic and resident professional instruction leading to the degree of Bachelor of Science and certificate of Graduate Nurse in five years.

The College of Letters and Science grants the degree of Bachelor of Science (Hygiene) to students who successfully complete six semesters of work, as outlined below, in the College of Letters and Science, and 27 months of work in the School of Nursing.

The College of Agriculture grants the degree of Bachelor of Science (Home Economics) to students who successfully complete six semesters of work, as outlined below, in Courses in Home Economics, and 27 months of work in the School of Nursing.

RESIDENT PROFESSIONAL INSTRUCTION

The resident professional instruction consists of 27 months in residence in the Nurses' Dormitory. During this period the student has instruction in medicine, surgery, and principles of nursing, ward practice in the wards and outpatient departments of the hospital, and practical training in public health nursing. The resident instruction is divided into four half years of academic and professional education and three additional months of special training. In each half year there are one semester of four months of academic and ward work, six weeks (52 hours per week) of ward or field work, and two weeks of vacation. The semester work is given as outlined above under the three-year course, excepting that physical education is not required.

COMBINED COURSE, COLLEGE OF LETTERS AND SCIENCE

This course leads to the degree of Bachelor of Science (Hygiene). The following specific requirements must be satisfactorily met:

ENGLISH. 10 credits as follows: 6 credits in composition, 3 credits per semester for two semesters, to be taken in the first year of residence; 4 credits in literature, to be taken normally in the sophomore year. Students securing a grade of A in the first semester of composition may, if they so desire, omit the second semester of it.

FOREIGN LANGUAGE. Two years of either French or German in college if students do not meet the foreign-language requirement for the B.A. degree. (See page 64).

HISTORY. 6 credits in a continuous year course; or mathematics, 8 credits.

SCIENCE. Chemistry 1, 10 credits; Physiology 4, 4 credits; Nursing 1, 2 credits; Bacteriology 4, 2 credits.

ECONOMICS, SOCIOLOGY, AND PSYCHOLOGY. 16 credits, including Economics 1a, Sociology 1, 2, and 141, and Psychology 1; or 16 credits of science in addition to Chemistry 1, including biology, 10 credits, and organic chemistry, 4 credits.

ELECTIVES. A sufficient number of electives must be taken to bring the total amount of work in the College of Letters and Science up to 94 credits and 94 grade-points, including major study and thesis.

MAJOR STUDY. By the beginning of the junior year every candidate should be well started in her major study which must be chosen from the majors offered in the College of Letters and Science, including majors in the medical sciences. This major may include a thesis, to be prepared during the final years of the combined course.

CREDITS. A total of 127 credits and 127 grade-points, including 94 required by the College of Letters and Science and 33 earned during the required 27 months of resident professional instruction.

SEQUENCE OF SUBJECTS

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Chem. 1a—General chemistry	5	Chem. 1b—General chemistry	5
History or mathematics	3-4	History or mathematics	3-4
French or German	3-4	French or German	3-4
Physical education	0	Physical education	0
	14-16		14-16

SOPHOMORE YEAR

Engl. 33a—English literature	2	Engl. 33b—English literature	2
French or German	3-4	French or German	3-4
Optional subjects	8-11	Optional subjects	8-11
Biology 1—5 cr.		Biology 1—5 cr.	
Chemistry 20, 21, or 120, 121, 3-4 cr.		Chemistry 120, 121 3-5 cr.	
Economics 1a—4 cr.		Economics 1a—4 cr.	
Psychology 1—3 cr.		Sociology 2—3 cr.	
Sociology 1—3 cr.		Psychology 1—3 cr.	
Physical education	0	Physical education	0
	14-16		14-16

JUNIOR YEAR

Physiology 4	4	Electives	15
Bacteriology 4	2		
Nursing 1	2		
Optional subjects	3-6		
Sociology 141—3 cr.			
Free option—3 cr.			
Electives	1-4		
	15		15

COMBINED COURSE, DEPARTMENT OF HOME ECONOMICS

This course leads to the degree of Bachelor of Science (Home Economics). The following specific requirements must be satisfactorily met:

Completion of the required work of the freshman and sophomore years of the Course in Home Economics, as outlined on page 280.

Completion of the following additional courses: Home Economics 7 and 17, 47, 6 and 16, 22, 133; English 33b; Anatomy 120 or Physiology 4; and Nursing 1.

Thesis, 4 credits.

Electives sufficient to bring the total credits of work required by the Department of Home Economics up to 94, including thesis.

Twenty-seven months of resident professional instruction in nursing.

A total of 127 credits and 127 grade-points, including 94 required by the Department of Home Economics and 33 earned during the period of resident professional instruction.

THREE-YEAR COURSE

LEADING TO THE TITLE OF GRADUATE NURSE

Upon the completion of at least one semester of academic college work, including the special subjects outlined below and 32 months of professional training in residence in the School of Nursing, a certificate of Graduate Nurse will be granted.

PRE-HOSPITAL SEMESTER

Candidates for the certificate of Graduate Nurse who have had no college work or whose college work has not included work in chemistry and physiology are required to take the following special pre-hospital academic work before being admitted to residence in the School of Nursing. This work is offered the first semester of each year.

	Credits
English 1a—Freshman composition	3
Chemistry 1a—General chemistry	5
Physiology 4—Physiology for nurses	4
Bacteriology 4—Bacteriology for nurses	2
Nursing 1—Principles of nursing	2
Physical education	0
	16

RESIDENT PROFESSIONAL INSTRUCTION

This course consists of 32 months in residence in the Nurses' Dormitory. During this period the student has instruction in medicine, surgery, and principles of nursing, ward practice in the wards and out-patient departments of the hospital, and practical training in public health nursing. The resident instruction is divided into five half years of academic and professional education and two additional months of special training. In each half year there are one semester of four months of academic and ward work, six weeks (52 hours per week) of ward or field work, and two weeks of vacation. The semester work is arranged in the following sequence:

FIRST SEMESTER

	Credits
Therapeutics 1—Materia medica	3
Dietetics 1—Selection, preparation, and serving of food for the sick	2
Med. and Surg. 1—Recognition and treatment of disease	3
Nursing 2—Elementary principles of nursing	2
Ward work—6 hours daily	
Physical education	

SECOND SEMESTER

Med. and Surg. 2—Health, disease, and therapy in infancy and childhood	4
Med. and Surg. 5—Communicable diseases; Physical therapy	2
Nursing 3—Care of infants and children	2
Psychology 1—Introductory psychology	3
Ward work—6 hours daily	

THIRD SEMESTER

Med. and Surg. 3—Nervous and mental health, disease, and therapy	3
Med. and Surg. 4—Health, disease, and therapy of the eye, ear, nose, mouth, throat, and skin	2
Sociology 2	3
Nursing 4—Special technique	2
Ward work—6 hours daily	

FOURTH SEMESTER

Med. and Surg. 6—Obstetrics and gynecology	2
Med. and Surg. 7—Medicine and urogenital surgery	2
Nursing 5—Social problems from the standpoint of nursing and dietetics	4
Education 47—Psychology of learning and teaching	3
Ward work—6 hours daily	

DEPARTMENTS OF INSTRUCTION

For a description of the courses in botany, zoology, chemistry, physics, psychology, history, economics, sociology, English, and the foreign languages, see departmental announcements in the College of Letters and Science. For home economics see departmental announcements of the College of Agriculture. For the medical sciences, anatomy, physiology, bacteriology, hygiene, pharmacology and toxicology, see departmental announcements of the Medical School.

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
I, II—semester course given each semester
cr—number of credit hours per semester

DIETETICS

HELEN BROWN GIESSEL, B.S., *Assistant Professor of Dietetics*
LENORE HEALEY HUBLY, B.S., *Assistant in Dietetics*

1. SELECTION, PREPARATION, AND SERVING OF FOOD FOR THE SICK. I, II; 2 cr.

2. ADVANCED DIETETICS. I; 1 cr. Prerequisite: Dietetics 1.

MEDICINE AND SURGERY

GEORGE VAN INGEN BROWN, M.D., D.D.S., F.A.C.S., *Professor of Oral and Plastic Surgery*
JOHN WARTON HARRIS, M.D., *Professor of Obstetrics and Gynecology*
WILLIAM DAVISON STOVALL, M.D., *Professor of Hygiene*
ROBERT EMMETT BURNS, B.S., M.D., *Associate Professor of Orthopedic Surgery*
RALPH EMERSON CAMPBELL, B.S., M.D., *Associate Professor of Obstetrics and Gynecology*
JAMES CLAUDE ELSOM, M.D., *Associate Professor of Physical Therapy*
JOHN WASSON GALE, M.A., M.D., *Associate Professor of Surgery*
JOHN EUGENE CONCE, JR., B.A., M.D., *Associate Professor of Pediatrics*
WILLIAM SHAINLINE MIDDLETON, M.D., *Associate Professor of Medicine*
EZRA EUGENE NEFF, B.A., M.D., *Associate Professor of Ophthalmology*
WELLWOOD MACK NESBIT, M.D., *Associate Professor of Otolaryngology*
RALPH MILTON WATERS, M.D., *Associate Professor of Surgery in charge of Anaesthesia*
ROSCOE LYLE MCINTOSH, B.S., M.D., *Assistant Professor of Dermatology*
MABEL GARDEN MASTEN, B.S., M.D., *Assistant Professor of Neuropsychiatry*
JOHN BREWSTER WEAR, B.A., M.D., *Assistant Professor of Urology*

1. RECOGNITION AND TREATMENT OF DISEASE. II; 3 cr

1. HEALTH, DISEASE, AND THERAPY IN INFANCY AND CHILDHOOD. I; 4 cr. Includes pediatrics, orthopedics, and operating room technique.

3. NERVOUS AND MENTAL HEALTH, DISEASE, AND THERAPY. II; 3 cr. This course includes the principles of mental hygiene.

4. HEALTH, DISEASE, AND THERAPY OF THE EYE, EAR NOSE, MOUTH, THOART, AND SKIN. II; 2 cr.

5. SPECIAL THERAPEUTIC TECHNIQUE. I; 2 cr. Physical therapy and communicable diseases.

6. OBSTERICS AND GYNECOLOGY. I; 2 cr.

7. MEDICINE AND UROGENITAL SURGERY. I; 2 cr.

NURSING

Helen I. Denne, B.A., R.N., *Professor of Nursing*
Lila B. Fletcher, R.N., *Associate Professor of Nursing*
Grace Jean Kellock, B.S., R.N., *Assistant Professor of Nursing*
Marion L. Zilley, B.A., R.N., *Assistant Professor of Nursing*
Alice Eileen Batten, B.S., R.N., *Instructor in Social Work*
Maxine M. Baumgartner, B.S., R.N., *Instructor in Nursing*
Helen Bakken, R.N., *Instructor in Nursing of Diseases of Eye, Ear, Nose, Throat*
Helen Lathrop Bunge, B.A., R.N., *Instructor in Nursing*
Frances Campbell, R.N., *Instructor in Nursing*
Gladys Carey, R.N., *Instructor in Nursing of Communicable Diseases*
Eva Bewick Clifford, R.N., *Instructor in Orthopedic Nursing*
Florence Fiedler, R.N., *Instructor in Neuropsychiatric Nursing*
Sidonia Heck, B.S., R.N., *Instructor in Surgical Nursing*
Astrid R. Olsen, R.N., *Instructor in Nursing*
Flora Schrankel, R.N., *Instructor in Operating Room Technique*
Frances Stuart, *Instructor in Occupational Therapy*
Frances H. Taylor, B.S., R.N., *Instructor in Pediatric Nursing*
Helen Bennett Wheeler, B.A.Sc., R.N., *Instructor in Obstetrical Nursing*
Helen Rothlisberger, R.N., *Assistant in Medical Nursing*
Rose H. Stillman, B.A., R.N., *Assistant in Obstetrical Nursing*
Theresa Stolen, B.S., R.N., *Assistant in Nursing of Communicable Diseases*
Hattie B. Trauba, B.S., R.N., *Assistant in Orthopedic Nursing*
Bessie Walhus, R.N., *Assistant in Surgical Nursing.*

1. Elementary Principles of Nursing. I; 2 cr.

2. Elementary Principles of Nursing. I, II; 2 cr. Continuation of Nursing 1 which is prerequisite.

3. Care of Infants and Children. I; 2 cr. Prerequisites: Nursing 1 and 2.

4. Special Technique. II; 2 cr. Prerequisites: Nursing 1, 2, 3.

5. Social Problems from the Standpoint of Nursing. I; 4 cr. Prerequisites: Nursing 1, 2, 3.

THERAPEUTICS

Arthur Lawrie Tatum, Ph.D., M.D., *Professor of Pharmacology*
Ernest Kuenzi, B.S., *Pharmacist*

1. Materia Medica. II; 3 cr. The recognition, use, and danger of drugs used in medicine.

SCHOOL OF EDUCATION

C. J. Anderson, Dean

In April, 1930, the Regents of the University approved the action of the University Faculty establishing a School of Education of college rank, and gave to it jurisdiction over the undergraduate preparation of teachers. The establishment of this coordinate school is the fourth step taken by the University of Wisconsin in the development of the training of teachers. Prior to 1908, the Department of Education offered certain courses for those preparing to teach. In 1908 the Course for the Training of Teachers was established. This was superseded in June, 1919, by a School of Education administered within the College of Letters and Science, and this, in turn has been succeeded by the present School of Education.

The faculty of the School of Education is made up of the faculties of the Departments of Education, Art Education, and Physical Education for Men and for Women, those faculty members offering courses in educational methods, and those members of the faculties of the departments in the College of Letters and Science and of Agriculture who offer courses of junior and senior grade in the following teaching majors: agriculture, botany, chemistry, commerce, economics, English, French, geography, German, history, home economics, Italian, journalism, Latin, library science, mathematics, music, physics, physiology, Spanish, speech, zoology.

The School of Education provides professional preparation for teachers of academic high-school subjects; teachers of art, agriculture, home economics, physical education; play-ground and recreation supervisors; high-school librarians; principals, supervisors, and superintendents.

The preparation noted above rests upon a basis of a sound general education and includes: (1) a teaching major and minor in the academic or special fields; (2) professional training including courses dealing with the principles, psychology, and the practice of teaching, closely correlated with actual participation in the Wisconsin High School. Graduate courses in the various fields of education, including opportunity for research, are offered for those who recognize the desirability of study beyond the four years of college work, and who are preparing to become teachers in public schools, teachers' colleges, colleges, and universities, as well as supervisors and administrators.

ADMISSION AND REGISTRATION

1. Students electing a major in Art Education or in Physical Education will register in the School of Education at the beginning of the freshman year.
2. Students electing a teaching major in an academic field are eligible for transfer to the School of Education when they have satisfactorily completed the regular requirements of the first two years of one of the General Courses in the College of Letters and Science. (See Section 18, paragraph (a), Bulletin of the College of Letters and Science.) However, no student will be accepted into the School of Education unless his scholastic record is sufficiently high to indicate the probability of success in some teaching field. Applicants for transfer are also required to present evidence of proficiency in speech in the form of either (a) a rating by the Speech Examination Committee of the School of Education, or

(b) a grade in Speech 1 (Fundamentals of speech). Students are advised to adapt the requirements of the first two years of one of the General Courses to the requirements for graduation from the School of Education, in order to obviate the necessity of spending more than four years in earning the B.S. (Education) degree. Any one of the four special sequences listed below will serve to accomplish this purpose; numbers I and III fulfill the Ph.B. requirements and numbers II and IV the B.A. requirements. Before transfer to the School of Education can be approved, substantial progress toward the completion of the general requirements and the selected pre-education sequence must be made.

3. Students in special courses (College of Letters and Science) having a complete two-year or four-year curriculum, such as the Course in Chemistry, the Course in Humanities, and the Schools of Commerce, Journalism, and Music, will retain their classifications in the College of Letters and Science, but must also register in the School of Education in order to receive the University Teachers' Certificate.
4. Students electing a teaching major in agriculture or in home economics must register concurrently in the College of Agriculture and in the School of Education at the beginning of the junior year.

PRE-EDUCATION SEQUENCES

Students who expect to transfer to the School of Education should select one of the following sequences:

SEQUENCE I

A. No foreign language required.

B. Required: English composition, 10 cr. (English 1 and 2); history 10 cr.†; social sciences, 6 cr.‡; mathematics or philosophy, 10 cr.; natural science, 20 cr.* in regular year courses.

SEQUENCE II

A. Required: Intermediate knowledge of one language.

B. Required: English literature, 4-6 cr.; English composition, 6 cr.; history, 6 cr.†; social sciences, 6 cr.‡; mathematics, 8 cr. or philosophy, 6 cr.; natural science, 10 cr.* in elementary survey courses or 15 cr.* in regular year courses.

SEQUENCE III

A. Required: Intermediate knowledge of one language.

B. No English literature required. Required: English composition, 6 cr.; history, 6 or 10 cr.†; social sciences, 6 cr.‡; mathematics 10 or 8 cr. or philosophy 10 or 6 cr.; natural science, 20 cr.* in regular year courses.

SEQUENCE IV

A. Required: Proficiency in one foreign language, or intermediate knowledge in two foreign languages, or intermediate knowledge in one foreign language plus 10 cr. in literature courses in that language.

B. Required: English composition, 6 cr.; English literature, 4-6 cr.; two of the following: (a) history, 6 cr.† and social sciences, 6 cr.‡; (b) mathematics, 8 cr.; (c) natural sciences, 10 cr.* in elementary survey courses or 15 cr.* in regular year courses.

*Must include 5 cr. in biology, preferably zoology, and 5 cr. in a non-biological science.
†Must include a year course in European or American history.
‡Must include Political Science 1 or 7 (3 cr.) and economics or sociology (3 cr.).

DEGREES

The School of Education grants, upon the successful completion of the various courses, the following degrees: Bachelor of Science (Education), Bachelor of Science (Art Education), Bachelor of Science (Physical Education), and, jointly with the College of Agriculture, Bachelor of Science (Agriculture and Education) and Bachelor of Science (Home Economics and Education).

Only students qualifying for degrees in the School of Education may receive the University Teachers' Certificate and the recommendation of the School of Education, with the exception of those in the special courses noted in 3 above.

SUPERVISORY SERVICE BUREAU

A supervisory service bureau has been established for the purpose of assisting graduates of the University of Wisconsin who are teaching in the State to make the transition from university work to classroom teaching. The functions of the bureau are: (1) to provide information dealing with the problems of the first two years of teaching; (2) to visit, on call, teachers who have been graduated from the University of Wisconsin and who are within their first two years of service; (3) to issue bulletins dealing with the problems of teaching; and (4) to study continuously the training of teachers in service, the difficulties of beginning teachers, their improvability, means of improvement, etc.

BUREAU OF EDUCATIONAL RESEARCH

A bureau of educational research has been established for the purpose of coordinating and facilitating research in education with particular reference to the public schools of the State. The facilities of the bureau are available for use by graduate students majoring in education and in allied departments and by superintendents, principals, and teachers throughout the State. Bulletins and studies, reporting the results of investigations, are issued from time to time. The work of the bureau is in charge of a committee consisting of members of the faculty of the Department of Education.

WISCONSIN HIGH SCHOOL

The Wisconsin High School, a six-year secondary school opened in September, 1911, is maintained by the University as an integral part of the School of Education. The primary purposes of this school are (a) the exemplification of sound educational theory and organization, with special reference to secondary education, and (b) the provision of appropriate facilities for observation and directed teaching. The details of organization, program of studies, etc., will be found in the bulletin of the Wisconsin High School.

REQUIREMENTS FOR GRADUATION

Graduation from the School of Education and recommendation for the University Teachers' Certificate in academic subjects are based upon the following conditions and requirements:

I. A total of 124 credits and 124 grade-points.

II. The satisfactory fulfillment of the requirements of preparation for teaching one of the following:

(a) a major subject and one minor subject; or

(b) a major subject and two minor subjects.

To fulfill the requirements of preparation for teaching the selected major, a student must present credits in amount and kind as prescribed for a teaching major by the department of such major subject. This departmental prescription must in all cases include at least twenty credits, and, in addition, credit for the departmental teachers' course. (See Academic teaching majors and minors, pages 5-13.) As soon as it is practical the completion of a major shall be conditioned upon the passing of a comprehensive examination on the work of such a major.

To fulfill the requirements of preparation for the teaching of the selected minor subject or subjects, a student must present credits in amount and kind as prescribed by the department of such minor subjects. This departmental prescription must contain fifteen credits, exclusive of the departmental teachers' course. (See Academic teaching majors and minors, pages 5-13.)

III. The fulfilling of the course requirements for either the B.A. or the Ph.B. degree as at present constituted respectively for students graduating before 1934 and after, except that intermediate knowledge of one foreign language will be accepted in place of the foreign language requirements for the B.A. degree.

IV. The fulfilling of three of the following four group requirements insofar as they are not met under III above:

1. Twelve credits in history and the social studies, as follows: six credits in a year course in European or American history, and six credits made up of three in political science (Pol. Sci. 1 or 7) and three in economics or sociology. (12 credits)

2. Five credits in the biological sciences, zoology being strongly recommended, and five credits in a physical (non-biological) science. (10 credits)

3. Six credits in introductory philosophy (Phil. 21) and logic (Phil. 11) or eight credits in mathematics. (6 or 8 credits)

4. (a) Ten credits in the literature of a foreign language; or
   (b) The passing of a proficiency test in one language; or
   (c) Intermediate knowledge of a second language.

V. Applicants for registration in the School of Education shall present evidence concerning their speech proficiency in the form of either (a) a rating by the Speech Examination Committee of the School of Education, or (b) a grade in Speech 1.

VI. The recommendation of the departments of the major and minor subjects as to fitness for teaching.

VII. The presentation of a certificate of physical health and fitness from the University Medical Examiner.

VIII. The completion of the following professional requirements:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75—Psychology and practice of teaching	5
A course in the teaching of the major subject	3 or 4
Electives in the Department of Education	4 or 3
	15

IX. Graduates of the professional courses in the state teachers' colleges who register in the School of Education as candidates for the University Teachers' Certificate must present a minimum of six credits in advanced university courses in education, together with a course in the teaching of their major. Under exceptional circumstances another course may be substituted for the course in the teaching of the major subject.

For information concerning the graduation requirements in the four-year courses in Art Education and Physical Education see pages 14-23.

The requirements for graduation in Agriculture and Education and Home Economics and Education are given on pages 24-25.

ACADEMIC TEACHING MAJORS AND MINORS

Only such departments and courses of instruction are here indicated as are immediately related to the professional work of the School of Education.

BOTANY

EDWARD MARTINIUS GILBERT, *Ph.D.*, Professor of Botany and Plant Pathology, *Chairman*

Students preparing to teach botany, either as a major or a minor subject, are advised to elect courses in both structural and physiological botany, and also those that involve field work.

MAJOR. A minimum of 30 credits from the following courses: Zoology 1; Botany 1, 2, 103, 104, 107, 108, 110, 112, 113, 117, 118, 129, 130, 131, 146, 147, 150, 154,156, 160.

MINOR. A minimum of 15 credits from the following courses: Botany 1, 2, 103, 104, 107, 108, 110, 112, 113, 129, 130, 131, 146, 160. Attention is called to courses 1 and 2, which together constitute a year's work and which are especially adapted to the needs of those taking a teachers' minor in botany.

Educational Methods 71. The Teaching of Biology. I, II; 3 cr. Miss Weber.

CHEMISTRY

JOSEPH HOWARD MATHEWS, *Ph.D.*, Professor of Chemistry, *Chairman*

REQUIREMENTS FOR MAJOR

Course No.	Title of Course	OPTIONAL FIELDS OF CONCENTRATION				
		Organic	Physical	Food	Inorganic	Premedical
1	General chemistry and qualitative analysis	8-10 cr.	8-10 cr.	8-10 cr.	8-10 cr.	8-10 cr.
10	Mathematical chemistry*	3	3	3	3	3
11	Quantitative analysis	8	8	8	10	6
120	Organic—lectures	4	4	4	4	4
121	Organic—laboratory	6	4	4	3	4
130	Physical—lectures	4	4	4	4	4
131	Physical—laboratory	3	6	3	4	2
100	Thesis	6	6	6	6	6
123	Characterization of organic compounds	3	--	--	--	--
146–7	Food chemistry	--	--	5	--	--
104,117	Physiological chemistry	--	--	--	--	8
	Adv. technical elective	--	--	--	2	--
	Total Credits	45–47	43–45	45–47	44–46	45–47

*Need not be taken by those who have completed Math. 5a or 54.

MINOR. A minimum of fifteen credits.

Educational Methods 72. The Teaching of Chemistry. II; 2 or 3 cr. Prerequisites: Chemistry 1; first semester of Chemistry 120, or credit or enrollment for five credits in Chemistry 11. Mr. Walton.

COMMERCE

CHESTER LLOYD JONES, *Ph.D.*, Professor of Economics and Political Science, *Director*

The School of Commerce affords certain facilities for those students who wish to prepare themselves to teach commercial subjects in secondary schools. Such students are advised to consult with the Director of the School of Commerce in the arrangement of elective work.

Educational Methods 75. The Teaching of Bookkeeping. II; 3 cr. Prerequisites: Senior standing and Economics 8b. Practice teaching in bookkeeping is not offered in the Wisconsin High School; however, those who elect this course are required to do participation-teaching in another subject. Miss Hensey.

COMPARATIVE LITERATURE

PHILO MELVIN BUCK, JR., *M.A.*, Professor of Comparative Literature, *Chairman*

MAJOR. 30 credits of which 16 shall be in Comparative Literature, including courses 9 and 165. The other 14 must be in advanced literature courses in two languages, one of which may be English. No courses below the following are accepted: Latin 6, Greek 10 or 7, English 34, French 21, German 20, Spanish 21, Italian 20. It is strongly urged that at least 12 credits be added in two of the departments—Art History, Philosophy, History.

A teachers' course in Comparative Literature is not offered. Educational Methods 76 (the teaching of English) is accepted in lieu thereof.

ECONOMICS

HARRY JEROME, *Ph.D.*, Professor of Economics, *Chairman*

MAJOR. A minimum of 30 selected credits.

MINOR. Economics 1a and 1b (8 credits), Educational Methods 84, plus an elective in economics, to make a total of 15 credits.

No regular course in the teaching of economics is offered but a teachers' course in a related subject, such as history, will be accepted.

EDUCATION

For general information concerning the equipment and the courses offered in education, see pages 29-35. For detailed information relative to the special requirements of courses in education for the University Teachers' Certificate, see page 4.

ENGLISH

ROBERT ELKIN NEIL DODGE, *M.A.*, Professor of English, *Chairman*

MAJOR. A minimum of 34 credits, including freshman English. I. One course, and only one, from each of the following groups: (a) 29, 30, 33; (b) 37, 136, 137. II. Two courses from the following group, one of which must be either 31 or 57: 31, 57, 63, 161, 162. III. Not more than two courses from the following group; one will suffice: 34, 35, 40. IV. 123. V. Thesis.

MINOR. I. One course, and only one, from the following group: 29, 30, 33. II. One semester from the composition courses of the following group: 2b, 5, 6, 8. III. 123. IV. One of the following groups: (a) 34 and 35; (b) one, and only one, among 37, 136, 137; (c) both semesters of 40. V. Educational Methods 76.

Educational Methods 76. The Teaching of English II; 3-4 cr. Prerequisites: English 123, senior standing, and satisfactory grade in a qualifying examination covering (1) the elements of grammar, (2) the detection and correction of deviations from standard English, and (3) the English works commonly studied in high schools. This examination is given in the second semester of the junior year. 3 cr. for the minor; 4 cr., including one credit for participation-teaching, for the major. Mr. Pooley.

All students desiring the departmental recommendation to teach English must pass the qualifying examination referred to above.

FRENCH AND ITALIAN

HUGH ALLISON SMITH, *M.A.*, Professor of French, *Chairman*

Students who specialize in French or Italian are advised to elect related courses in history, art, other languages and literatures, and philosophy. Those who expect to continue for advanced degrees should note that knowledge of another foreign language is required for the M.A., and that for satisfoctory work in Romance philology some knowledge of Latin is indispensable. Both Latin and German as well as another Romance language are required for the Ph.D., and should be acquired as early as possible.

Educational Methods 81. The Teaching of French. I, II; 3 cr. Miss Johnson.

FRENCH

MAJOR. Candidates for the University Teachers' Certificate with a major in French must have a proficiency involving comprehension of classical and modern French authors, reasonable ability to understand and speak French, and some knowledge of the history of French literature and culture. They must offer the regular requirements for the major (28 credits in advance of 1b), including or adding the following specific training:

(a) 4 credits of composition and conversation (16, 124, or 127), with grade of *B*, or equivalent training;

(b) 2 credits of phonetics (190);

(c) 3 credits in educational methods (81);

(d) 6 credits in courses of literature or civilization in the 100-group. (This requirement will go into effect for seniors graduating in 1932.);

(e) 4 credits of thesis or thesis substitute.

MINOR. 18 credits in advance of 1b. Required courses are: 2 credits in composition and conversation, and French 21, or 3 credits in a more advanced course in French literature. Minor students are advised (although not required) to take phonetics, and if not majoring in a language, to include Educational Methods 81.

French 13 does not count toward the requirement for major or minor.

ITALIAN

MAJOR. (a) 24 credits in advance of 1b, including 4 credits in composition and conversation with an average grade of *B*. (b) Educational Methods 81, 3 credits.

MINOR. 18 credits in advance of 1b, including 2 credits in composition and conversation.

GENERAL SCIENCE

MINOR. 15 credits in science, 5 of which must be in physics, 5 in chemistry, and 5 in biology, in addition to Educational Methods 97.

Educational Methods 97. The Teaching of Science. I, II; 3-4 cr. Prerequisites: Education 31 and 75. Mr. Davis.

GEOGRAPHY

VERNOR CLIFFORD FINCH, *Ph.D.*, Professor of Geography, *Chairman*

MAJOR. A minimum of 30 credits as prescribed by the Department of Geography, including Educational Methods 82.

MINOR. A minimum of 15 credits made up of 10 credits in courses 1 and 2, 3 credits in Educational Methods 82, and one other course, either regional or topical.

Educational Methods 82. The Teaching of Geography. II; 3 cr. Prerequisite: Geography 1-2 or 5-6. Mr. Whitaker.

GERMAN

BAYARD QUINCY MORGAN, *Ph.D.*, Professor of German, *Chairman*

MAJOR. A minimum of 24 credits in advance of course 2b. In addition to the thesis, or thesis substitute, these credits must include courses 10 or 112, 191, 131 (at least for four credits), 150, 151, and Educational Methods 83.

MINOR. A minimum of course 10, at least 8 credits in literature from courses beyond 2b, including 4 credits from courses in Group B (22, 24, 25, 27, 31), and Educational Methods 83, i.e., at least 14 credits beyond course 2b.

Students who are preparing to teach German as their major or minor subject and who have done a considerable amount of work elsewhere, or who have had successful teaching experience, may be excused, by action of the department, from some of the required work. Such excuse will generally be granted only on the basis of an examination, and in no case will students be recommended by the department unless they have taken at least 4 credits in German at Wisconsin.

Educational Methods 83. The Teaching of German. I; 3 cr. For seniors and graduates. Special permission is necessary for graduate credit. Mr. Griebsch.

HISTORY

CARL RUSSELL FISH, *Ph.D.*, Professor of History, *Chairman*

MAJOR. Not less than 32 nor more than 40 credits in history to include: History 2 (6-4 cr.); one other introductory course (History 1, 5, 10, or 29 for 4-6 cr.); History 4 (6 cr.); at least a semester course, either elementary or advanced, in each of the fields of ancient and medieval history, counting History 5a as medieval history; Educational Methods 84; at least 16 credits in advanced history courses taken at the University of Wisconsin, of which 2 in each semester of the senior year may, in the judgment of the adviser, be assigned to the preparation of a thesis. Outside the department, Economics 1a and Political Science 1 or 7 are required, and Sociology 110 (Pre-history) and Geography 1-2 are strongly recommended.

MINOR. Educational Methods 84 and a minimum of 16 credits in history, including at least 4 credits in advanced courses at the University of Wisconsin.

Educational Methods 84. The Teaching of History and the Social Studies. I, II; 3-4 cr. Mr. Phillips.

JOURNALISM

WILLARD GROSVENOR BLEYER, *Ph.D.*, Professor of Journalism, *Chairman*

MAJOR. A minimum of thirty credits, including the usual studies of the School of Journalism. Students combining a minor in English with this major are not required to take advanced courses in English composition, English 2, 5, or 6.

MINOR. A minimum of 15 credits, including at least the first semester of courses 2 and 3.

LATIN

ARUTHER GORDON LAIRD, *Ph.D.*, Professor of Greek, *Chairman*

MAJOR. A minimum of 31 credits, consisting normally of Latin 6, 7, 101, 102; 10 credits in reading courses of the 100-group; and Educational Methods 90. Those who write a thesis are required to take only 6 credits in reading courses of the 100-group.

MINOR. A minimum of 19 credits, consisting normally of Latin 6, 7, 101, and Educational Methods 90 (or 3 credits of advanced reading if majoring in a foreign language).

Educational Methods 90. The Teaching of Latin. I, II; 3 cr. Miss Guyles.

LIBRARY SCIENCE

MARY EMOGENE HAZELTINE, *B.S.*, Associate Professor of Bibliography, *Principal*

The Library School offers the following course for those who are qualifying for positions as high-school librarians:

LIBRARY SCIENCE FOR TEACHERS. Yr; 2 cr. The object of the course is to qualify those taking it to assume, in connection with their teaching, the supervision of high-school libraries, and to give instruction to high-school students in the use of books and libraries and in the means and methods of developing good habits and right tastes in reading. This course does does not qualify for full-time school library positions, but is for teacher-librarians as required by the Wisconsin Statutes. Open to seniors and graduate students, and to juniors by special permission. Miss Hazeltine, Miss King.

MATHEMATICS

MARK HOYT INGRAHAM, *Ph.D.*, Professor of Mathematics, *Chairman*

MAJOR. (a) A minimum of 21 credits, which shall consist of Courses 5 (or 54 and 55); 6; at least one of 102, 112, 113; and other courses in mathematics numbered 91 or above, excepting 136. Sudents majoring in this department must earn at least as many grade-points as credits in all work included in the major. Eligibility to write a thesis is based on a minimum of 9 credits in mathematics taken at the University of Wisconsin and is determined by the average number of grade-points per credit earned in the courses included in the major. Those whose average thus computed is at least 2.5 will write theses; those whose

average is less than 2.0 are not permitted to write theses; those with intermediate averages are subject to individual rulings by the department, with consideration given to the student's record and wishes. Students entering the junior class with advanced standing who expect to complete a major in mathematics in four semesters should previously have completed the equivalent of Mathematics 5. (b) Educational Methods 93; (c) a knowledge of solid geometry acquired in the secondary school or elsewhere; (d) Mathematics 91 (not required) is recommended as a desirable course for teaching majors.

MINOR. A minimum of 15 credits, including course 5a or 54, and excluding courses 7, 24, 136, and 137. It is understood that at least 6 of these credits shall be earned in residence at the University of Wisconsin with a grade not lower than B. In addition, Educational Methods 93 is required. A knowledge of solid geometry, acquired in college or elsewhere, is expected.

Educational Methods 93. The Teaching of Mathematics. I; 3 cr. Mr. Hart.

MUSIC

CHARLES HENRY MILLS, *Mus.D., F.R.C.O.*, Professor of Music, *Chairman*

The School of Music offers a four-year course leading to the degree of Bachelor of Music; see special bulletin for detailed requirements. The following credits are required for the University Teachers' Certificate:

	Credits
Educ. 75—Psychology and practice of teaching	5
Educ. 31—Principles of secondary education	3
Music 36, 37, 51, or 92 (to be determined by the major field)	4
Elective in the Department of Education	3
	15

PHYSICAL EDUCATION

(See pages 367-372.)

PHYSICS

CHARLES ELWOOD MENDENHALL, *Ph.D.*, Professor of Physics, *Chairman*

MAJOR. A minimum of 29 credits which shall include the following courses: 1 or 31 or 51-52, 2, 3, 4a, 10, 100, and Educational Methods 96. The remaining credits are to be selected from 4b, 7, 106, 115, 116, 117, 118, 124.

MINOR. A minimum of 15 credits selected from the courses listed for a major, and Educational Methods 96.

Educational Methods 96. The Teaching of Physics. II; 3 cr. Mr. Steve.

PHYSIOGRAPHY

(See Geography, page 357.)

PHYSIOLOGY

WALTER JOSEPH MEEK, *Ph.D.*, Professor of Physiology, *Chairman*

MAJOR. A minimum of 23 credits as follows: 3 credits in physiological chemistry; 6 credits in anatomy or zoology as approved by the Department of Physiology; 11 credits in physiology, including thesis; 3 credits in any department of the Medical School, as approved by the Department of Physiology.

In order to fulfill these requirements, Physics 1 or 31, Chemistry 1, and Zoology 1 should be completed before the beginning of the junior year.

MINOR. A minimum of 11 credits in the following courses: Physiology 1, 4 cr; Pathology 5, 2 cr; either Agricultural Bacteriology 1 or 4, 5 cr. General chemistry is strongly advised as a prerequisite to physiology and bacteriology.

SPANISH AND PORTUGUESE

JOAQUIN ORTEGA, *M.A.*, Professor of Spanish, *Chairman*

MAJOR. 27 credits in advance of 1b, including thesis (or 4-6 credits in literature courses numbered above 100 for students not required to write a thesis). The required courses are: 3 credits in Educational Methods 81, 2 credits in phonetics with a grade of *B*, 4 credits in conversation and composition with a grade of *B*, and 6 credits in Spanish literature, of which at least 3 must be chosen from courses numbered above 100. Majors who have had up to the senior year no grades below *B* in Spanish, and in exceptional cases only, majors who have had one or two grades of *C* in the elementary stage of the study of the language, will submit a thesis. Majors not falling in the above described groups may apply to the chairman of the department for permission to write a thesis. Beginning with the academic year 1933-34, students must take, before graduation, a comprehensive examination in the major field, covering conversation, phonetics, composition, grammar, literature, civilization, and educational methods; this procedure is optional for students to be graduated in 1932 and 1933. The department has prepared a reading list of the most important standard works, for which students will be held responsible, at the time of the examination whether or not they have studied them in regular courses. For further information about this examination, application may be made to the departmental office.

MINOR. 18 credits in advance of 1b. The required courses are: 2 credits in conversation and composition and 3 credits in literature. Minor students are advised (but not required) to elect Spanish 190, and also Educational Methods 81, if not majoring in another foreign language.

Educational Methods 81. The Teaching of Spanish. I, II; 3 cr. Miss Johnson.

PORTUGUESE. Special arrangements will be made for students interested in majoring or minoring in this language.

SPEECH

ANDREW THOMAS WEAVER, *Ph.D.*, Professor of Speech, *Chairman*

MAJOR. A minimum of 34 credits, including Educational Methods 198 or 189 and 12 credits in courses numbered above 100.

MINOR. A minimum of 15 credits in approved courses, including Educational Methods 198 or 189.

Educational Methods 189. The Teaching of Speech in the Grades. II; 2-3 cr. Pre-school, kindergarten, grades 1-8. Practice teaching in Madison public schools. Miss Borchers.

Educational Methods 198. The Teaching of Speech in High School and College. I; 2-3 cr. Miss Borchers.

ZOOLOGY

MICHAEL FREDERIC GUYER, *Ph.D., LL.D.*, Professor of Zoology, *Chairman*

MAJOR. A minimum of 30 credits, which will customarily include the following courses: Botany 1, Zoology 1, 102, 104, 105, and 9 or 126. Changes in the list of required courses may be made only by arrangement with the adviser. Students with upper-group status who have invitation or consent of their major professor are privileged to undertake original work in the thesis as a part of the minimum requirement.

MINOR. A minimum of 15 credits from the following courses: Zoology 1, 2, 102, 104, and 105. Attention is called to Courses 1 and 2, which together constitute a year's work, and are especially adapted to the needs of those taking a minor in zoology.

Educational Methods 71. The Teaching of Biology. I, II; 3 cr. Miss Weber.

COURSE IN ART EDUCATION

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (ART EDUCATION)

W. H. VARNUM, CHAIRMAN, PROFESSOR OF ART EDUCATION

The Department of Art Education offers a four-year curriculum including the freshman, sophomore, junior, and senior years. For graduates there is a joint major in Art Education and Education, leading to the second degree.

PURPOSE AND PLAN. The studies included in the Course in Art Education are of two types: (1) those designed to familiarize the student with basic and advanced art practice and appreciation, art curriculum building, and teaching practice, leading to the development of teachers and supervisors of art (drawing, painting, design, commercial and professionl art, and the art crafts) in public and private schools, teachers' colleges, and universities; (2) art courses primarily selected by students not enrolled in the Art Education course, but who desire an appreciative or professional knowledge of art theory and practice through studio participation.

The chart accompanynig this course presents a graphic view of the entire departmental plan. The chart is divided into five vertical columns representing requirements and electives. The columns relate to (A) English requirements, (B) natural sciences, (C) history or foreign languages, (D) art education, (E) education, (F) electives. Below the double horizontal line are the various options open to the student under each heading and the number of options to be selected. Black areas within each column represent the minimum course requirements, while the shaded areas extend the black columns to the maximum. Elections from each column are obligatory.

GENERAL REQUIREMENTS. Although transfers to the Course in Art Education may be made at the opening of any semester, it is desirable to enroll in the freshman year. A total of 124 credits and 124 grade-points is required for graduation. Of this number 53 to 68 credits (inclusive of 6 credits in Art Education 1 and Art Education 50-51) must be taken in departmental courses or their related options as indicated in Column D.

DETAILED REQUIREMENTS. ENGLISH: COLUMN A. Ten or twelve credits of English are required under options 1, 2, or 3, of which one option is to be selected.

Option 1—Freshman English and sophomore survey of English literature in historical sequence.

Option 2—Freshman English and sophomore introduction to English literature from the appreciative rather than the historical viewpoint.

Option 3—Freshman English and sophomore composition.

The sophomore English course elected in the first semester must be continued in the second semester.

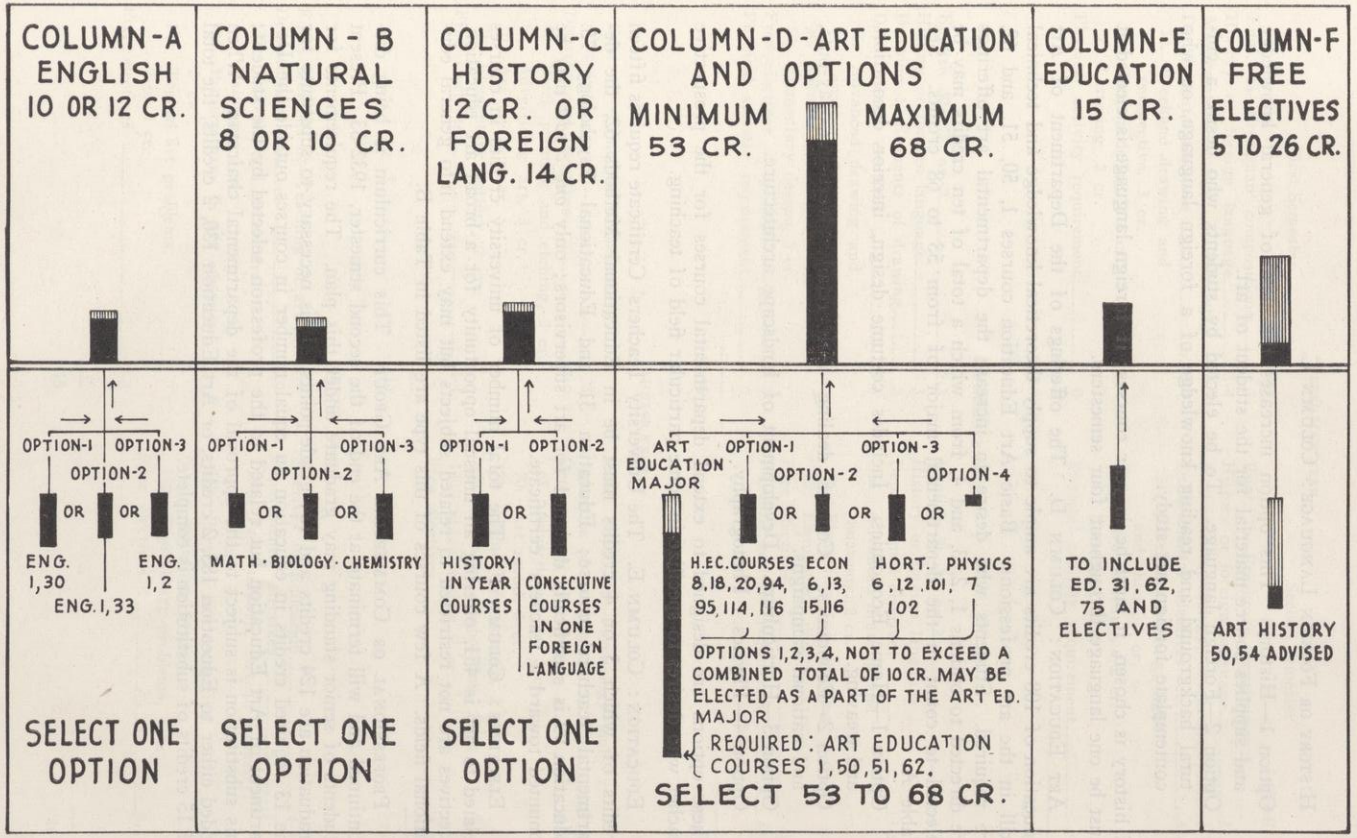
NATURAL SCIENCES: COLUMN B. Eight to ten credits are obligatory under any one of the three options: eight in mathematics or ten in either biology or chemistry.

Option 1—Mathematics. Desirable for students who are interested in later graduate courses in educational statistics.

Option 2—Biology. For increasing the art student's field of source material.

Option 3—Chemistry. Applying directly to the art-crafts courses and graduate work in color analysis.

A science elected in the first semester of the freshman year must be continued throughout the year. Basic training in clear analytical thought underlies all science requirements.



COURSE IN ART EDUCATION

HISTORY OR FOREIGN LANGUAGE: COLUMN C.

Option 1—History. This option increases the field of general knowledge and supplies source material for the student of art.

Option 2—Foreign language. To be elected by students who desire a cultural background and reading knowledge of a foreign language, or who contemplate foreign art study.

If history is chosen, it must be in year courses; if foreign language is elected it must be one language throughout four semesters.

ART EDUCATION: COLUMN D. The offerings of the Department of Art Education of 108 credits are ample to supply theoretical knowledge and technical skill in the art professions. Basic Art Education courses 1, 50, 51, and 62, are required. Students who desire to increase the departmental art offerings are directed to options 1, 2, 3, and 4, from which a total of ten credits may be selected to count in the departmental major of from 53 to 68 credits. See Table A.

Option 1—Home Economics. Includes costume design, interior decoration, and weaving.

Option 2—Economics. Courses dealing with retail advertising, lay-outs, and national campaigns.

Option 3—Horticulture. Development of landscape architecture.

Option 4—Physics. Photography.

These options are designed to extend departmental courses for the prospective teacher who desires to specilize in some particular field of teaching.

EDUCATION: COLUMN E. The University Teachers' Certificate requires fifteen credits of which 3 or 4 credits must be in Educational Methods 62, the departmental teachers' course; Education 31 and Educational Psychology 75. Education 99 is specifically designed for art supervisors; only *one credit* may be counted toward a teachers' certificate.

ELECTIVES: COLUMN F. The total number of university credits in courses related to art is 431, offering an unusual opportunity for a broad art education. Electives are not restricted to related subjects but may extend into general educational fields. A few courses of this type are listed in Table B.

PROFESSIONAL OR COMMERCIAL ART GROUP. This curriculum is being discontinued and will terminate at the end of the second semester, 1932-33. Present students of senior standing may graduate under this plan. The requirements for graduation are 124 credits and 124 grade-points. It is necessary to substitute for the 13 required credits in education an equal number in courses outside the Department of Art Education but related to the profession selected by the student; this substitution is subject to the approval of the departmental chairman. When added either to Education 183, 2 credits, or Art Education 130, 2 credits, the total of 15 credits of substitution is complete.

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
History or foreign language	3-4	History or foreign language	3-4
Mathematics, biology, or chemistry	4-5	Mathematics, biology, or chemistry	4-5
Departmental electives	5-4	Departmental electives	5-4
50. Freehand drawing and perspective, 3 cr.		51. Freehand drawing; light and shade, 3 cr.	
54. Clay modeling, 1-2 cr.		54. Clay modeling, 1-2 cr.	
7. Lettering, 2 cr.		8. Lettering, 2 cr.	
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

SOPHOMORE YEAR

English 30, 33, or 2	2-3	English 30, 33, or 2	2-3
History or foreign language	3	History or foreign language	3
Drawing 1—Elements of drawing	3	Departmental electives	3-6
Departmental electives	3-6	55. Advanced drawing and anatomy, 2 cr.	
55. Advanced drawing and anatomy, 2 cr.		56. Elementary oil painting, 3 cr.	
56. Elementary oil painting, 3 cr.		62. Elementary design, 3 cr.	
62. Elementary design, 3 cr.		Free electives	4
Free electives	4-1	Physical activity requirement	0
Physical activity requirement	0		
	15-16		15-16

JUNIOR YEAR

Educ. 31—Principles of secondary education	3	Educ. Psych. 75—Psychology and practice of teaching	5
Departmental electives	7-9	Departmental electives	7-9
60. Block printing and etching, 2 cr.		63. Advertising art, 3 cr.	
63. Advertising art, 3 cr.		70. Art metal, 3 cr.	
70. Art metal, 3 cr.		71. Elementary pottery, 2 cr.	
71. Elementary pottery, 2 cr.		120. Pictorial composition, 2 cr.	
Free electives	6-4	140. Stage design, 2 cr.	
		Free electives	4-2
	16		16

SENIOR YEAR

Educ. Methods 62—Teaching of art	3-4	Electives in Education	4-3
Departmental electives	6-9	Departmental electives	5-7
132. Portrait and decorative painting, 3 cr.		130. Pro-seminary, Art in industry, 2 cr.	
134. Pro-seminary in art education, 2 cr.		132. Portrait and decorative painting, 3 cr.	
180. Topical art problems, 2 or 3 cr.		180. Topical art problems, 2 cr.	
Free electives	7-3	Free electives	8-5
	16		16

ELECTIVES: TABLE A

The following courses may be included as departmental electives (Column D) by students in the Art Education Course:

City Plan. 101—City planning and zoning 2
Econ. 6—Business letters and reports 2
Econ. 13—Marketing methods 2
Econ. 15—Principles of advertising 2
Econ. 16—Problems in national advertising 2
Hort. 6—Landscape gardening 3
Hort. 12—Elem. home grounds design 3
Hort. 101—Adv. home grounds design 3
Hort. 102—Civic problems 3
Journ. 4—Typography 1
Physics 7—Photography 2
Home Econ. 8—House decoration 2
Home Econ. 18—House decoration lab. 2
Home Econ. 20—Costume appreciation and selection 2
Home Econ. 94—Adv. applied design 3
Home Econ. 95—Weaving 1-2
Home Econ. 114—Seminary 2
Home Econ. 116—Seminary 2

ELECTIVES: TABLE B

The following are a few of the general electives (Column F) recommended for the consideration of students in this course:

Anatomy 120—Human anatomy 6
Art Hist. 50—Ancient and medieval art epochs 2-3
Art Hist. 54—Modern painting and its antecedents 2-3
Econ. 1a-1b—General economics 8
Sociol. 1-2—Introductory sociology 6
Psych. 1—Introductory psychology 3
Psych. 50—Applied psychology 2
Speech 1—Fundamentals of speech 3
Speech 7—Public speaking 2
Comp. Lit. 68—Contemporary novel 2
Educ. 181—Vocational guidance and counseling techniques 2-3

PHYSICAL EDUCATION

Professional courses for teachers of physical education and for directors of play and recreation were organized at the beginning of the year 1911-12. The course as it was first instituted was adapted to the needs of both men and women in one curriculum, but as the scope of the field developed, incorporating more and more of the informal side of physical education, particularly games and athletics —the more natural forms of exercise—there has come more specialization within the field itself. Notwithstanding the fact that the formal side of physical education has not been overlooked, and that the former course made ample provision for the qualification of men and women to accept responsible positions as physical educators, the demand now in the educational field requires men to be especially fitted to coach, direct, and supervise all forms of games and athletics, as well as to teach the formal and corrective phases of physical education. With these distinctions in mind as to the requisites for men and women in this particular vocation, the faculty of the University has approved separate and distinct courses for men and women, as outlined below, both leading to the degree of Bachelor of Science (Physical Education).

COURSE IN PHYSICAL EDUCATION AND ATHLETIC COACHING FOR MEN

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (PHYSICAL EDUCATION)

G. S. LOWMAN, CHAIRMAN, PROFESSOR OF PHYSICAL EDUCATION

A total of 124 credits and 124 grade-points is required for graduation from this course. Students who present three high-school units in one foreign language, or a total of four units in two languages, are exempt from further study of foreign language. Students who present less than this amount of foreign language are required to earn eight credits in one language, and also to carry a year of sophomore composition. See Introductory Bulletin.

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Foreign language, mathematics or history	4-5	Foreign language, mathematics or history	4-5
Chem. 1a—General chemistry	5	Chem. 1b—General chemistry	5
Phys. Ed. 6—Theory and practice	3	Phys. Ed. 7—Theory and practice	3
Physical activity requirement	0	Physical activity requirement	0
	15-16		15-16

SOPHOMORE YEAR

Zool. 1—Animal biology	5	Zool. 2—General zoology	5
Anat. 39—Human anatomy	4	Physiology 3—Animal physiology	4
Educ. 31—Principles of secondary education	3	Phys. Ed. 16—First aid to injured	1
Phys. Ed. 8—Theory and practice	3	Phys. Ed. 9—Theory and practice	3
Physical activity requirement	0	Academic elective	2-3
	15	Physical activity requirement	0
			15-16

JUNIOR YEAR

Phys. Ed. 58—Human mechanics	2	Phys. Ed. 107—Effects of physical activities on the body	2
Phys. Ed. 59—Nature, function, and organization of play	3	Hygiene 5 or Educ. 187 (Hygiene)	2
Educ. 75—Psychology and practice of teaching	5	Phys. Ed. 118—Physical examinations and therapeutics	3
Physiol. Chem. 114—Physiological chem.	3	Phys. Ed. 71—Camp administration and scouting	3
Phys. Ed. 10—Theory and practice	3	Phys. Ed. 11—Theory and practice	3
		Electives in education	3
	16		16

SENIOR YEAR

Phys. Ed. 119—Physical examinations and therapeutics	3	Phys. Ed. 168—Organization and administration	2
Phys. Ed. 164—School health problems	2	Educ. Methods 70—Teaching of physical education	3-4
Phys. Ed. 100—Thesis or elective	2	Educ. 99—Theory and practice of supervision	3
Phys. Ed. 12—Theory and practice	3	Phys. Ed. 100—Thesis or elective	2
Academic electives	6	Phys. Ed. 13—Theory and practice	3
		Academic electives	2-3
	16		14-16

DEPARTMENTAL ELECTIVES

Phys. Ed. 80—Community recreation	2	Phys. Ed. 166—Physical therapy	2-3

MINOR IN PHYSICAL EDUCATION

This minor is offered to qualify men to assist in the general physical education program and to coach and supervise athletics in high schools and colleges in connection with the teaching of some academic subject; it may be elected by men students majoring in academic fields in the School of Education. Practice work without academic credit may be arranged at the discretion of the department, according to the student's needs. The completion of this minor does not entitle one to a special physical education teaching license in Wisconsin.

	Credits
Educational Methods 70—Teaching of physical education	3
Physical Education 168—Organization and administration	2
Physical Education 59—Nature, function, and organization of play	3
or	
Physical Education 107—Effects of physical activities (physiology of exercise)	(2)
Physical Education 17—Athletic training and first aid	2
Physical Education 8—Activities program (theory and practice)	2-3
Physical Education 9—Activities program (theory and practice)	2-3
	15

COURSE IN PHYSICAL EDUCATION FOR WOMEN

LEADING TO THE DEGREE OF BACHELOR OF SCIENCE (PHYSICAL EDUCATION)

BLANCHE M. TRILLING, CHAIRMAN, PROFESSOR OF PHYSICAL EDUCATION

No one will be accepted as a student in this course for less than three years of study, except by transfer from an accredited course in physical education. A student is on probation with the department for her first year. At the end of that time, or later, if she does not meet the departmental standard of scholarship, general aptitude, health, and ability, the department reserves the right to ask the student to withdraw from the department.

A total of 124 credits and 124 grade-points is required for graduation from this course. Students who present less than four high-school units of foreign language are required to earn 14 credits in one language, and those who present four or more units are required to earn 8 credits in one language. See Introductory Bulletin.

GRADUATE WORK. In addition to the undergraduate curriculum outlined below, opportunity is offered for graduate work leading to an M.A. or an M.S. in Physical Education. For further information see Graduate Bulletin.

FRESHMAN YEAR

First Semester	Credits	Second Semester	Credits
Engl. 1a—Freshman composition	3	Engl. 1b—Freshman composition	3
Foreign language	4	Foreign language	4
Chem. 1a—General chemistry	5	Chem. 1b—Qualitative analysis	5
History	3	History	3
Phys. Ed. 20—Practice in gymnastics and sports	0	Phys. Ed. 43—Folk dancing	1
		Phys. Ed. 20—Practice in gymnastics and sports	0
	15		16

SOPHOMORE YEAR

Physics 65—General physics	3	Physics 65—General physics	3
Zool. 17—Elementary zoology	3	Anatomy 120—Human anatomy	6
Foreign language or elective	3-5	Foreign language or elective	3-5
Phys. Ed. 42—Plays and games	2	Phys. Ed. 31—Principles of coaching	2
Phys. Ed. 49—Folk dancing	1	Phys. Ed. 20—Practice in dancing, gymnastics, and sports	0
Elective	2		
Phys. Ed. 20—Practice in dancing, gymnastics, and sports	0		
	14-16		14-16

JUNIOR YEAR

Phys. Ed. 56—Kinesiology	3	Physiology 116—Physiology	3
Physiology 115—Physiology	5	Phys. Ed. 176—Therapeutic gymnastics	2
Physiol. Chem. 114—Physiological chemistry	3	Phys. Ed. 41—Selection and practice of activities for schools	2
Phys. Ed. 32—Principles of coaching	2	Phys. Ed. 33—Principles of coaching	2
Phys. Ed. 175—Therapeutic gymnastics	2	Educ. 75—Psychology and practice of teaching	5
Phys. Ed. 20—Practice in dancing, gymnastics, and sports	0	Elective	2
		Phys. Ed. 20—Practice	0
	15		16

SENIOR YEAR

Educ. Methods 69—Teaching of physical education	4
Elective in Education	3
Phys. Ed. 100—Thesis	2
Electives	5-7
Phys. Ed. 20—Practice in dancing, gymnastics, and sports	0
	14-16

Medicine 118—Physical examination	2
Phys. Ed. 168—Organization and administration	2
Hygiene 5 or Phys. Ed. 198—Health education	2
Educ. 31—Principles of secondary education	3
Phys. Ed. 100—Thesis	2
Electives	3-5
Phys. Ed. 20—Practice	0
	14-16

Practice teaching included in Educ. Methods 69 and Education 75.

CERTIFICATE IN PHYSICAL THERAPY

After the completion of the junior year, students who desire to qualify for a certificate in physical therapy may arrange to obtain the requisite training by taking Physical Education 166 and 263, in lieu of other electives, and by doing practical work in the Wisconsin General Hospital and the Orthopedic Hospital for Children. This work will normally involve four months of specialized practice after graduation from the Physical Education Course. It is strongly urged that a course in sociology be elected in addition to the above.

This plan has been approved by the American Physiotherapy Association and the American Medical Association, and the university certificate is accepted by them. Students receiving the certificate are accepted as physical therapy aides in schools and hospitals for the disabled.

DANCE MAJOR

Because of the heavy activity program carried without academic credit, it is strongly urged that four years and two summers or five years be given to the course. This would enable the student to elect other related subjects and to start studying for a master's degree. In the case of students transferring from other institutions, three years of residence work is usually required to meet the technical standards of this department.

The following is a suggested outline showing the possibility of completing this course in four years and one summer.

FRESHMAN YEAR

First Semester

	Credits
Engl. 1a—Freshman composition	3
Foreign language	4-3
Science (botany preferred)	5
History or mathematics	3-4
Phys. Ed. 20—Practice in dancing, gymnastics, sports	0
	15

Second Semester

	Credits
Engl. 1b—Freshman composition	3
Foreign language	4-3
Science (zoology preferred)	5
History or mathematics	3-4
Phys. Ed. 43—Elementary folk dancing	1
Phys. Ed. 20—Practice in dancing, gymnastics, sports	0
	16

SOPHOMORE YEAR

First Semester	Credits
Psych. 1—Introductory psychology	3
Psysiology 1—Human physiology	4
Engl. 33a or 30a—Literature	2-3
Speech 7—Public speaking	2
Speech 6—Voice training	2
Phys. Ed. 49—Folk dancing	1
Phys. Ed. 60—Rhythmic form and analysis	1
Phys. Ed. 20—Practice	0
	15-16

Second Semester	Credits
Philos. 11—Elementary logic	3
Engl. 33b or 30b—Literature	2-3
Art Hist. 54—Modern painting	3
Educ. 31—Principles of secondary education	3
Speech 18—Oral interpretation of literature	3
Phys. Ed. 31—Principles of coaching	1
Phys. Ed. 33—Principles of coaching	1
Phys. Ed. 20—Practice	0
	16-17

SUMMER SESSION

Anatomy 120—Human anatomy, 6 cr.

JUNIOR YEAR

Art Hist. 50—Ancient and medieval art	3
Speech 16—Dramatic expression	2
Music 72—Music education	2
Phys. Ed. 56—Kinesiology	3
Phys. Ed. 175—Therapeutic gymnastics	2
Phys. Ed. 41—Selection and practice of activities for schools	2
Phys. Ed. 20—Practice	0
	14

Educ. 75—Psychology and practice of teaching	5
Music 67—Community festivals and pageant movements*	2
Music 72—Music education	2
Phys. Ed. 160—Advanced rhythmic form and analysis	2
Phys. Ed. 176—Therapeutic gymnastics	2
Philos. 21—Introduction to philosophy	3
Phys. Ed. 20—Practice	0
	16

*Offered only in alternate years; Art Education 140 should be substituted and Music 67 be taken in the senior year.

SENIOR YEAR

Electives in Education	3
Elective—Comp. Lit. 165	3
Educ. Methods 69—Teaching of physical education	4
Phys. Ed. 146—Theory of the dance	3
Phys. Ed. 100—Thesis	2
Phys. Ed. 20—Practice	0
	15

Philos. 25—Relation of man to nature	3
Art History	3
Art. Educ. 140—Stage design	2
Phys. Ed. 165—Dance composition	2
Phys. Ed. 100—Thesis	2
Phys. Ed. 20—Practice	0
Phys. Ed. 168—Organization and administration	2
Elective	2
	16

Electives are golf, horseback riding, bowling, indoor and outdoor baseball, tennis, archery, basketball, hockey, and gymnastics.

COURSES FOR TEACHERS OF AGRICULTURE AND HOME ECONOMICS

The four-year courses in Agriculture and in Home Economics are given in the College of Agriculture. Students who are planning to teach these subjects, and to qualify for the University Teachers' Certificate, *should register in the School of Education at the beginning of the junior year.* Detailed information concerning all the courses offered may be found in the special bulletins of the College of Agriculture.

Graduates of the four-year Course in Agriculture and of the Course in Home Economics who have complied with the regulations relative to registration and to approval of major and minor subjects will be entitled to receive the University Teachers' Certificate upon fulfillment of the special professional requirements indicated below.

AGRICULTURE AND EDUCATION

JOHN AMBROSE JAMES, *B.S.*, Professor of Agricultural Education, *Chairman*

Students in the College of Agriculture who wish to prepare for the teaching of agriculture in secondary schools must complete, in addition to a major, the general requirements of the Long Course in Agriculture and the fifteen credits in education required for the University Teachers' Certificate as outlined below. The major consists of a minimum of fifteen elective credits in any department of the College of Agriculture. Students are advised to follow the elective list furnished by the Department of Agricultural Education in order to have proper technical courses.

Students who receive the degree of Bachelor of Science (Agriculture and Education) and who have satisfied the following requirements are entitled to receive the University Teachers' Certificate and a license to teach issued by the State Superintendent: (a) registration in the School of Education at the beginning of the junior year, (b) the recommendation of the College of Agriculture, (c) the completion of the following courses:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75—Psychology and practice of teaching	5
Agr. Educ. 1—Rural education	2
Agr. Educ. 128 (301)—Program building in vocational agriculture	2
Educ. Methods 50 (302)—Teaching of agriculture	3
	15

Graduates of the professional courses of the state teachers' colleges who are majoring in agriculture and who wish to qualify for the University Teachers' Certificate should elect 8 credits as follows:

	Credits
Education (advanced)	3-4
Agricultural Education (advanced)	2-3
Educ. Methods 50—Teaching of agriculture	3
	8

Candidates may be excused from Educational Methods 50 with the approval of the Chairman of the Department of Agricultural Education.

Educational Methods 50. The Teaching of Agriculture. I, II; 3 cr. Mr. Kivlin.

HOME ECONOMICS AND EDUCATION

ABBY LILLIAN MARLATT, *M.S., Sc.D.*, Professor of Home Economics, *Director*

MAJOR. In the general education major, the food major, the textile major, the related art major, or the vocational education major, the minimum requirements in home economics subjects taken during the junior and senior years are 25 credits, four of which represent the thesis or its equivalent. The special courses vary with the major, but not more than 40 strictly home economics credits may be counted toward the 124 credits required for graduation. For details see special bulletin of the Course in Home Economics. The following courses are required for the teachers' certificate:

	Credits
Educ. 31—Principles of secondary education	3
Educ. 75.—Psychology and practice of teaching	5
Educ. Methods 52—Teaching of home economics	4
Electives in the Department of Education	3
	15

MINOR. A minor may be taken in foods, textiles, related art, or housing problems, including 10 to 20 credits in strictly related courses.

(1) A teaching minor in foods includes Educational Methods 52 and Home Economics 1a, 1b, and other related courses, such as 4 and 6-16, to make 15 to 20 credits in strictly home economics subjects.

(2) A teaching minor in textiles includes Home Economics 5, 10, 11, 20, 50, 97, Educational Methods 52, 53, and other courses in home economics to complete 20 credits.

(3) A teaching minor in related art includes Home Economics 2, 12, 20, 8, 18, 94, 95, 116, 121, 194, and related home economics subjects to complete 20 credits.

(4) The housing minor is offered to students majoring in sociology in order that those intending to do special settlement or social welfare work will have a broader foundation knowledge of the fundamental problems in housing. Home Economics 1a, 1b, 7, 17, and other related courses may be elected in the minor.

Educational Methods 52. The Teaching of Home Economics. I, II; 4 cr. Miss Henderson.

DEPARTMENTS OF INSTRUCTION

Abbreviations used in the announcement of courses:

Yr—a continuous course extending through two semesters
I—course given during the first semester
II—course given during the second semester
I, II—semester course given each semester
cr—number of credit hours per semester
*—to be arranged

Courses numbered under 100 may be credited only by undergraduates; those in the 100-group may be credited by both undergraduates and graduates; those in the 200-group are ordinarily open only to graduates.

ART EDUCATION

Students who desire to supplement, by studio participation, courses offered in other departments, should enroll in the following courses: Speech 19 and Art Education 140, Stage design; Art History 101 and Art Education 60, Block printing and etching; Art History 50 or 54 and Art Education 50 (Section 3—Tools, materials, and technic of the artist).

William Harrison Varnum, B.P., *Professor of Art Education, Chairman*
Roland Stewart Stebbins, *Assistant Professor of Art Education*
Della Ford Wilson, M.A., *Assistant Professor of Art Education*
Charles E. Brown, M.A., *Lecturer in Art Education*
Frank Stillman Moulton, A.I.A., *Lecturer in Art Education*
Helen Wann Annen, B.A., B.F.A., M.S., *Instructor in Art Education*
Wayne Lemere Claxton, B.S., *Instructor in Art Education*
Howard Bailey Doke, *Instructor in Drawing and Descriptive Geometry*
Frank Zozzora, B.A., *Instructor in Art Education*

50. Freehand Drawing and Perspective. I; 3 cr. Introduction to pictorial expression. Open to freshmen. Lab. fee $1.25. 3 sections—8-10 MWF, 1:30-3:30 MWF, 8-10 TTS. Mr. Zozzora.

51. Freehand Drawing: Light and Shade. II; 3 cr. Prerequisite: Art Education 50. Lab. fee $3.00. 3 sections—8-10 MWF, 1:30-3:30 MWF, 8-10 TTS. Mr. Zozzora.

52. Elementary Watercolor Rendering. II; 2-3 cr. Prerequisites: Art Education 50 and 51. Lab. fee $1.75. 10-12 TT and assigned period. Mrs. Annen.

53. Art Digest: Orientation. Yr; 2 cr. Open to freshmen. 11 TT. Mr. Varnum.

54. Elementary Modeling. Yr; 1 or 2 cr. Introduction to plastic expression. Lab. fee per semester: 1 cr., $3.00; 2 cr., $6.00. 1:30-3:30 TT. Miss Wilson.

55. Advanced Drawing and Anatomy. Yr; 2 cr. Prerequisite: Art Education 51 or consent of instructor. Lab. fee $4.00 per semester. 1:30-3:30 TT. Mr. Stebbins.

56. Elementary Oil Painting. Yr; 3 cr. Prerequisites: Art Education 50 and 51. Lab. fee $2.00 per semester. 8-10 MWF. Mr. Stebbins.

57. Mechanical Perspective and Architectural Rendering. II; 3 cr. Prerequisites: Art Education 1 and 50. Lab. fee $2.00. Not offered in 1932-33. Miss Wilson and special lecturers.

60. Block Printing and Etching. I; 2 cr. Prerequisites: Art Education 51, 62; also open to students registered or with credit in Art History 101 and 102. Lab. fee $4.50. 1:30 TT. Mr. Varnum.

61. Elementary School Art and Industrial Arts. (Formerly 304). Yr; 3 cr. Prerequisite: Junior standing. Lab fee $6.00. 8-10 TTS. Miss Wilson.

62. Elementary Creative Design. Yr; 3 cr. Prerequisites: Art Education 1, 50. Lab. fee $1.00 per semester. 2 sections—10-12 MWF, 1:30-3:30 MWF. Mrs. Annen.

63. Advertising Art. Yr; 3 or 4 cr. Prerequisites: Art Education 7, 50, and 62. Lab. fee $1.50 per semester. 8-10 MWF. Mr. Claxton.

68. Advanced Modeling. II; 3 cr. Prerequisites: Art Education 54 and 62. Lab. fee $6.00. Offered 1933-34 and in alternate years.

70. Art Metal. Yr; 3 cr. Copper, silver, gold, pewter. Lab. fee $6.00 per semester. 10-12 MWF. Mr. Claxton.

71. Elementary Pottery. Yr; 2 cr. Prerequisite: Art Education 62. Lab. fee $6.00 per semester. Not offered in 1932-33. Miss Wilson.

73. Wrought Art Metal. II; 2 cr. Not open to freshmen. Lab. fee $6.00. 3:30-5:30 TT. Mr. Schumann.

120. Pictorial Composition. I; 2 cr. Prerequisites: Art Education 62 and 63. 10 TT. Mrs. Annen.

121. Theory and Analysis of Composition. II; 2 cr. Preprequisite: Art Education 120. 9 TT. Mrs. Annen and staff.

125. Illustration. Yr; 2 cr. Prerequisite: Consent of instructor. Mr. Zozzora.

130. Pro-Seminary, Art in Industry. II; 2 cr. Prerequisite: Senior standing. 4-5:45 Tu. Mr. Varnum.

132. Portrait and Decorative Painting. Yr; 3 cr. Prerequisite: Art Education 56. Lab. fee $5.00 per semester. 10-12 MWF. Mr. Stebbins.

134. Pro-Seminary in Art Education. I; 2 cr. Open to graduate students and seniors with adequate preparation. 4-5:45 Tu. Mr. Varnum.

140. Stage Design. II; 2 cr. Application of principles of design to scenic art. Prerequisite: Art Education 62. Also open to students registered or with credit in Speech 19, or with graduate standing in speech. 1:30 MW. Mr. Varnum.

155. Museum Research. I, II; 2 cr. Prerequisite: Junior standing. Mr. Varnum.

156. Museum Administration. I, II; 2 cr. Prerequisite: Senior standing. Mr. Brown.

164. Art Curriculum Construction. I; 2 cr. Prerequisite: Junior standing. 10 TT. Miss Wilson.

180. Topical Art Problems. Yr; 2-3 cr. Prerequisite: Senior standing. Wilson and staff.

200. Graduate Research. Yr; 2-5 cr. A detailed study of a definite problem in the field of art education. Mr. Varnum.

210. Seminary, Art Education. Yr; 2 cr. Prerequisite: Graduate standing or teaching experience. 3:30-5:30 W. Mr. Varnum.

TEACHERS' COURSE

The Teaching of Art. See Educational Methods 62, page 384.

DRAWING

Joseph Dow Livermore, B.S., *Assistant Professor of Drawing and Descriptive Geometry*
Howard Bailey Doke, *Instructor in Drawing and Descriptive Geometry*

These courses are offered by the Department of Drawing and Descriptive Geometry in the College of Engineering.

1. Elements of Drawing. I, II; 3 cr. Working drawings, third angle projection, lettering, tracing, and blueprinting. Open to freshmen. Two sections especially adapted to students in Art Education; 10-12 MWF and 10-12 TTS. Lab. fee $1.00. Mr. Livermore, Mr. Moulton.

7. Freehand Lettering. I, II; 1 or 2 cr. Construction and composition of Classic Roman capitals, lower-case letters, English Gothic, black letter, and modern script. Special emphasis given to the choice of lettering styles in advertising design. Lab. fee $.75. 8-10 TT or 10-12 MW. Mr. Doke.

8. Advanced Freehand Lettering. I, II; 2 cr. Continuation of Course 7, which is prerequisite. Lab. fee $.75. 10-12 TT. Mr. Doke.

9. Advanced Freehand Lettering. I, II; 2 cr. Continuation of Course 8, which is prerequisite. Lab. fee $.75. 10-12 TT. Mr. Doke.

EDUCATION

C. J. Anderson, Ph.M., *Professor of Education, Chairman*
Arvil Sylvester Barr, Ph.D., *Professor of Education*
Wayland Johnson Chase, M.A., *Professor of Education*
Frank Leslie Clapp, Ph.D., *Professor of Education*
Alanson Harrison Edgerton, Ph.D., *Professor of Guidance*
John Guy Fowlkes, Ph.D., *Professor of Education*
Curtis Merriman, Ph.D., *Professor of Education*
Alexander Meiklejohn, Ph.D., LL.D., *Professor of Philosophy*
Heber Hinds Ryan, Ph.D., *Associate Professor of Education*
Matthew H. Willing, Ph.D., *Associate Professor of Education*
Kai Jensen, Ph.D., *Assistant Professor of Education*
Clarence Edwin Ragsdale, Ph.D., *Assistant Professor of Education*
Theodore L. Torgerson, Ph.D., *Assistant Professor of Education*
Hugh Payne Greeley, B.A., M.D., *Lecturer in Education*
Roy Aaron Hinderman, M.S., *Lecturer in Education*
Glenn Henderson Nelson, Ph.M., *Lecturer in Education*

Students below the junior class are not admitted to courses in the Department of Education, except course 19 (open to sophomores), without the written permission of the instructor in charge. This permission will be granted only to mature students and to students properly prepared who are under the necessity of leaving the University, before graduation, to enter teaching.

Courses 1-4, 19, 31, 41, 75, and 99 are regarded as elementary and as introductory to the advanced courses given in the department. These courses are not open for election by graduates of professional courses of normal schools and teachers' colleges without special action by the department. Courses in the 200-group are open to qualified seniors who obtain the consent of the instructor.

Major. Candidates for a bachelor's degree who elect education as a major must meet the following specific requirements:

1. Twenty-four credits in education, including, courses 31, 75, and a minimum of two advanced courses in one of the following divisions of the Department of Education:

I. Educational Organization and Administration.
II. Educational Supervision.
III. Educational Curricula and Objectives.
IV. Instructional Procedures.
V. Measurements, Statistics, and Scientific Techniques.
VI. Guidance and Welfare.
VII. Educational Psychology.
VIII. History of Education.
IX. Philosophy of Education.
X. Educational Sociology.
XI. Special Fields.
(1) Vocational Education and Industrial Arts.

A minimum of 15 credits in education must be completed in residence at Wisconsin, and not more than 6 credits may be elected before the attainment of junior standing. Courses in the Department of Educational Methods can not be counted toward a major in the Department of Education. The undergraduate thesis in education has been discontinued.

2. They must meet the university requirements for a teaching major, with the exception of a thesis, in one academic department other than education, or for teaching minors in two academic departments other than education. (These requirements should be fulfilled in departments whose subjects are taught in elementary or secondary schools.) A student must earn as many grade-points as credits in these departments. Students who transfer from other institutions must complete a minimum of two advanced courses in their major or one advanced course in each of their minor subjects at the University of Wisconsin, and must earn as many grade-points as credits in the courses pursued in majors or minors at this University.

See pages 3-5 for Bureau of Educational Research, Supervisory Service Bureau, teachers' certificates, etc.

The numbering of courses in the Department of Education has been revised. For the convience of students and advisers the numbers formerly in use are inserted in parentheses after the title of the course.

ELEMENTARY COURSES

1-4. THEORY AND PRACTICE OF TEACHING. Yr; 4 cr. A continuous course of 3 to 4 semesters integrating theory, special methods, and practice in education for students majoring in English, mathematics, and science. Students registered in this course elect no other courses in education. Prerequisite: Junior standing and consent of instructor. 8 and 11 MWFq. Mr. Clapp., Mr. Davis, Mr. Hart, Mr. Pooley, Mr. Merriman, Mr. Willing.

19. CHILD DEVELOPMENT. I, II; 3 cr. Prerequisite: Sophomore standing. 9 MWF. Mr. Jensen.

31. PRINCIPLES OF SECONDARY EDUCATION. I, II; 3 cr. Historical development of American secondary schools, present magnitude. European comparisons, modern objectives, curriculum reorganization, professionalization of teachers. Should be elected as the first course in the Department of Education. Required of candidates for the University Teachers' Certificate. Prerequisite: Junior standing. 9 and 1:30 MWF. Mr. Willing, Mr. Clapp.

41. EDUCATIONAL PSYCHOLOGY. II; 3 cr. An elementary survey of the field of psychology with emphasis upon everyday school problems. Importance of instincts in motivation; types of learning; methods of teaching according to learning types; attention, how to study; economy in learning; elementary concepts in educational statistics. Students should have some acquaintance with the field of elementary general psychology. *Not open to students registered in the School of Education.* 2:30 MWF. Mr. Ragsdale.

47. THE PSYCHOLOGY OF LEARNING AND TEACHING. II; 3 cr. Open only to students registered in the School of Nursing. 2:30 MWF. Mr. Merriman.

75. PSYCHOLOGY AND PRACTICE OF TEACHING. I, II; 5 cr. Includes educational practice for *one credit* and laboratory work in educational psychology. Prerequisite: Education 31. Required of candidates for the University Teachers' Certificate. Lectures: 9 and 11 MWF. Mr. Merriman, Mr. Ryan, and staff teachers of the Wisconsin High School.

99. THEORY AND PRACTICE OF SUPERVISION. (39) II; 2-3 cr., one of which is applicable to the University Teachers' Certificate. Includes practice in supervision, group conferences under direction of departmental instructors, and lectures. Lecture 8 F. Mr. Barr, Miss Cronin, Mr. Gordon, Mr. Nohr, Miss Wilson.

INTRODUCTORY COURSE FOR GRADUATE STUDENTS

211. PROBLEMS AND METHODS OF RESEARCH. Yr; 3 cr. Content of the course: (1) current problems in education; (2) statistics; (3) measurements; (4) methods of research. Designed to give the graduate student a systematic and comprehensive survey of the basic problems, methods, and tools to be used in the study of education, to the end (a) that he may be able to see special educational problems in proper relation to other educational problems and to the field of education as a whole, (b) that he may become acquainted with the methods of attacking and solving educational problems, and (c) that he may bring to other graduate courses an adequate preparation. 9-11 TT. Mr. Anderson, Mr. Barr, Mr. Merrimann, and Mr. Torgerson.

I. EDUCATIONAL ORGANIZATION AND ADMINISTRATION

176. THE ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION. II; 2 cr. 11 MW. Mr. Fowlkes.

261. PRINCIPLES OF EDUCATIONAL ADMINISTRATION. (104) I; 3 cr. National, state, and county school organization and administration. 8 MWF. Mr. Fowlkes.

262. PRINCIPLES OF EDUCATIONAL ADMINISTRATION. (104) II; 3 cr. Local school organization and administration, including the administration of school systems as a whole and individual building administration. 8 MWF. Mr. Fowlkes.

271. BUSINESS ELEMENTS OF EDUCATIONAL ADMINISTRATION AND SCHOOL FINANCE. I; 3 cr. 9 MWF. Mr. Fowlkes.

272. SCHOOL BUILDINGS AND SCHOOL-BUILDING PROGRAMS. II; 2 cr. 9 MW. Mr. Fowlkes.

278. SEMINARY, SCHOOL ADMINISTRATION. Yr; 2 cr. 4:30-6 W. Mr. Fowlkes.

II. EDUCATIONAL SUPERVISION

193. INTRODUCTION TO EDUCATIONAL SUPERVISION. (139, 239) I; 3-5 cr. Prerequisite: Teaching experience. 4:30-5:45 TT. Mr. Barr and others.

291. SEMINARY, SUPERVISION OF INSTRUCTION. II; 2 cr. Prerequisite: Education 193 (139). 10 TT. Mr. Barr.

294. RESEARCH IN SUPERVISION AND THE IMPROVEMENT OF TEACHING. Yr; 2-3 cr. Mr. Barr.

III. EDUCATIONAL CURRICULA AND OBJECTIVES

140. Elementary School Curriculum. (111, 211) I; 3 cr. Principles which should determine the selection and arrangement of instructional material. A critical study of curricula now in use. Laboratory work in the formulation of courses of study in various subjects. Working plans for constructing a course of study for a school system. Offered 1932-33 and in alternate years. 1:30 MWF. Mr. Clapp.

141. Secondary School Curricula. (130, 230) I; 2-3 cr. A brief survey of the development of secondary school curricula to 1900, followed by an intensive study of curricular change and reconstruction in American secondary schools since 1900, and concluding with a formulation of contemporary criteria. 10 MW. Mr. Willing.

146. Industrial Curricula for Secondary Schools. (Industrial Education 166) II; 2-3 cr. Course making in specific subjects for given grade levels, and industrial curriculums in general and vocational education. Experimental laboratory work for third credit. Not offered 1932-33.

243. Curriculum Construction. (229) II; 2-3 cr. A study of the principles and techniques of curriculum research and curriculum-making appropriate respectively to specialists, national committees, state and local school systems, experimental schools, teacher committees, and individual supervisors and teachers. Mr. Willing.

244. Seminary in Secondary Education. (232) Yr; 2 cr. Content arranged through conference with instructor. 4:30-6 W. Mr. Willing.

245. Professional Preparation of Teachers. (235) II; 3 cr. Prerequisite: Teaching experience. 11-12:15 TT. Mr. Anderson.

247. Seminary, Theory of Higher Education. I; 3 cr. Mr. Meiklejohn.

248. Seminary, Contemporary Developments in Higher Education. II; 3 cr. Mr. Meiklejohn.

IV. INSTRUCTIONAL PROCEDURES

131. Investigations in the Teaching of Mathematics. (164) I; 2 cr. 11 MW. Mr. Fowlkes.

132. Investigations in the Teaching of the Social Studies. (166) I; 2 cr. 1:30 TT. Mr. Barr.

133. Investigations in the Teaching of Reading. (167) I; 2 cr. 11 TT Mr. Anderson.

136. The Foundations of Method. (190, 290) II; 3 cr. Prerequisite: Teaching experience. 4:30-5:45 TT. Mr. Barr.

V. MEASUREMENTS, STATISTICS, AND SCIENTIFIC TECHNIQUES.

123. TESTS AND MEASUREMENTS IN MUSIC. (142) I; 2 or 3 cr. Lectures 3:30 MW; 1 hour lab. Mr. Torgerson.

127. MENTAL TESTS. (146) I; 3 cr. Group testing. Lectures 1:30 MW; 1 hour lab. Mr. Torgerson.

128. MENTAL TESTS. (146) II; 3 cr. Individual testing (Binet). Lectures 1:30 MW; 1 hour lab. Mr. Torgerson.

137. EDUCATIONAL TESTS. (138) I; 3 cr. Classroom uses of tests. Lectures 9 MW; 1 hour lab. Mr. Torgerson.

138. EDUCATIONAL TESTS. II; 3 cr. Supervisory uses of tests. Lectures 4:30 MW; 1 hour lab. Mr. Torgerson.

221. SEMINARY IN ELEMENTARY EDUCATION. (263) Yr; 2 cr. 7-9 p.m. M. Mr. Clapp.

225. TEST CONSTRUCTION. (244) I; 2 or 3 cr. Informal objective tests. Prerequisite: Education 147 or 239. 7-9 p.m. W. Mr. Torgerson.

226. TEST CONSTRUCTION. (244) II; 2 or 3 cr. Aptitude tests. Prerequisite: Education 147 or 211. 7 p.m. W. plus lab. Mr. Torgerson.

VI. GUIDANCE AND WELFARE

180. PRINCIPLES OF EDUCATIONAL AND VOCATIONAL GUIDANCE. (113) I; 2-3 cr. 10 MW. Mr. Edgerton.

181. VOCATIONAL AND EDUCATIONAL GUIDANCE TECHNIQUES. (116) II; 2-3 cr. 11 MW. Mr. Edgerton.

183. JOB AND OCCUPATIONAL ANALYSIS. (154) I; 2 cr. Not offered 1932-33. Mr. Edgerton, Mr. Hinderman.

187. HEALTH AND HYGIENE. (119) II; 2 cr. 1:30 TT. Dr. Greeley.

284. SEMINARY IN EDUCATIONAL AND VOCATIONAL GUIDANCE. (216) Yr; 2 cr. 3:50-5:45 Tu. Mr. Edgerton.

VII. EDUCATIONAL PSYCHOLOGY

NOTE: *Courses in this group are to be elected and recorded as "Educational Psychology" rather than as "Education."*

105. PSYCHOLOGY OF THE ELEMENTARY SCHOOL SUBJECTS. (161) I; 3 cr. The functions of learning in the various subjects; the mental processes involved in mastering subject matter. The conformity of textbooks and of teaching procedure to the principles discussed; a review of the investigative literature in the field. Offered 1933-34 and in alternate years. 1:30 MWF. Mr. Clapp.

107. EXPERIMENTAL EDUCATION: MOTOR LEARNING. (182, 145) I; 5 cr. A critical study of the experimental and theoretical literature dealing with learning of physical and manual skills. Considers the problems of physical education, athletics, music, manual and vocational activities. Prerequisite: Consent of instructor. Lab. fee $2.50. 11 MWF; lab. Mr. Ragsdale.

109. Modern Systems of Psychology and Education. (184) I; 3 cr. A critical comparison of the more important viewpoints in present-day psychology, such as behaviorism, psycho-analysis, gestalt psychology, functionalism, together with the study of their effect upon present educational movements, i.e., individualized instruction, nursery schools, adult education, use of intelligence tests, etc. Prerequisite: Education 41, Education 75, or consent of instructor. 10 MWF. Mr. Ragsdale.

116. Psychology of the High-School Subjects. (131) II; 2 cr. Mr. Willing.

118. Psychology of Adolescence. I, II; 3 cr. 8 MWF. Mr. Jensen.

121. Physical Development. II; 2 cr. Physical development from birth to maturity, showing the bearing of the physical changes during childhood upon the principles of education. 1:30 MW. Mr. Ragsdale.

123. Psychology and Training of the Pre-School Child. I, II; 2 cr. A study of the development and education of children from infancy to the fifth year. 2:30-4:30 Th. Mr. Jensen.

143. The Psychology of Individual Differences and the Measurement of Intelligence. II; 3 cr. 11 MWF. Mr. Henmon.

144. The Psychology of Learning. I; 3 cr. 11 MWF. Mr. Henmon.

208. Experimental Education: Verbal Learning. (108,183) Yr; 3 cr. Laboratory and discussion. Prerequisite: Consent of instructor. 11-12:15 TT. Mr. Barr.

219. Seminary in Child Development. Yr; 2 cr. 7-9 Tu. p.m. Mr. Jensen.

245. Seminary, Motor Learning. II; 2 or 4 cr. Prerequisite: Education 182 or 107. Mr. Ragsdale.

248. Research in Educational Psychology. Yr; 1 or 2 cr. Mr. Merriman, Mr. Ragsdale.

249. Seminary, Educational Psychology. II; 2 cr. 4-6 M. Mr. Ragsdale.

VIII. HISTORY OF EDUCATION

101. History of Modern European Education. II; 2-3 cr. 8 MWF. Mr. Chase.

102. History of Ancient and Medieval Education. I; 2-3 cr. 8 MWF. Mr. Chase.

103. History of American Education. I, II; 2-3 cr. 10 MWF. Mr. Chase.

108. Contemporary American Education. I; 3 cr. A survey of democracy and experimentalism in contemporary American education. 11 MWF. Mr. Barr.

202. Proseminary, Medieval Education. I; 2-3 cr. 3:30-5:30 W. Offered 1933-34 and in alternate years. Open also to seniors. Mr. Chase.

203. Proseminary, History of American Education. II; 2-3 cr. 3:30-5:30 Th. Open also to seniors. Mr. Chase.

204. Proseminary, European School Systems. I; 2-3 cr. Open also to seniors. 3:30-5:30 Th. Offered 1932-33 and in alternate years. Mr. Chase.

IX. PHILOSOPHY OF EDUCATION

114. Social Aspects of Education. (125) II; 3 cr. Not offered in 1932-33.

117. Philosophy of Education. II; 2 cr. The political philosophy that determines the character of national systems of education. The social philosophy which justifies different plans of school organization and various types of schools. The philosophy underlying the various methods of teaching and of organizing subject matter. 1:30 MW. Mr. Clapp.

216. Social Philosophy of Education. (226) Yr; 2 cr. Not offered in 1932-33.

X. EDUCATIONAL SOCIOLOGY

112. Social Development and Education. I, II; 2 or 3 cr. The social traits and training of the individual with particular reference to the requirements for adaptation to and efficiency in American social life.

115. The School as a Social Institution. (128) I; 2-3 cr. An introductory course in educational sociology to initiate critical study of actual and proposed form of social control, direction, and operation in public democratic education. Reference is made especially to the secondary school. 2:30 MW. Mr. Willing.

XI. SPECIAL FIELDS

1. VOCATIONAL AND INDUSTRIAL ARTS

152. Principles of Vocational and Practical Arts Education. I; 3 cr. Not offered in 1932-33.

157. Advanced Problems in Part-Time Education. II; 2 cr.

196. The Supervision of Industrial Arts Education. I; 2 cr. Not offered, 1932-33.

254. Seminary in Vocational Education. Yr; 2 cr. 3:45-5:45 W. Mr. Edgerton.

259. Seminary in Industrial Arts Education. Yr; 2 cr. Prerequisite: Graduate standing or teaching experience. 4-5:45 M. Mr. Hinderman.

EDUCATIONAL METHODS

HEBER HINDS RYAN, Ph.D., *Associate Professor of Education, Chairman; Principal of Wisconsin High School*
GLADYS BARTON BASSETT, M.A., *Associate Professor of Physical Education*
KATHERINE L. CRONIN, M.A., *Associate Professor of Physical Education*
RUTH GLASSOW, M.A., *Associate Professor of Physical Education*
WALTER WILSON HART, B.A., *Associate Professor in the Teaching of Mathematics*
ROBERT NOHR, JR., G.G., *Associate Professor of Physical Education*
IRA CLEVELAND DAVIS, M.A., *Assistant Professor in the Teaching of Science*
CALLA A. GUYLES, Ph.B., *Assistant professor in the Teaching of Latin*
RUTH ADELE HENDERSON, M.A.. *Assistant Professor in the Teaching of Home Economics*
LAURA BUTLER JOHNSON, M.A., *Assistant Professor in the Teaching of French*
BURR WENDELL PHILLIPS, M.A., *Assistant Professor in the Teaching of History*
ROBERT CECIL POOLEY, M.A., *Assistant Professor in the Teaching of English*
LYNDA MARGUERITE WEBER, B.A., *Assistant Professor in the Teaching of Biology*
DELLA FORD WILSON, M.A., *Assistant Professor of Art Education*

Courses in this department are open to and *may be credited only by students who are registered in the School of Education* with a major or minor in the department concerned; not more than six credits in these courses may be counted toward a degree. *Education 75 and senior standing are prerequisites for these courses.*

(The numbering of courses in the Department of Educational Methods has been revised. For the convenience of students and advisers the numbers formerly in use are inserted in parenthesis after the title of the course.)

50. THE TEACHING OF AGRICULTURE. (302) I, II; 3 cr. Prerequisite: Agricultural Education 1. 9 M-F. Mr. Kivlin.

52. THE TEACHING OF HOME ECONOMICS. (352) I, II; 4 cr. Lect. 3:30 W. Lab. 3:30-5:30 F. Miss Henderson.

53. THE TEACHING OF CLOTHING CONSTRUCTION. (353) I, II; 2 cr. Selection of illustrative material for clothing courses in secondary schools. Study of suitable material and patterns for high-school instruction. Reports and demonstrations. Required of all students who are preparing to teach clothing. Prerequisites: Home Economics 2, 5, 11, 50 or consent of instructor. Lab. fee $4.50. 1:30-3:30 TT. Miss Manning and staff.

62. THE TEACHING OF ART. (306) II; 3-4 cr. 11 TT. Miss Wilson.

69. THE TEACHING OF PHYSICAL EDUCATION. (388) I; 4 cr. Prerequisites: Physical Education 20, 41. 9 MWF. Miss Cronin, Miss Bassett, Miss Glassow.

70. THE TEACHING OF PHYSICAL EDUCATION. (388) II; 3-4 cr. Prerequisites: Physical Education 58 and 59. Mr. Nohr.

71. THE TEACHING OF BIOLOGY. (310) I, II; 3 cr. 2:30 TT. Miss Weber.

72. THE TEACHING OF CHEMISTRY. (311) II; 2-3 cr. Prerequisites: Chemistry 1; first semester of Chemistry 120, or credit or enrollment for five credits in Chemistry 11. Mr. Walton.

75. The Teaching of Bookkeeping. (314) II; 3 cr. Prerequisite: Economics 8b. Practice teaching in bookkeeping is not offered in the Wisconsin High School; however, those who elect this course are required to do practication-teaching in another subject. Miss Hensey.

76. The Teaching of English. (340) II; 3-4 cr. Prerequisites: English 123, senior standing, and satisfactory grade in a qualifying examination covering (1) the elements of grammar, (2) the detection and correction of deviations from standard English, and (3) the English works commonly studied in high schools. This examination is given in the second semester of the junior year. 3 cr. for the minor; 4 cr. including one credit for participation-teaching, for the major. Mr. Pooley.

81. The Teaching of French and Spanish. (344) I, II; 2-3 cr. 11 TT. Miss Johnson.

82. The Teaching of Geography. (346) II; 3 cr. Prerequisites: Geography 1-2 or 5-6. Mr. Whitaker.

83. The Teaching of German. (347) I; 3 cr. For seniors and graduates. Special permission is necessary for graduate credit. 2:30 MW. Mr. Griebsch.

84. The Teaching of History and the Social Studies. (349) I, II; 3-4 cr. 3:30 MWF. Mr. Phillips.

90. The Teaching of Latin. (374) I, II; 3 cr. 2:30 TT. Miss Guyles.

93. The Teaching of Mathematics. (377) I; 3 cr. 8 TT. Mr.Hart.

96. The Teaching of Physics. (393) II; 3 cr. Mr. Steve.

97. The Teaching of Science. (319) I, II; 3-4 cr. 8 MWF. Mr. Davis.

158. Advanced Courses in Home Economics Education. (358, 190) I; 2 cr. Prerequisite: Graduate standing or teaching experience. 8 MW. Miss Henderson.

178. Advanced Course in the Teaching of English Literature. (191) II; 2-3 cr. A consideration of the problems of literary criticism and of the results of scientific studies as these apply to the teaching of reading and literature in the schools and the junior college. Not offered 1932-33.

179. Advanced Course in the Teaching of the English Language. (192) I; 2-3 cr. A consideration of the bearings of rhetorical theory, modern linguistic study, and psychology upon the teaching of composition in the schools and the junior college. Not offered 1932-33.

185. Advanced Course in the Teaching of History and the Social Studies. (350, 190) II; 2 cr. Prerequisite: Consent of instructor. 3:30-5:30 Tu. Mr. Phillips.

189. The Teaching of Speech in the Grades. II; 2-3 cr. A study of objectives and methods in speech education. Pre-school, kindergarten, grades 1-8. Practice teaching in Madison Public Schools. 1:30-3:30 M. Miss Borchers.

198. The Teaching of Speech in High School or College. (396) I; 2-3 cr. A study of the objectives and methods in speech education. 2:30-4:30 Th. Miss Borchers.

254. Advanced Course in the Teaching and Supervision of Home Economics. (290) II; 2 cr. Miss Henderson.

PHYSICAL EDUCATION—MEN

GUY SUMNER LOWMAN, B.Di., B.P.E., *Professor of Physical Education, Chairman*
JAMES CLAUDE ELSOM, M.D., *Professor of Physical Education*
THOMAS EDWARD JONES, B.A., B.P.E., *Professor of Physical Education*
ARPAD LOUIS MASLEY, G.G., *Associate Professor of Physical Education*
ROBERT NOHR, JR., G.G., *Associate Professor of Physcial Education*
JOSEPH CHRISTIAN STEINAUER, *Associate Professor of Physical Education*
GUY MERRILL SUNDT, B.S., *Associate Professor of Physical Education*
IRWIN CHARLES UTERITZ, B.A., *Associate Professor of Physical Education*
FRANK NICKERSON, *Assistant Professor of Physical Education*
GEORGE BALSER NELSON, Ph.B., *Instructor in Physical Education*
ARTHUR J. THOMSEN, B.S., *Instructor in Physical Education*
RUBE EDWIN WAGNER, B.S., *Instructor in Physical Education*

Courses 59, 159, and 164 may be elected for credit by students in the School of Education.

6. THEORY AND PRACTICE. I; 3 cr. History and principles of physical education and introductory physical training. Lab. fee $3.00. Staff.

7. THEORY AND PRACTICE. II; 3 cr. Tactics, calisthenics, and elementary apparatus; class instruction in minor sports and swimming. Lab. fee $3.00. Staff.

8. THEORY AND PRACTICE. I; 3 cr. Graded games, calisthenics, and nomenclature; football practice; basketball practice; minor sports. Lab. fee $3.00. Staff.

9. THEORY AND PRACTICE. II; 3 cr. Basketball theory; football theory; calisthenics, hand apparatus, and apparatus with methods of progression; track and field theory and practice; baseball practice. Lab. fee $3.00. Staff.

10. THEORY AND PRACTICE. I; 3 cr. Critic discussions; physical education for elementary and secondary schools, theory and practice; football practice; basketball practice; games of higher organization. Lab. fee $3.00. Staff.

11. THEORY AND PRACTICE. II; 3 cr. Physical education programs; baseball theory and practice; track and field practice; scoutcraft and camping. Lab. fee $3.00. Staff.

12. THEORY AND PRACTICE. I; 3 cr. Athletic conditioning and training; advanced basketball and football theory; practice teaching. Lab. fee $3.00. Staff.

13. THEORY AND PRACTICE. II; 3 cr. Advanced physical education programs; natural gymnastics, stunts, tumbling, and tests; advanced field and track theory; advanced baseball theory; life-saving and advanced swimming, practice teaching. Lab. fee $3.00. Staff.

NOTE: In exceptional cases, or in irregular schedules, Physical Education 6 to 13 inclusive may be offered for 2 or 4 credits, not to exceed a total of 24 credits for these theory and practice courses.

16. First Aid to the Injured. II; 1 cr. Discussion of accidents that may occur in the home, the gymnasium, the athletic field, etc. Methods of emergency treatment with actual practice. Latest methods of transportation of injured. Red Cross diploma in first aid is granted. 8 MW. Mr. Masley.

17. Athletic Training and First Aid. I; 2 cr. Open only to physical education minors. Mr. Fallon.

58. Human Mechanics. I; 2 cr. For men majoring or minoring in physical education. Prerequisite: Human anatomy. Mr. Nohr.

59. Nature, Function, and Organization of Play. I; 3 cr. Prerequisite: Psychology 1 or 3 credits in education. 10 MWF. Mr. Lowman.

71. Camp Administration and Scouting. II; 3 cr. Prerequisite: Physical Education 59 or three credits in education or sociology. Mr. Elsom, Mr. Thomsen.

80. Community Recreation. II; 2 cr. Prerequisite: Physical Education 59 or three credits in education or sociology. 1:30 MW. Mr. Elsom.

107. Effects of Physical Activities on the Body. II; 2 cr. Prerequisites: Physical Education 58, Physiology 3. Mr. Nohr.

118. Physical Examinations and Therapeutics. II; 3 cr. Prerequisites: Anatomy 39, Physiology 3. Mr. Elsom.

119. Physical Examinations and Therapeutics. I; 3 cr. Prerequisite: Physical Education 118. Mr. Elsom.

159. Social Aspects of Play and Recreation. I; 2 cr. Prerequisite: Physical Education 59. Mr. Lowman.

162. Tests and Measurements in Physical Education. I; 2 cr. Prerequisites: Physical Education 12, 13, 58, and 168 or Educ. Methods 70. Mr. Nohr.

164. School Health Problems. I; 2 cr. Prerequisites: Anatomy 39 or 120, Physiology 3 or 115, Physical Education 118-119 or 175-176 and a course in hygiene or health education. Mr. Elsom.

165. Physical Education for Elementary and Secondary Schools. I; 2 cr. Prerequisites: Physical Education 6 and 7. Mr. Nohr.

166. Electro-, Actino-, and Hydro-Therapy. II; 2-3 cr. The theory and physics of the agents used in physical therapeutics. Intended for students of physical education, nurses, and physio-therapy aides. Prerequisites: Physics, anatomy, and physiology. Mr. Elsom.

168. Organization and Administration of Physical Education. II; 2 cr. Prerequisites: Physical Education 10, 11, 12, and 59. Mr. Lowman.

263. Advanced Therapeutic Gymnastics. II; 2 cr. Especially qualified students may arrange for research in corrective gymnastics and physical therapy. Prerequisite: Physical Education 118 or 166. Mr. Elsom.

291. Problems in Organization, Teaching, and Adaptation. II; 2 cr. Prerequisite: Physical Education 168 or Educ. Methods 70. Mr. Lowman.

TEACHERS' COURSE

Teaching of Physical Education. See Educational Methods 70, page 384.

PHYSICAL EDUCATION—WOMEN

BLANCHE MATHILDE TRILLING, B.A., *Professor of Physical Education, Chairman*
GLADYS BARTON BASSETT, M.A., *Associate Professor of Physical Education*
KATHERINE L. CRONIN, M.A., *Associate Professor of Physical Education*
HELEN DOBSON DENNISTON, M.D., *Associate Professor of Physical Education*
RUTH GLASSOW, M.A., *Associate Professor of Physical Education*
MARGARET NEWELL H'DOUBLER, M.A., *Associate Professor of Physical Education*
HELEN I. DRIVER, B.A., *Instructor in Physical Education*
LOUISE F. GRAY, M.S., *Instructor in Physical Education*
MARY HARRINGTON, B.A., *Instructor in Physical Education*
KATHARINE MAPLE, M.S., *Instructor in Physical Education*
MARGARET MEYER, M.S., *Instructor in Physical Education*
ELNA MYGDAL, M.S., *Instructor in Physical Education*
CYNTHIA M. WESSON, M.A., *Instructor in Physical Education*

Starred (★) courses are open only to students majoring or minoring in physical education. Other courses are open to students in the School of Education (up to four credits) by consent of instructor.

★20. PRACTICE IN DANCING, GYMNASTICS, AND SPORTS. Yr; 0 cr. Includes instruction in nomenclature, elementary organization of materials, methods of leading sections and squads, and assisting in college classes. Staff.

31. PRINCIPLES OF COACHING. II; 2 cr. 9 MWF. Staff.

32. PRINCIPLES OF COACHING. I; 2 cr. 8 MW. Staff.

33. PRINCIPLES OF COACHING. II; 2 cr. 1:30 MW. Staff.

★41. THE SELECTION AND PRACTICE OF ACTIVITIES FOR ELEMENTARY AND SECONDARY SCHOOLS. II; 2 cr. Prerequisites: Physical Education 20, 42, 43 and 56. 1:30 MWF. Miss Cronin, Miss Glassow.

42. THEORY AND TECHNIQUE OF PLAYS AND GAMES. I; 2 cr. 10 MWF. Miss Cronin.

43. TECHNIQUE OF FOLK DANCING. II; 1 cr. 8 MW. Miss Bassett.

49. TECHNIQUE OF CLOGGING AND FOLK DANCING. I; 1 cr. Prerequisite Consent of instructor. 9 TTF. Miss Mygdal.

★56. KINESIOLOGY. I; 3 cr. Prerequisite: Anatomy 120. 1:30 MWF. Miss Glassow.

60. RHYTHMIC FORM AND ANALYSIS. I; 1 cr. Prerequisite: Major in Physical Education. 1:30 TT. Miss Mygdal.

81. CAMP LEADERSHIP. II; 2 cr. Prerequisite: Sophomore standing. Fee $2.00. 3:30 TT. Miss Gray.

130. TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION. I; 2 cr. Prerequisite: Consent of instructor. 8 TT. Miss Glassow.

146. THEORY AND PHILOSOPHY OF THE DANCE. I; 3 cr. Prerequisite: Senior standing and consent of instructor. 10 TT. Miss H'Doubler.

160. Advanced Rhythmic Form and Analysis. II; 2 cr. Prerequisite: Physical Education 60. 1:30 TT. Miss Mygdal.

★165. Dance Composition. II; 2 cr. Prerequisites: Physical Education 160 and 146. 9 TT. Miss H'Doubler.

★168. Organization and Administration of Physical Education. II; 2 cr. Prerequisite: Senior standing in physical education course. 1:30 MW. Miss Trilling.

★175. Therapeutic Gymnastics. I; 2 cr. Prerequisites: Anatomy 120, Physical Education 56. 1:30 TT, 2:30 F. Mrs. Denniston.

★176. Therapeutic Gymnastics. II; 2 cr. Prerequisite: Physical Education 175. 8 MW, 11 F. Mrs. Denniston.

★180. Topical Work. Yr; * cr. Staff.

198. Health Education. II; 2 cr. Prerequisite: Consent of instructor. Mrs. Denniston.

262. Research in Tests and Measurements. Yr; 2 cr. Prerequisite: Education 130. Miss Glassow.

★263. Advanced Therapeutic Gymnastics. I; 3 cr. Prerequisite: Physical Education 175-176. Laboratory work in Wisconsin General Hospital. 2:30 TT. Mrs. Denniston, Miss Lewis.

★265. Seminary in Dance Drama. II; 2 cr. Prerequisite: Physical Education 165. Miss H'Doubler.

★292. Seminary in Administration. Yr; 2 cr. Prerequisites: Physical Education 168, Educ. Methods 69. Miss Trilling.

TEACHERS' COURSE

The Teaching of Physical Education. See Educational Methods 69, page 384.

Other courses in physical education open to women are listed under Physical Education for Men: they include 16, 59, 71, 80, 159, 164, 166.

For courses in motor learning and physical development, see Educational Psychology, page 381; for courses in supervision, see page 379. See also bulletins of the School of Music and the Medical School for subjects required of physical education students.

PART VI—THE GRADUATE SCHOOL

C. S. Slichter, Dean

ORGANIZATION, AIMS, AND METHODS

The University of Wisconsin is a part of the system of public instruction provided by the State, but is open to all properly qualified students without regard to state lines. It is the aim of the University to offer opportunities for advanced instruction and research to as wide a constituency as possible. No limitations are placed upon a student's freedom in research and in the expression of his conclusions upon subjects which he is prepared to treat, but the University avoids all that is partisan in politics and sectarian in religion, without debarring its members from investigation and activity in any field.

The work of the Graduate School is under the general direction of the Graduate Faculty. The Dean of the Graduate School is charged with general supervision of all graduate students and is the medium of communication between such students and the university administration.

The Graduate School aims to serve the needs of men and women of college training or equivalent attainment who desire a larger and more thorough acquaintanceship with the scholarship and research of the world than can be obtained in the current undergraduate course.

In all departments of the Graduate School special emphasis is laid upon bringing the graduate student into contact with the research problems of his field of study. To this end able students share in the investigations of their instructors and are encouraged to acquire the spirit, as well as the methods, of productive work. Provision has been made by the University for the publication of the results of especially meritorious work of this kind and doctors' theses of more than common merit are often thus published.

Improved programs have been put in force for students entering the Graduate School in February for study during the second semester. Many persons find it possible to enter on leave of absence at that time, in some cases on full or part pay from their institutions. The Graduate School desires to facilitate plans of this kind and will be glad to cooperate in formulating and carrying them out.

ADMISSION

Admission to the Graduate School is based upon the undergraduate record. In order to avoid delays incident to the opening of the session, an applicant for admission should send to the Graduate Office several weeks in advance of his coming, a complete, official transcript of his undergraduate record and also of any graduate work he may have done. An official transcript from each school attended is necessary. Each record should be listed chronologically by semesters showing hours per week, weeks per semester, and grades received; and one record should include a notation of the high-school record. Transripts of students who register for graduate work become a permanent part of the university files and are not returned.

If the student's record shows the equivalent of the requirements for a bachelor's degree at the University of Wisconsin, he may be given full admission to the Graduate School. A minimum of 120 semester hours of college work is required, 75 of which shall be in strictly academic subjects outside of the major field. If a student falls short of meeting the requirement in subjects outside of his major, he may not be admitted until such deficiency is completely removed. Correspondence or extension work is not credited toward admission to the Graduate School unless it has been taken from the University of Wisconsin or from the institution at which the student was graduated.

Admission to the Graduate School does not of itself imply admission to candidacy for an advanced degree. Admission to candidacy is determined only after a student has shown that he is qualified to pursue graduate study successfully.

Graduates of the University of Wisconsin are admitted to the Graduate School if their records show an average of 1.25 grade-points per credit. Wisconsin graduates may obtain Permits to Register in the Graduate School by writing directly to the Graduate Office.

Seniors in the University of Wisconsin who are within six credits of graduation may be admitted to the Graduate School by obtaining a certified statement to that effect from the office of the Registrar.

Under certain conditions, a student in the College of Letters and Science who has completed his first four semesters at the University of Wisconsin with an average point-credit ratio of at least 2.5, may be permitted to pursue special studies with a view to being admitted to the Graduate School at the close of his seventh semester as a candidate for the master's degree in one additional semester. The detailed regulations are contained in the general announcement of the College of Letters and Science, page 63.

FEES AND EXPENSES

For detailed statement see section on Student Expense, beginning page 15.

Graduate students who have completed all the work for the doctor's degree except the oral examination, pay a fee of $10 only. There is an examination fee of $10 payable by all candidates for the master's degree.

In general, graduate students are required during the regular year to pay the same fees as are undergraduates, with the exception noted in the following table:

	General fee of $21.50 per sem.	Non-resident tuition fee $100 per sem.	Laboratory fees as listed	Examination Fees All Master's exams.—$10 Ph.D's not registered—$10 Ph.D's registered—none
Instructors and assistants	pay	exempt	pay	pay as specified above
Graduate fellows and scholars. Other persons specified on page 16	pay	exempt	pay	pay as specified above
Honorary fellows and scholars	pay only $9.50 (Infirmary and Union fees)	exempt	pay	pay as specified above

RESEARCH FUND

The State Legislature has provided the sum of $75,000 for the promotion of research in the University. The President of the University has appointed a University Research Committee to receive information concerning projects of research for which special aid is needed and for which adequate funds are not now available from any other source.

CLUBS AND SOCIETIES

To promote interest in problems of scholarship and investigation and for training in the presentation of results, numerous voluntary clubs and societies have been established by instructors and students in the Graduate School. Among these are Sigma Xi, Classical Club, Language and Literature Club, Historical Conference, Romance Language Club, Education Club, German Journal Club, Chemical Club, Biological Club, Mathematical Club, Mining Club, University of Wisconsin Branch of the American Institute of Electrical Engineers, Wisconsin Section of the American Chemical Society, University of Wisconsin Section of the American Electro-Chemical Society.

The Graduate Club, while sharing in these purposes, is primarily a social organization for the promotion of acquaintance and good fellowship among graduate students and members of the faculty.

The University Club, a local organization of college alumni, maintains a well-equipped clubhouse near the university grounds, and the privileges of this house, including its lodging and restaurant facilities, are open to men graduate students, who may become associate members of the club.

The College Women's Club maintains a clubhouse, at 12 East Gilman Street, where facilities are available to all women graduate students.

UNIVERSITY PUBLICATIONS

See page 7.

SUMMER SESSION WORK

There is a summer session of nine weeks in the Graduate School, especially designed to enable graduate students to make substantial progress toward a higher degree during the summer months. The time is sufficient for conducting graduate seminars and for carrying out important plans for study and reference in the various laboratories and libraries of the University.

The sessions and seminars are planned for the first four days of the week, leaving Friday and Saturday free for intensive library and laboratory work. Arrangements can also be made for extending the period of residence to ten, eleven, or twelve weeks if the student has already spent a period of actual residence in the Graduate School of the University of Wisconsin and if the written consent of the major professor is obtained. Application forms for extra-session registration may be obtained at the Graduate Office.

The nine-week session in the Graduate School is in addition to the general summer session of six weeks, which is open to undergraduate and graduates

Two courses pursued for nine weeks constitute full credit for the work of one-half semester. One six-week course and one nine-week course may also be offered for full credit, provided arrangement is made with the professor concerned for extra work during the last three weeks of the nine-week course. This permits any six-week graduate course to be associated with any nine-week course for full half-semester residence credit. No nine-week course, however, may be taken for the six weeks only. Two six-week courses constitute full residence for one-third of a semester.

See page 431 for statement of fees and expenses in the summer session.

FELLOWSHIPS AND SCHOLARSHIPS

UNIVERSITY FELLOWSHIPS

For the purpose of promoting higher scholarship and research the Regents of the University have established forty-eight university fellowships of the annual value of $750 each. These are allotted to the several departments of instruction as follows:

To the College of Letters and Science, twenty-seven, as follows: One each to botany, comparative literature, French, geology, German, Greek, Latin, mathematics, philosophy, physics, political science, psychology, Spanish, zoology; four each to economics and history; two to sociology; and three to chemistry. To the College of Agriculture, twelve, as follows: One each to agricultural bacteriology, agricultural chemistry, agricultural economics, plant pathology, genetics, and home economics; and six which are open to all departments in the College of Agriculture. To the College of Engineering, three. To the School of Education, three, as follows: one to the department of Education and two open to all departments in the School of Education.

In addition to the foregoing there are four fellowships open to all graduate students in the University, regardless of major field, and certain endowed fellowships specially described upon following pages.

The following are regulations respecting fellowships and scholarships:

1. With the exception of honorary fellows and honorary scholars, all university fellows and scholars are required to pay the general fee but are exempt from payment of the non-resident tuition fee.

2. Any fellowship to which the present regulations apply may be held by any graduate of a college of recognized standing or by anyone whose education is equivalent to that represented by a college degree. Those about to take such a degree are eligible candidates, the regulations applying to the time of entrance upon the duties of the fellowships. Men and women are equally eligible. Preference in appointment will usually be shown to candidates who possess a competent reading knowledge of French and German.

3. Fellowships will be granted only upon application, which should be made upon a special blank form furnished by the Dean of the Graduate School; such application, with accompanying evidence of merit, attainment, and ability, as shown by official transcripts of previous records and letters of recommendation, to be in the hands of the Chairman of the department to which appointment is desired before February 15 of the academic year preceding that during which the fellowship is to be held.

4. All fellowships will be filled each year. Fellows may be reappointed for one additional year only.

5. Application must be accompanied by evidence of scholarship, ability, and general worthiness, such as theses (whether prepared for this or other purposes), published writings, testimonials from instructors, outline of educational course pursued, special distinctions gained, and the like. Applications for reappointment should contain a full account of the work of the preceding year. Applications to receive attention must contain a definite statement of the special studies which the applicant intends to pursue.

6. Each fellow shall pursue his studies under the direction of an assigned professor or professors. Assignment of university services to the fellow shall be made by the head of the department to which the fellow has been assigned, and the work assigned may be equivalent to one hour of teaching daily.

7. Vacancies in fellowships, due to resignation or other cause, may be filled as they occur, at the option of the Faculty.

HONORARY FELLOWSHIPS

The Regents have established a limited number of honorary fellowships in the Graduate School; election is by the Graduate Committee upon recommendation of a graduate division or of a department. These awards may not be applied for, but are granted only upon recommendation of a department or division; they are restricted to persons who have already held academic honors, such as fellowships or teaching or research appointments, and to visiting professors from other institutions. During the year 1932-33 no honorary fellowships will be granted except to holders of the Doctor of Philosophy degree. No compensation is attached to these positions except the remission of non-resident tuition and a part of the general fee, and no teaching service is required; but to be eligible to an honorary fellowship one must be a graduate of at least one year's standing Honorary fellows are required to pay the infirmary and Union fees (see page 15).

THE LYMAN COPELAND DRAPER FELLOWSHIP IN WESTERN HISTORY

This fellowship, established in the University of Wisconsin by the Wisconsin Historical Society, is worth $500 a year, paid by the Historical Society. The incumbent gives service, as a calendarer of Draper manuscripts, to the amount of fifteen hours per school week.

THE HARRIET REMINGTON LAIRD FELLOWSHIP

By the will of the late John M. Olin the sum of $10,000 was bequeathed to the Regents of the University in trust, in memory of Harriet Remington Laird, sister of Mrs. Olin. The net income from this fund "shall, either yearly or biennially, as said Regents may determine, be used as a fellowship fund to be awarded to some woman graduate student selected by the Faculty of the University, such selection to be approved by said Regents."

THE ADAMS FELLOWSHIPS

By will, the late Charles Kendall Adams, formerly president of the University of Wisconsin, conveyed the larger part of his estate to the Regents of the University for the gradual establishment of fellowships in modern history, Greek, and English. There are now five of these fellowships. Each of these—the two Mary M. Adams Graduate Fellowships in English Language and Literature, the two President Adams Graduate Fellowships in Greek, and the President Adams Graduate Fellowship in Modern History—pays annually about $500.

THE ALBERT MARKHAM MEMORIAL GRADUATE TRAVELING FELLOWSHIP

In accordance with the terms of a bequest from the estate of the late Albert Markham, founder and principal of Markham Academy, Milwaukee, the Albert Markham Memorial Graduate Traveling Fellowship is offered annually in the departments of language and literature of the University of Wisconsin to holders of a Ph.D. degree, and is administered by a committee representing those departments. The annual income is approximately $800 but temporarily this may be increased to $1,000. The major work of the appointee must lie in one of the departments of language and literature. The fellow assigned is expected to devote the year to foreign travel and study in foreign universities, but by special permission may study at some other American university.

ANNIE GORHAM FELLOWSHIP

By will of the late Annie Gorham Marston, the sum of $10,000 was bequeathed to the Regents of the University of Wisconsin to be perpetually held in trust and the income therefrom to be used for the purpose of establishing and maintaining a fellowship in the University of Wisconsin for students doing graduate work. This fellowship is known as the Annie Gorham Fellowship and pays about $400 annually.

GRADUATE RESEARCH FELLOWSHIPS IN ENGINEERING

For the purpose of promoting engineering research and the development of qualified research men, the University of Wisconsin has established three research fellowships in the College of Engineering. These fellowships are granted under the following conditions:

Each fellow will be appointed for a period of two years, subject to satisfactory service. The salary will be $900 for the first year and $1100 for the second year. The fellow will be required to devote not less than half his time to assigned research work in the College of Engineering, but will in any case be given opportunity to complete his work for the M.S. degree within the two-year period. Candidates must be graduates of engineering colleges of recognized standing and should preferably have had one or two years' graduate study or teaching or engineering experience. The period of service required will be the usual academic year, including the short vacations.

SPECIAL FELLOWSHIPS IN ENGINEERING

The gas section, the electrical section, and the electric railway section of the Wisconsin Utilities Association each maintains a fellowship valued annually at $750-$1000, open to graduate students. Appointment to the gas fellowship is made by the Chemical Engineering Department, and to the electrical and electric railway fellowships by the Electrical Engineering Department.

In the Department of Mining and Metallurgy, cooperative fellowships are offered under grants from the Engineering Foundation, Wisconsin Steel Foundry

Research Foundation, and the Wisconsin Gray Iron Research Foundation. These fellowships carry stipends of $1,200 per year and in each case the fellow carries on research work on some special problem relating to the particular industry.

SPECIAL FELLOWSHIPS AND SCHOLARSHIPS IN GERMAN

A number of special fellowships and scholarships are available in the Department of German. From funds furnished by the National Teachers' Seminary in Milwaukee there is available the Milwaukee Seminary Traveling Fellowship for a year's study in Germany, the amount of which, according to individual needs, may be as high as $1,000. This fellowship is open to graduate students who have done distinguished work in the teacher-training courses of the department and who wish to prepare themselves further for the teaching of German.

The Julius Zehnter fellowship in German, established by the will of the late Julius Zehnter of Madison, affords the recipient a stipend at approximately $500, i.e., the annual income from an endowment fund of $10,000.

A German House Exchange Fellowship with a stipend of $500 from the Milwaukee Seminary Fund is open to a woman graduate student from Germany. The holder, who may major in any department, is to reside at the German House. Award of this fellowship is made by the Department of German on recommendation of the Akademischer Austauschdienst of Berlin.

WORKING FELLOWSHIPS

In certain departments of the state government provision is made for part-time service to be rendered by graduate students whose university studies are in related branches of economics or political science. These positions are filled through the State Bureau of Personnel to which application may be made for further information.

HOLLISTER FELLOWSHIP IN PHARMACY

Mr. and Mrs. Albert H. Hollister, late of Madison, by separate wills conveyed to the Regents of the University legacies, now amounting to $10,328, for the establishment and maintenance of a fellowship in pharmacy. The annual income of this sum is allotted to a graduate student upon the recommendation of the Department of Pharmacy.

OTHER FELLOWSHIPS AVAILABLE IN THE GRADUATE SCHOOL

The Fritzsche Brothers Fellowship in Pharmacy of the value of $500 is offered by the Fritzsche Brothers of New York. The holder of this fellowship is to do research work in plant chemistry with special reference to the Monardas and related problems.

The Newport Chemical Company provides a fellowship in pharmacy of the value of $1,000, the time of the appointee to be devoted to research work along the line of synthetic new remedies.

The Du Pont fellowship in chemistry of $750 is offered by E. I. du Pont de Nemours and Company of Wilmington, Delware.

The Menomonie River Sugar Company provides an industrial fellowship of the value of $700 a year.

The Wisconsin Utilities Association and the National Committee on the Relation of Electricity to Agriculture provide a fellowship in Agricultural Engineering. The value of the fellowship for the year was $2700.

UNIVERSITY SCHOLARSHIPS

The Regents of the University maintain twenty-two graduate scholarships of the value of $250 each. Two of these are designated for economics, one each for political science, sociology, European history, and American history, and two for agriculture. Appointments to these scholarships are made in the same manner as appointments to fellowships (see page 393). By special provision authority is conferred upon the faculties of Beloit, Carroll, Lawrence, Milton, Milwaukee-Downer, and Ripon to nominate annually to the faculty of the University of Wisconsin one member of their respective senior classes as a suitable candidate for a university scholarship. Such candidates when duly appointed by the Regents of the University are in all respects upon the same footing as other university scholars. In addition to these, there are eight scholarships open to students in all departments of the College of Letters and Science; appointments are made by the Graduate Committee upon recommendation of the various departments.

WISCONSIN SCHOLARSHIPS

There have recently been established in the Graduate School a number of so-called Wisconsin scholarships, available only to Wisconsin students who are candidates for the master's degree on the eight semester basis. Appointment is made for a period of three semesters, with a stipend of $450 for the period.

HONORARY SCHOLARSHIPS

The Regents of the University have established a limited number of honorary scholarships, which are awarded after careful examination into the worthiness of candidates, but only upon recommendation of a department, not upon individual application. Only those persons are eligible who have received the baccalaureate degree at least one year previous to their nomination. During the year 1932-33 no honorary scholarships will be granted except to holders of the Doctor of Philosophy degree. No compensation is attached to these appointments, but the holder of an honorary scholarship is exempt from payment of non-resident tuition fee and a part of the general fee. Honorary scholars are required to pay the infirmary and Union fees (see page 15).

WISCONSIN LEGISLATIVE SCHOLARSHIPS

There are available in the Graduate School to non-residents of this state, a number of so-called legislative scholarships, which exempt the recipient from payment of the non-resident tuition fee. The assignment of these scholarships is in the hands of a sub-committee of the Graduate Committee of the University. A candidate for one of these scholarships should apply to the Dean of the Graduate School for an application form and should submit to that office transcripts of his undergraduate record and of any graduate work already completed.

THE MARTHA L. EDWARDS MEMORIAL SCHOLARSHIP FUND IN HISTORY

The trustees, upon the recommendation of the Department of History, award small scholarships to women graduate students in history for the purpose of advancing their doctoral investigations. This fund was established in memory of the late Dr. Martha L. Edwards by members of her family and the Madison Branch of the American Association of University Women.

TRIPP SCHOLARSHIP

By will of the late J. Stephens Tripp of Sauk County there has been established a scholarship open to any University student, graduate or undergraduate, whose home is in Sauk County, Wisconsin. The awards are made in April or May for the following year, and the annual stipend is between $500 and $600.

OTHER SCHOLARSHIPS AVAILABLE IN THE GRADUATE SCHOOL

The Wisconsin chapter of Omicron Nu offers a yearly scholarship open to either graduate or undergraduate students in home economics. It returns from $200 to $250 a year.

The Anna Morris Ely Scholarship in economics carries an annual stipend of $250.

GRADUATE CLUB LOAN FUND

The graduate club has established a small loan fund for the use of graduate students in the last semester of their work toward the doctorate.

RESEARCH ASSISTANTSHIPS IN THE FOREST PRODUCTS LABORATORY

In accordance with the regulations of the United States Civil Service Commission, a limited number of students who show unusual ability in research may be appointed as student research assistants by the Forest Service and Bureau of Plant Industry. The entire time of the student is given to lecture or classwork in the University and to research in the Forest Products Laboratory. The salary varies from $200 to $480 a year and laboratory fees are remitted for work in the Forest Products Laboratory. The number of students thus appointed depends largely upon the funds available. Applications for these assistantships, accompanied by testimonials, should be sent to the Director of the Forest Products Laboratory, Madison, Wisconsin, before March 1 of the academic year preceding that during which such appointments are to be held.

SECOND DEGREES

NON-PROFESSIONAL DEGREES

The University of Wisconsin confers the following non-professional second degrees: Master of Arts, Master of Science, Master of Philosophy.

These degrees are conferred in accordance with the conditions set forth below upon graduates of the University of Wisconsin and upon graduates of other institutions of learning whose preliminary training has been substantially equivalent to that represented by the baccalaureate degrees of the University of Wisconsin. The University will determine this substantial equivalence of training by such methods as seem best adapted to each case, and may impose upon any candidate such additional requirements as seem needful and just, its judgment in this respect being influenced by the actual attainments of the candidate in larger measure than by the institution at which he has previously studied, and its purpose being to adjust the differences in the training furnished by different institutions.

The degree, Master of Arts, is conferred upon candidates whose undergraduate work corresponds to that now leading to the degree, Bachelor of Arts, as conferred by the University of Wisconsin, and whose graduate studies are non-professional in character. The degree, Master of Science, is conferred upon candidates whose undergraduate work corresponds to that now leading to the degree, Bachelor of Science, as conferred by the University of Wisconsin, and may also be conferred upon bachelors of arts who are adequately trained in mathematical, chemical, physical, or biological science. The degree, Master of Philosophy, is conferred upon candidates whose academic training corresponds to that leading to the degree, Bachelor of Philosophy, as conferred by the University of Wisconsin

Candidacy for the above degrees is based upon resident study at the University. In no case will a master's degree be conferred in course without the equivalent of two semesters of graduate study, at least one of which, or its equivalent in summer sessions, must be spent at the University of Wisconsin. No correspondence or extension work is credited toward an advanced degree at this University, except in special cases in the Department of Education.

The following regulations for the attainment of second degrees apply to all candidates in residence:

1. During a period of at least one academic year the candidate must pursue a course of graduate study characterized by definiteness of purpose and approved by the University as appropriate to that purpose and suitable in amount. At least half of the graduate work must lie in a single department. The undergraduate preparation of the candidate must be sufficient to satisfy the instructor that the advanced work may be profitably undertaken. Undergraduate courses of suitable character may be elected in addition to the normal amount of graduate work, provided that the recommendation of the professor in charge of the student's major and the approval of the Dean of the Graduate School be obtained in advance.

2. Students who, during their candidacy for a second degree, are engaged in teaching, or other remunerative employment, will be required to devote to their studies such period longer than one year as may be designated by the Graduate Committee.

3. The candidate must pass an oral examination upon the preliminary training and graduate work offered in support of his candidacy. Subject to the approval of the President of the University, the time and place of this examination will be determined and the examining committee appointed by the Dean of the Graduate School.

4. For students seeking to specialize in a definite line of study the preparation of a thesis may be required and, subject to the approval of the professor in charge, such thesis work may be elected by others. A thesis offered in partial fulfillment of the requirement for a master's degree must be typewritten and bound according to specifications furnished by the Librarian of the University, and before it is accepted must be approved by the Major Professor under whose guidance it has been done. It shall be deposited in the University Library by the second Friday before Commencement, and its title, as approved in advance by the Major Professor, will appear in the Commencement Register.

SECOND DEGREE IN PUBLIC HEALTH

The degree of Master of Public Health will be conferred upon graduates of approved medical colleges who satisfactorily complete one year of graduate work in sciences related to public health. For a detailed statement regarding this degree application may be made to the Dean of the Medical School.

SECOND DEGREE FOR STUDENTS IN PROFESSIONAL COLLEGES

Graduates of approved institutions who are regularly enrolled in the professional colleges of this University may supplement their professional studies by work taken in the Graduate School. Upon the completion of an approved course of study they will be admitted to examination for the master's degree, to be conferred at the time of their graduation.

DOCTOR OF PHILOSOPHY

I. The Degree. Doctor of Philosophy is a research degree. It is not a degree conferred solely as a result of study, no matter how faithful, extending over any prescribed period; it does not rest merely upon any computation of time or any enumeration of courses. Questions of residence and plans of study, listed below as the minimum, are secondary. The granting of the degree is based essentially upon evidence of general proficiency and of distinctive attainments in a special field, and particularly upon the recognized power of independent investigation as shown by the production of a thesis embodying original research or creative scholarship and presented with a fair degree of literary skill.

II. Residence. Candidacy for the degree is based upon resident graduate study normally extending over a period of not less than three academic years, at least one of which must be spent at this University. But it is to be understood that the mere completion of three years of resident study does not of itself confer a right to take the final examination. The matter of time is determined by the character of a student's undergraduate record and by the quality of the work done in the Graduate School.

One whose undergraduate work is insufficient in amount or too narrowly specialized must count on spending additional time in preliminary studies essential as a basis for the advanced work the student purposes undertaking.

Candidates who are engaged in teaching or in other remunerated employment will be required to devote to their candidacy such period in excess of the minimum requirement of three years as may be designated by the Graduate Committee. It is suggested as a very desirable consideration that every candidate for the degree should arrange to devote at least one year exclusively to graduate study.

Residence as a graduate student in another institution of approved standing will be accepted at the University, but residence elsewhere will not reduce the minimum of one year of residence in this University. In evaluating the time spent and work done elsewhere each case will be determined on its merits.

Work done *in absentia* in past years and credited for the degree of Master of Arts will not shorten the residence requirement for the degree of Doctor of Philosophy in case a student becomes a candidate for that degree. No *absentia* or correspondence work is now credited toward an advanced degree.

In order to give the work of a graduate student greater breadth, a student may be granted absence from the University to do special investigation in the field or to take advantage of opportunities for research in a special subject not to be found in the University. Such leave of absence is granted only in special cases and under definite limitations.

III. Languages. A reading knowledge of both French and German is required of all candidates. Certificates of ability to read French and German must be secured from the departments in this University and must be filed with the Dean of the Graduate School before the candidate is admitted to the preliminary examination. For detailed information and regulations touching the issuance of these certificates, students may apply to the Dean of the Graduate School.

The use of any other foreign language essential to the work of the major subject is in addition to French and German. No other language may be substituted for either French or German, and certificates of such reading knowledge from other institutions are not accepted at the University of Wisconsin. It is expected that a candidate should have a reading knowledge of at least one language, French or German, upon entrance to the Graduate School, and that he should prove his ability to read one of the two, if not both, by the end of the first year of graduate study.

IV. Plans of Study. The degree of Doctor of Philosophy is never granted for miscellaneous studies. The course as a whole must be rationally unified, and all constituent parts must contribute to some general object of study and research. The course must be selected from groups embracing one principal subject, called the Major, and one or two subsidiary and cognate branches, called the Minor.

Major Study. A candidate is required to select a field of study which may be co-extensive with the work of a single department, or with one of the "subjects" under which certain departmental plans of courses are arranged, or which may be constructed from two closely interrelated subjects. Only in the exceptional case will a Major be allowed to extend beyond a single department and then only with the prior approval of the Dean.

Minor Studies. In order to obviate overspecialization, a candidate is required to pursue one, and may pursue two, minor studies lying outside the major subject but cognate with it. The relation of the subsidiary subjects to the principal and the number of them depends largely on the character of the course as a whole and the general attainments of the candidate. In general the Minor shall aggregate from a fourth to a third of the time devoted to graduate study.

MAJOR PROFESSOR. One of the instructors in the department of the Major is selected by the student as his Major Professor. The candidate will consult the Major Professor in the selection and arrangement of a program of work embracing both the major and minor fields. The Major Professor will have immediate supervision of the thesis. The candidate should consult with the Major Professor at suitable intervals. It is one of the unique advantages of graduate life that a student comes into freedom of association with older scholars who will seek to make his work profitable by counsel and assistance and who will aid the student in acquiring for himself the discipline and method of independent scholarship.

DEPARTMENTS AND DIVISIONS. The work of the Graduate School as a whole is organized not only according to departments, but also according to divisions, each of which includes allied departments. The requirements fixed by a department or a division cannot be stated in terms at once specific and uniform. Information about the special requirements of departments or divisions is to be found in their separate announcements.

V. ADMISSION TO CANDIDACY. A student is not permitted to take the final examination for the degree until he has been formally admitted to candidacy by passing a preliminary qualifying test. The preliminary examination must be taken not less than one academic year in advance of the date when the degree is expected to be conferred. Exceptions to this rule may be made in individual cases upon recommendation of a division to the Graduate Committee; and for the students who come to Wisconsin for their last year of graduate work, arrangements will be made whereby the preliminary examination can be taken in the early part of the academic year.

When the preliminary examinations have been taken the candidate shall file with the Dean a formal application to be admitted to candidacy for the doctor's degree. A blank form suitable for the purpose is furnished by the Graduate Office and this formal application should embrace the following statements: (a) Departmental recommendations of candidacy based upon a formal written examination, or an oral examination before a duly appointed committee, or such other substantial test as the departments may elect. The nature of the test shall be stated in the recommendations. (b) The scope of the proposed minors with the approval of the professor who assumes charge of each minor.. (c) The title of the proposed thesis (subject to future verbal change) approved by the Major Professor. (d) Certification that the French and German requirements have been met.

This application shall be submitted to the Graduate Committee, which may reject it for cause, or may approve it and admit the student to candidacy. With reference to time requirements imposed by the University, the Graduate Committee may specify the earliest permissible date for the final oral examination.

VI. FINAL EXAMINATION. The degree Doctor of Philosophy is not granted for faithful study for a prescribed time or in fulfillment of a definite program, but on the ground of long study and distinct attainment in a special branch of knowledge manifested by a final examination and by the presentation of a thesis which gives evidence of original treatment of a fitting subject and forms a contribution to knowledge.

ORAL EXAMINATION. Every candidate for the doctor's degree is subject to an oral examination upon the thesis and the general field of the major and minor studies, but the preliminary examination may be construed as final in certain aspects of the major and minor subjects if the professors in charge of the candidate's work are satisfied with his preparation. Such delimitation of the subjects to be offered in the final oral examination must be made a matter of record with the Dean of the Graduate School.

The Dean of the Graduate School will appoint for each candidate an examining committee, usually composed of five persons, with the Major Professor as chairman, and will designate a time and place for the examination. The candidate's completed thesis shall be presented to this committee, or in lieu thereof, the Major Professor shall state to the committee its purpose and scope and shall certify to the committee that the work upon the thesis is substantially completed. This examination shall be open to all members of the Graduate Faculty.

VII. THESIS. At any time after admission to candidacy, and at least thirty days prior to the final examination, the candidate must submit to the Dean of the Graduate School, for approval of its mechanical form and execution, two typewritten copies of his completed thesis—one original and one duplicate copy. The Dean will furnish an official title page for the thesis and appoint a committee of three consisting of the Major Professor and two members of the Graduate Faculty, to pass upon its substantial merit. Their report, if favorable, shall be endorsed upon the official title page. When so endorsed, the thesis shall be brought to the Graduate Office for recording and then filed in the University Library. The thesis can be withdrawn from the Library only upon written authorization of the Dean of the Graduate School. In case of divided opinion among the examiners, the case shall be referred to the Graduate Committee with right of appeal to the Graduate Faculty.

ABSTRACT. After the approval of the thesis, the candidate shall file with the Dean of the Graduate School either an abstract of the thesis, or a selected part thereof, certified by the Major Professor to be adequate for publication in lieu of the complete thesis.

SECURITY FOR PUBLICATION. After filing such abstract or selected part the candidates shall place with the cashier of the University the sum of fifty dollars as a guaranty of prompt publication of his thesis. The sum so placed shall be held in trust by the cashier for a period of not less than one year and shall be refunded to the candidate if during such period he shall deliver to the University Librarian the printed copies of his thesis as prescribed below. At the expiration of the period thus described, the Dean of the Graduate School may declare such fifty dollars to be forfeited to the fund for the publication of thesis abstracts.

The successful candidate is urged to put his thesis into print as promptly as possible. In the case of doctors' theses published in (a) such scholarly periodicals or society or university publications as shall be approved by the Dean of the Graduate School, or (b) in bound volumes issued and sold by well-known publishing houses approved by the Dean, the candidate may deposit in the University Library six copies of the thesis so published to obtain the refund of his thesis deposit. By approval of the Major Professor and the Dean of the Graduate School, publication and filing of an approved part of the thesis may be accepted in satisfaction of this requirement.

PART VII—EXTENSION DIVISION

(EXTRA-MURAL COLLEGE)

C. D. Snell, Dean
M. G. Little, Assistant Dean

Of the three main functions of a commonwealth university—(1) resident instruction, (2) research, and (3) the dissemination of the useful and assimilable knowledge which has been accumulated through productive scholarship, to all classes of citizens and in forms adapted to their requirements—the third is fulfilled in an organized way by the Extension Division.

This Division constitutes the extra-mural college of the University, and is therefore one of the seven coordinate divisions of the University with a dean and a faculty. The work of the Division is divided into three departments as follows: Extension Teaching, Debating and Public Discussion, Public Service.

The object of this University in carrying on extension work is to provide the highest type of intellectual stimulus and continuing education feasible for the citizens of the commonwealth who are unable to attend established educational institutions, and to give every one in the state the opportunity to obtain the highest education possible at the smallest practicable expense—to bring the University and the home into close relationship.

DEPARTMENT OF EXTENSION TEACHING

William Henry Lighty, Ph.B., Director

Arthur Beatty, Ph.D., *Professor of English*
Benjamin George Elliott, M.S., M.E., *Professor of Mechanical Engineering*
Henry Rowland English, M.A., *Professor of Business Administration*
Cyril Methodius Jansky, B.A., B.S., *Professor of Electrical Engineering*
Harry E. Pulver, C.E., *Professor of Civil Engineering*
Edward Bunker Schlatter, Ph.D., *Professor of Romance Languages*
Lelia Bascom, M.A., *Associate Professor of English*
Roy Jefferson Colbert, Ph.D., *Associate Professor of Economics and Sociology*
Richard Everett Ellingwood, M.S., *Associate Professor of Business Administration*
Adolphine Bianca Ernst, Ph.D., *Associate Professor of German*
Ford Herbert MacGregor, M.A., *Associate Professor of Political Science*
Ann Maria Pitman, Ph.D., *Associate Professor of Classics*
Clinton De Wayne Case, B.S., *Assistant Professor of Mechanical Engineering*
Frank Dougall Crane, Ph.D., *Assistant Professor of English*
Charles Lyman Dean, M.E., *Assistant Professor of Mechanical Engineering*
Helmuth Reinhold Doering, B.A., M.B.A., *Assistant Professor of Business Administration*
Bessie Eva Edsall, Ph.M., *Assistant Professor of History*
Russell Winslow Fowler, M.S., *Assistant Professor of Drawing*
Ida Marie Gangstad, B.A., *Assistant Professor of Library Methods*
Harriette Grace Holt, M.A., *Assistant Professor of Mathematics*
Mrs. Edith Evans Hoyt, M.A., *Assistant Professor of Education*
Thomas Leroy Martin, M.B.A., C.P.A., *Assistant Professor of Accounting*
Mrs. Amy Hoyt Smith, M.A., *Recorder*

WILLIAM AUGUSTUS CORNELL, M.A., *Instructor in Sociology*
ALBERT ERNEST CROFT, M.A., *Instructor in Economics and Sociology*
LEONARD FOLSOM HILLIS, B.S., *Instructor in Civil and Structural Engineering*
MRS. BERNICE DONNELLY KUNEY, M.A., *Instructor in English*
RALPH ALAN MCCANSE, M.A., *Instructor in English*
JOHN LESTER MILLER, Ph.M., *Instructor in Economics*
KATHERINE MARIE TUFTS, M.A., *Instructor in Spanish*
DAVID MICHAEL REIN, M.A., *Assistant in English*

CORRESPONDENCE STUDY

For the needs of those who are unable to adjust themselves to the formal system of education, special forms of consecutive home-study courses have been developed by the Department of Extension Teaching. This department offers individual instruction adapted to the special needs of students who cannot come into residence study at the University. The instruction given may be undertaken in the leisure hours of each student at his own home.

PLAN AND SCOPE

The University of Wisconsin provides, through the Department of Extension Teaching, non-resident or home-study instruction by correspondence, as follows:

1. Certain regular university studies which may, under approved conditions, be taken for credit toward a degree.

2. Advanced courses designed to help persons—graduates and others—in professional or practical life to keep in touch with the advancement in science and in other fields of knowledge.

3. High-school and preparatory studies for those to whom the conventional institutions are not available or practicable.

4. Elementary and grammar school studies for those who require such instruction for practical purposes.

5. Vocational courses prepared with reference to the needs and requirements of given occupations.

6. Guided study outlines for program material to aid various organizations in their associated or club or group study and discussion work.

GENERAL BENEFITS

Persons who are benefited by correspondence study may be divided into two main classes: (1) those who have the taste, ability, and inclination to continue their education, whether general or vocational, (2) wage-earners who cannot leave their employment in order to acquire training directed toward greater proficiency and skill.

The first class may be roughly divided into (1) those who wish to keep abreast of the advances in knowledge related to their profession or business, or who wish to study purely for purposes of general culture and the enjoyment of the intellectual pleasures that accompany the sense of mastery of knowledge and the getting of understanding, (2) those who wish to earn units of credit toward a university degree, and (3) those who require preparation for entrance to the University.

The second class includes (1) those whom the necessity of earning a livelihood has taken from school before acquiring a satisfactory elementary education; (2) those who have had the benefit of more or less liberal educational opportunities but have received no training especially adapted to fit them for their chosen vocations; and (3) those who desire to change vocations and prepare themselves for employment more nearly adapted to their tastes and abilities.

All courses offered through correspondence study, whether taken for university credit, or not, are on a uniform basis in reference to the amount of work covered. Courses which are satisfactorily completed have, therefore, a definite value, and all students who successfully complete such courses will be awarded statements or certificates indicative of the character of the work done.

METHOD

PROCEDURE. The student who wishes to undertake correspondence study should first select such course or courses as he may desire to take. He should then fill out the application blank with information called for, and return it, with the required fee, to the office of the Extension Division. The necessary textbooks, outfits, etc., may also be purchased through the Extension Division if the student so desires. Ordering texts through the Extension Division at the time of registration saves time and facilitates a prompt start. Students are encouraged to register for but one course at a time. Not more than two courses may be registered for at one time unless the student can give evidence that he has at least several hours each day to devote to study.

THE INSTRUCTION. Upon receipt of the application and fee, the first two assignments will be sent with instructions for study, methods of preparation, and directions for returning recitation sheets and reports. Each recitation report will be returned to the student with such corrections, explanations, and suggestions as may be needed. Lists of books, assignments for reading, and all necessary assistance will be furnished throughout the course, so that no student will be left without adequate aid and guidance. Questions on the subject in hand are at all times encouraged.

BY WHOM PREPARED. These courses are prepared by the members of the university faculty, and each represents a definite amount of work equivalent to similar work done in residence at the University, or in schools of known standards.

THE UNIT COURSE. The unit course is divided, where practicable, into forty weekly assignments. Such a course represents at least an amount of work equal to that done in residence at the University in a study of five recitation hours a week for one semester or half year. It is assumed that this work may be done by the average student in forty weeks on a minimum leisure for study of one hour a day, six days in the week. It is, however, the student's privilege to pursue his studies as rapidly as may be consistent with good work and the rules of the University.

THE LESSON ASSIGNMENT. The unit course is divided into assignments. In some courses this may call for but a single report, but in others the assignment may be divided into two or more lessons. In all cases the assignment represents an average week's work, and not an evening's work as at school.

PERMANENCE. The department endeavors to make its work thorough and permanent, and the various courses have been arranged, wherever that is desirable, in coordination with the regular residence work, the short courses, and the summer session.

EXAMINATIONS. Examinations are optional with the student, but are required where credits or certificates are sought. These examinations must be taken at the University, or under supervised conditions approved by the University.

REGULATIONS. 1. Students may begin correspondence-study courses at any time during the year.

2. For admission to a correspondence-study course no preliminary examination is required. The student is required to fill out an application blank, giving such information as may be helpful to the instructor in adapting the instruction to his personal needs.

3. Students who undertake correspondence-study work for university credit must state this fact in advance and comply with all the requirements of the University.

4. For the benefit of the department it is desired that the applicant state fully the purpose he has in view in taking the work and also in detail such educational advantages, training, or experience as he may have had. The department endeavors to meet the needs of the individual student by advice and suggestion, as well as by formal instruction, but whenever it finds that the course elected is not for the best interest of the student, it reserves the right to reject the application, or to advise a change to another course.

5. The time in which a correspondence-study course is to be completed varies with the length of the course. One year is allowed for a course of twenty-four assignments or less, fifteen months for a course of from twenty-five to thirty-two assignments, and eighteen months for a course of from thirty-three to forty assignments. A reinstatement fee is charged when courses are not completed within the time limit allowed.

6. All fees are payable in advance, and no fee is refunded because a student fails to start or pursue the course for which he has once registered. If an application for instruction is rejected, the fee remitted will be returned.

7. The fee for university credit courses is five dollars per credit for students who are legal residents of the state of Wisconsin. For students not legal residents of the state of Wisconsin, the fee is eight dollars per credit. For courses not involving university credit, corresponding fees prevail. The expense connected with the instruction of each course is listed in the bulletins where these courses are announced. These fees are deliberately put upon the lowest operating basis.

LABORATORY WORK

Provision is made in connection with many correspondence courses, both in the advanced grade and in the vocational studies, by which laboratory practice forms a part of the instruction. In some courses laboratory outfits are sent to the student from the University to be set up in his own home. In other cases special arrangements are made for short periods of laboratory practice at Madison. In some studies local branch laboratories are established where local students may receive special instruction as the correspondence course proceeds.

UNIVERSITY CREDIT

1. Persons who have had the required preparation for admission to the University will, upon the satisfactory completion of a correspondence-study course designed for credit, have their grades permanently filed in the Recorder's office until the student has satisfactorily completed one year of study in residence. When all the requirements are satisfied, the correspondence-study records may be transferred to the Registrar's office and applied toward graduation.

2. The maximum credit granted for work done by correspondence study, however, may not exceed one-half the number of credit hours required for graduation.

3. At the completion of each correspondence-study course for university credit, the student shall pass an examination held under the direction of the instructor giving such course, or supervised by some one designated by the University for that purpose.

4. Students carrying correspondence courses for credit should, upon enrolling for residence work in any institution of higher learning, consult the proper authorities in such institution before proceeding with correspondence study.

5. In special cases credit may be allowed for correspondence-study courses of preparatory grade to satisfy partial entrance requirements to the University.

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
BOTANY						
1	Description and classification of flowering plants	16 or 32	2 or 4	$10 or $20	$16 or $32	130
11	General botany	40	5	25	40	1
5	Plant histology	24	3	15	24	110
7	Drug and food products	24	3	15	24	111
8	Trees and shrubs	16 or 24	2 or 3	10 or 15	16 or 24	131
21	Elementary botany	32		20	32	
BUSINESS						
128	Bookkeeping and introd. account. I	12		10	15	
129	Bookkeeping and introd. account. II	12		10	15	
138	Accounting principles and practice I	12		10	15	
139	Accounting principles and practice II	12		10	15	
136	Cost accounting I	12		10	15	
140	Cost accounting II	12		10	15	
135A	Advanced accounting problems I	12		15	20	
135B	Advanced accounting problems II	12		15	20	
134	Governmental accounting	10		10	12	
132A	Federal income tax	16		15	20	
137	Auditing	16		16	20	
115	Contracts, law of	10		10	15	
118	Sales, law of	10		10	15	
122	Commercial paper, law of	10		10	15	
124	Private corporations, law of	7		5	8	
5	Show-card writing	10		10	15	
159A	Retail selling	16		10	12.50	
159B	Retail store management	12		10	15	
154	Advertising procedure	16		15	20	
191A	Retail advertising	16		15	20	
102	Business correspondence I	8		7.50	10	
103	Business correspondence II	8		7.50	10	
169	Investment principles	12		15	20	
186	Practical banking	11		10	15	
CHEMISTRY						
1A	Elementary chemistry	40	5	25	40	1a
1B	Qualitative chemical analysis	40	5	25	40	1b
117	Advanced general chemistry	32	4	20	32	117
DRAWING						
203	Shop sketching	16		10.75	16.75	
203S	Freehand industrial sketching	16		10.25	16.25	
204A	Shop drawing	20		16	21	
204B	Advanced shop drawing	20		15	20	
205	Sheet metal drafting	10		10.25	12.25	
206S	Elements of graphic statics	10		8.75	11.25	
243A	Principles of architectural drawing	16		10	16	
243B	Advanced architectural drawing	10		10	16	
1	Elements of drawing	24	3	15	24	1
2	Elements of drawing	24	3	15	24	2
3	Descriptive geometry	24	3	15	24	3
4	Freehand lettering	16	2	10	16	7
5	Show-card writing	10		10	15	
4A	Engineering lettering	6		5	8	

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
ECONOMICS						
1A	General economics	32	4	20	32	1a
1B	General economics	32	4	20	32	1b
122	Labor problems	24	3	15	24	122
135	Railway transportation	24	3	15	24	135
5	Money and banking	24	3	15	24	5
50	Practical economics	16		10	16	
EDUCATION						
11A	Mental development and education	16	2	10	16	11
11B	Mental development and education	24	3	15	24	11
41	Educational psychology	24	3	15	24	41
101	History of modern European education	24	3	15	24	101
20A	The teaching of language in the intermediate and grammar grades and in the rural schools	16	2	10	16	
20B	The teaching of literature and reading in the elementary and rural schools	16	2	10	16	
31A	Principles of education	24	3	15	24	31
31	Principles of secondary education	24	3	15	24	31
112A	Social development and education	16	2	10	16	112
112B	Social development and education	24	3	15	24	112
143	Psychology of individual differences and the measurement of intelligence	24	3	15	24	143
144	Psychology of learning	24	3	15	24	144
103	History of American education	24	3	15	24	103
193	Introduction to educational supervision	16	2	10	16	193
137	Educational tests	16	2	10	16	137
152	Principles of vocational and practical arts education	16	2	10	16	152
196	Advanced problems in the supervision of industrial education	16	2	10	16	196
180	Principles of educational and vocational guidance	16	2	10	16	180
181	Vocational guidance and counseling techniques	16	2	10	16	181
ENGINEERING—CIVIL AND STRUCTURAL						
404	Civil and structural engineering drawing	12		8	12	
408	Essentials of structural theory Part A	16		10	16	
409	Essentials of structural theory Part B	16		10	16	
410	Roof trusses	12		7.50	12	
411	Plate girders	12		7.50	12	
412A	Bridge stresses—uniform loads	16		10	16	
412B	Bridge stresses—concentrated loads	16		10	16	
413	Design of railway bridge trusses	16		10	16	
418A	Reinforced concrete construction	16		10	16	
418B	Reinforced concrete construction	24		15	24	
418C	Reinforced concrete construction	24		15	24	
421	Steel building construction	16		10	16	
430	Practical course in concrete	12		8	12	

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
431	Structural steel drafting and elementary design					
	Part A—Structural steel drafting	6		4	6	
	Part B—Fundamentals of design	10		7	10	
	Part C—Steel designing and detailing	8		7	10	
472	Materials of construction	12		8	12	
441A	Elementary surveying	10		7	10	
441B	Advanced surveying	10		7	10	
442	Highway surveying	12		8	12	
481	Practical hydraulics	14		10	14	
482	Practical hydraulics	10		7	10	
483	Advanced hydraulics	8		5	8	
445	Railway curves	12		10	16	
501	Roads and pavements	16		10	16	
1	Railway engineering	12	2†	10	16	Ry. 1
2	Hydraulics	24	3	15	24	Hyd. 2
115	Hydraulics	8	1	5	8	Hyd. 115
2	Stresses in simple structures	32	4	20	32	Str. 2
3	Design of roof trusses and plate girders	24	3	15	24	Str. 3
4	Design of railway bridge trusses	16	2	10	16	Str. 4
105	Principles of reinforced concrete	24	3	15	24	Str. 105
106	Concrete arches	16	2	10	16	Str. 106
111	Reinforced concrete construction	16	2	10	16	Str. 111
1T	Surveying	8	1	5	8	T. E. 1
2T	Surveying	8	1	5	8	T. E. 2
3T	Surveying	12	1½	7.50	12	T. E. 3
104T	Surveying	12	1½	7.50	12	T. E. 104
108T	General surveying	16	2	10	16	T. E. 108
ENGINEERING—ELECTRICAL						
301	Mathematics, Part I	26		15	20	
	Mathematics, Part II	14		10	12	
310	Elementary magnetism and electricity	20		12	20	
311	Theory and operation of direct-current machinery	20		12	20	
312	Theory of alternating currents	20		12	20	
313	Alternating-current machinery	20		12	20	
314	Electric lamps and illumination	20		12	20	
315	Practical alternating currents	20		12	20	
316	Central electric stations	20		12	20	
317	Electric power transmission	24	3	15	24	137 in pt.
318	Telephony—Subscriber's apparatus	10		6	10	
319	Commercial electrical measuring instruments	24		15	24	
319A	Watthour meters	12		8	12	
322	Storage batteries	14		10	14	
323	Electric central station distribution systems	20		15	20	
324	Electric wiring	20		12	20	
327	Essentials of electricity	20		12	15	
328	Practical radio	20		10	16	
330	Electrical engineering mathematics	30	3	20	30	††
340	Fundamentals of electrical engineering	32	4	20	32	1

†After completion of field work requirements.
††Equivalent arranged by instructor.

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
341	Principles of direct-current machines	32	4	20	32	2
343	Principles of alternating currents	32	4	20	32	3
344	Principles of alternating-current machinery	32	4	20	32	4
346	Electric circuits and transient electric phenomena	16	2	10	16	232
ENGINEERING—MECHANICAL						
75	The operation and application of the slide rule	5		6	9	
201A	Shop arithmetic	20		11	21	
201B	Advanced shop mathematics	20		11	21	
206	Elements of mechanics	20		17.25	22.25	
207	Strength of materials	24		15	24	
208	Mechanism	12		10	15	
1	Machine design	32	4	20	32	M. D. 1
209	Elementary machine design	16		15	20	
214	Elementary steam engineering	16		10	20	
215	Heat	16		10	16	
230A	Heat power engineering	32	4	20	32	S. and G. 1
230B	Heat power engineering	32	4	20	32	S. and G. 2
216	Steam boilers	24		15	24	
217	Steam engines	20		15	20	
218	Aeronautics	24		15	24	
218C	Meteorology and air navigation	16		15	20	
222	Refrigeration	20	3	15	20	S. and G. 112
223	Heating and ventilating	24	3	15	24	S. and G. 108
230A	Heat power engineering	32	4	20	32	
230B	Heat power engineering	32	4	20	32	
235	Elementary plumbing	20		16	20	
241	Carpenters' and builders' arithmetic	16		11.75	16.75	
242	The properties and uses of wood	12		10	15	
242A	Kiln drying of lumber	10		10	15	
272	Cupola practice	7		5	10	
274	Foundry metallurgy	9		10	15	
ENGLISH AND COMPARATIVE LITERATURE						
1	Elementary English	24		12	24	
	Part A	12		6	12	
	Part B	12		6	12	
61	English grammar	24		12	15	
2	Intermediate English composition	40		24	30	
	Part A	20		12	15	
	Part B	20		12	15	
64	Practical English review	10		5	10	
65	First-year high-school English	40		25	30	
66	Second-year high-school English	40		25	30	
67	Third-year high-school English	40		25	30	
5	English composition	24	3	15	24	1a
6	English composition	24	3	15	24	1b
8	Composition of technical papers	16	2	10	16	
8A	Composition of technical papers	8		5	8	
7A	Advanced composition	16	2	10	16	2a
7B	Advanced composition	16	2	10	16	2b
16A	The short story	24	3	15	24	149
16B	The short story	24	3	15	24	149
51	General survey of English literature	24	3	15	24	30a

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
52	General survey of English literature	24	3	15	24	30b
33A	Introduction to English literature	16	2	10	16	33a
33B	Introduction to English literature	16	2	10	16	33b
34	The Romantic movement	24	3	15	24	34
ENGLISH AND COMPARATIVE LITERATURE (Cont.)						
17A	Shakespeare	24	3	15	24	137(I)†
17B	Shakespeare	24	3	15	24	137(II)††
18	The poetry of Tennyson	16	2	10	16	141
19	The poetry of Browning	16	2	10	16	145
25	The English novel in the nineteenth century	24	3	15	24	39 in part
40A	Survey of American literature	16	2	10	16	40
40B	Survey of American literature	16	2	10	16	41
4A	The teaching of composition	16	2	10	16	
4B	Teaching of reading and literature	16	2	10	16	
20A	The teaching of language in the intermediate and grammar grades and in the rural schools	16	2	10	16	
20B	The teaching of literature and reading in the elementary and rural schools	16	2	10	16	
85A	Modern drama	16	2	10	16	Comp. Lit. 67
85B	Modern drama	16	2	10	16	Comp. Lit. 67
113	Ancient classical drama in English	16 or 24	2 or 3	10 or 15	16 or 24	
118	Classical mythology in literature	16	2	10	16	
68A	Modern novel	16	2	10	16	Comp. Lit. 68
68B	Modern novel	16	2	10	16	Comp. Lit. 68
FRENCH						
1	Elementary French	32	4	20	32	1a
2	Elementary French	32	4	20	32	1b
3	Intermediate French	24	3	15	24	10a
4	Intermediate French	24	3	15	24	10b
6A	Elementary composition	16	2	10	16	15
6B	Intermediate composition	16	2	10	16	16
7A	Advanced composition	16	2	10	16	127 or 124
8	Modern French dramatists	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	123
9	Modern French novelists	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	136
10	General survey of French literature	24	3	15	24	131
20	Advanced reading	16 or 24	2 or 3	10 or 15	16 or 24	20 a or b
21	Elementary survey	24	3	15	24	21a
22	Elementary survey	24	3	15	24	21b
GEOLOGY AND GEOGRAPHY						
3	Physiography	24 or 40	3 or 5	15 or 25	24 or 40	3 cr.—5 5 cr.—1
4	General geology	24	3	15	24	Geol. 2
6	Commercial geography	24	3	15	24	6
16	Geography of Europe	24	3	15	24	101
GERMAN						
1A	First-semester German	32	4	20	32	1a
1B	Second-semester German	32	4	20	32	1b
2	Elementary German review	16	2	10	16	
2A	Third-semester German	32	4	20	32	2a
2B	Fourth-semester German	32	4	20	32	2b
19	Scientific German	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	19

†37(I) for juniors.

††37 (II) for juniors.

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
GERMAN (Cont.)						
16	Prose reading for graduates	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	16
10	German grammar review	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	10
80	Elementary teachers' course	8		5	8	
83	The teaching of German	16 or 32	2 or 4	10 or 20	16 or 32	83
17	Modern German drama	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	17
18	Modern German novel	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	18
20	Schiller	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	20
25	Goethe	16, 24, 32	2, 3, 4	10, 15, 20	16, 24, 32	25
130	Goethe's Faust	24 or 48	3 or 6	15 or 30	24 or 48	130
131	Survey of German literature	48	6	30	48	131
	Part A	24	3	15	24	
	Part B	24	3	15	24	
150	History of the German language	16	2	10	16	150
GREEK						
1	Elementary Greek	40	5	25	30	1
1A	Elementary Greek—Pharr's Homeric Greek	32	4	20	25	1
7	Xenophon's Anabasis	24	3	15	20	7(I)
7A	Reading course in Herodotus	24	3	15	20	7(II)
3	Homer: The Iliad	24	3	15	20	10
6	Advanced prose composition	16 to 30	2 or 4	10 or 20	16 or 32	110
5	Elementary composition	16	2	10	16	
106	Aeschylus: The Agamemnon	16	2	10	16	106
113	Ancient classical drama in English	16 or 24	2 or 3	10 or 15	16 or 24	
118	Classical mythology in literature	16	2	10	16	
HEALTH						
6	Prevention of disease and home care of the sick	8		4	8	
HISTORY						
51	United States history	20		10	15	
52	United States history	20		10	15	
87	Modern European history	16		10	15	
88	Modern European history	16		10	15	
4A	History of the United States 1760-1830	24	3	15	24	4a
4B	History of the United States 1830-1877	24	3	15	24	4b
5A	English history	24	3	15	24	5a
5B	English history	24	3	15	24	5b
2A	Modern European history	24	3	15	24	2(I)
2B	Modern European history	24	3	15	24	2(II)
139A	Europe since 1815, Part I	24	3	15	24	139
10A	Ancient History	24	3	15	24	10(I)
10B	Ancient History	24	3	15	24	10(II)
1A	Medieval history	24	3	15	24	1(I)
1B	Medieval history	24	3	15	24	1(II)
349S	The teaching of history	16	2	10	16	84
HOME ECONOMICS						
1	Food problems in home making	8		5	8	
6	Prevention of disease and home care of the sick	8		4	8	

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
10	Clothing economics	16		10	16	
15	Home furnishing and decoration	6		5	8	
17	Dress selection and appreciation	8		5	8	
19	Household management	8		5	8	
21	Art and design	24	3	15	24	2
25	The school lunch	8		5	8	
110	Household administration	16	2	10	16	110
INDUSTRIAL ARTS						
2A	Teaching and supervision of elementary school industrial arts	16	2	10	16	64 in part
2B	Teaching and supervision of junior high school industrial arts	16	2	10	16	64 in part
3	Administration of industrial arts education	16	2	10	16	
152	Principles of vocational and practical arts education	16	2	10	16	152
196	Advanced problems in the supervision of industrial education	16	2	10	16	196
180	Principles of educational and vocational guidance	16	2	10	16	180
181	Vocational guidance and counseling technique	16	2	10	16	181
ITALIAN						
1	Elementary Italian	32	4	20	32	1a
2	Elementary Italian	32	4	20	32	1b
3	Intermediate Italian	24	3	15	24	10a or 10b
LANDSCAPE DESIGN						
51	Landscaping home grounds	16		10	20	
LATIN						
1	Elementary Latin	40	5	25	30	1
2	Caesar	40	5	25	30	2
2A	Caesar	16	2	10	12.50	2 in part
2D	Caesar for students of medicine and pharmacy	40	5	25	30	2
3	Cicero: Orations	32	4	20	25	3
4	Virgil: Aeneid	40	5	25	30	4
4A	Virgil: Metre of the Aeneid	5		2.50	5	
5	Elementary composition	40	5	25	30	
6	Advanced composition	16 or 32	2 or 4	10 or 20	16 or 32	107
7	Livy, books I and XXI	24	3	15	24	6b in part
10	Cicero: De Senectute	16	2	10	16	6a in part
12	Terence: Andria and Phormio	16	2	10	16	6 in part
14	Horace: Odes	24	3	15	24	7 in part
15	Horace: Satires and Epistles	24	3	15	24	7 in part
16	Catullus	16	2	10	16	7 in part
17	Ovid: Metamorphoses	16	2	10	16	8 in part
18	Propertius: Elegies	8	1	5	8	8 in part
19	Tibullus: Elegies	8	1	5	8	8 in part
20	Cicero: Letters and orations	24	3	15	24	108
113	Ancient classical drama in English	16 or 24	2 or 3	10 or 15	16 or 24	
118	Classical mythology in literature	16	2	10	16	

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
LIBRARY METHODS						
1	Library methods for teacher-librarians	32		16	32	
2	Cataloging	16		10	16	
3	Elementary school library methods	16		10	16	
MATHEMATICS						
9	Elementary algebra: Part A	20		10	15	
	Part B	20		10	15	
10	Plane geometry	40		20	30	
8	Solid geometry	20	3	15	20	
2	Plane trigonometry	32	4	20	32	2
50	Advanced high-school algebra	20		10	15	
1	College algebra	32	4	20	32	1
3	Analytic geometry: Part A	24	3	15	24	3
	Part B	8	1	5	8	4
5	Elementary calculus: Part A	24	3	15	24	5a
	Part B	24	3	15	24	5b
71	Agricultural mathematics	32	4	20	32	71
45	Commercial arithmetic	10		5	10	
7	Mathematical theory of investment	32	4	20	32	7
24	Mathematics of life insurance	16	2	10	16	24
25	The theory of finite differences	8	1	5	8	
125	Theory of equations	24	3	15	24	125
115	Projective geometry	24	3	15	24	115
111	Advanced calculus	24	3	15	24	111
112	Differential equations	32	4	20	32	112
113	Theoretical mechanics	24	3	15	24	113
263	Higher algebra	24	3	15	24	263
114	Modern analytic geometry	24	3	15	24	114
117	Vector analysis	8	1	5	8	117S
50	Algebra for engineers	20		10	15	50
51	Elementary mathematical analysis	40	5	25	40	51
52	Elementary mathematical analysis	40	5	25	40	52
53	Elementary mathematical analysis	40	5	25	40	
54	Differential and integral calculus	32	4	20	32	54
55	Calculus	32	4	20	32	55
56	Calculus	32	4	20	32	
31	Practical arithmetic	8		4	8	
33	Mensuration and practical geometry	8		4	8	
6	Determinants and analytic geometry of three dimensions	24	3	15	24	6
32	Practical algebra	12		6	10	
34	Practical trigonometry	6		4	8	
35	Practical calculus	10		5	10	
41	Agricultural arithmetic	8		4	8	
62	Elementary algebra review	10		5	10	
MECHANICS						
1	Statics	24	3	15	24	1
2	Dynamics	16	2	10	16	2
3	Strength of materials	40	5	25	40	3
METEOROLOGY						
106	Climatology	24	3	15	24	106

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
MUSIC						
2	An introduction to music	16		10	16	
1A	Harmony	24	3	15	24	1(I)
1B	Harmony	24	3	15	24	1(II)
11A	Second-year harmony	24	3	15	24	11(I)
11B	Second-year harmony	24	3	15	24	11(II)
51	Theory and practice of grade school music	16	2	10	16	51
31A	History of music	16	2	10	16	31
31B	History of music	16	2	10	16	31
78	Community music	16	2	10	16	78
PHARMACY						
1	Pharmaceutical technique Part A	24	3	15	24	1(I)
	Part B	24	3	15	24	1(II)
20A	Elementary prescription practice	16	2	10	16	20(I)
20B	Prescription practice, solid preparations	16	2	10	16	20(II)
121A	Prescription practice, advanced	8	1	5	8	121
121B	Prescription practice, advanced	8	1	5	8	
30	Pharmaceutical technology	16	2	10	16	30
PHILOSOPHY						
41	Introductory ethics	24	3	15	24	41
11	Elementary logic	24	3	15	24	11
PHYSICS						
1	Elementary physics	40		20	30	
87	Physics review	12		6	12	
5	General physics	24	3	15	24	1a
6	General physics	24	3	15	24	1b
51E	Engineering physics	24	3	15	24	51
52E	Engineering physics	24	3	15	24	52
57	Physical optics	16	2	10	16	117
91E	Sound	8	1	5	8	91
POLITICAL SCIENCE						
123	American diplomacy	16	2	10	16	123
137	International law and organization	24	3	15	24	137
7	American government and politics, National	24	3	15	24	7a
PSYCHOLOGY						
1	General psychology	24	3	15	24	1
41	Educational psychology	24	3	15	24	Educ. 41
143	Psychology of individual differences and the measurement of intelligence	24	3	15	24	143
144	Psychology of learning	24	3	15	24	144
PUBLICITY						
1	Writing publicity for clubs	8		5	8	

Course Number	Title of Course	No. of Assignments	Credits	Tuition in Wisconsin	Tuition outside Wisconsin	Course No. of Residence Equivalent
SCIENCE						
1A	General science	16		10	15	
1B	General science	16		10	15	
SOCIOLOGY						
2	Introductory sociology—social problems	24	3	15	24	2
139	Social psychology	24	3	15	24	139
140	Principles of sociology	24	3	15	24	140
141	Poverty and dependency	24	3	15	124	141
25	Rural life	24	3	15	24	25
177	Social agencies and social legislation	16	2	10	16	177
SPANISH						
1	Elementary Spanish	32	4	20	32	1a
2	Elementary Spanish	32	4	20	32	1b
3	Intermediate Spanish	24	3	15	24	10a
4	Intermediate Spanish	24	3	15	24	10b
5	Advanced Spanish reading	16 or 24	2 or 3	10 or 15	16 or 24	21 in part
21	Elementary survey of Spanish literature	24	3	15	24	21 a or b
7	Don Quijote, Part I	24	3	15	24	104(I)
8	Don Quijote, Part II	24	3	15	24	104(II)
SPEECH						
1	Elementary speech writing	8		5	8	
30	Debate	8		5	8	
198	The teaching of speech	16	2	10	16	198
TEACHERS' REVIEW COURSES						
62	Elementary algebra	10		5	10	
87	Physics	12		6	12	

SPECIAL COURSES

BUSINESS

- Complete course in bookkeeping and accounting
- Private and general accounting
- Cost accounting
- Public accounting
- Business law
- Retailing

CIVIL ENGINEERING

- Surveying
- Structural steel drafting
- Reinforced concrete engineering
- Structural steel engineering
- Building design and construction
- Structural engineering

ELECTRICAL ENGINEERING

- Meterman's course
- Electrician's course
- Electrical design

MECHANICAL ENGINEERING

- Shop and industrial mathematics
- Mechanical drawing
- Drafting
- Machine design
- Architectural drafting
- Steam engineering
- Steam power plants

EXTENSION CLASSES

Extension classes are organized in various communities of the state whenever it is feasible to do so, and wherever a sufficient number of persons having a common interest in a given subject request such work. Many of the courses given by class instruction involve university credit for properly qualified persons. Other courses are organized and given independent of all curricular requirements for degrees, but definitely planned for vocational or avocational purposes.

MILWAUKEE CENTER

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WILLIAM JOHN FULLER, B.A., *Professor of Structural Engineering*
CHARLES EDMUND YOUNG, Ph.D., *Professor of Romance Languages*
JOHN JOSEPH CREAMER, B.A., LL.B., *Associate Professor of English*
MILES J. MARTIN, Ph.D., *Associate Professor of Physics*
GEORGE AMBROSE PARKINSON, Ph.D., *Associate Professor of Mathematics*
MARION REXFORD SCHNAITTER, M.A., *Associate Professor of Economics*
META MARY STEINFORT, M.A., *Associate Professor of Spanish*
GEORGE GALLOWAY TOWN, Ph.D., *Associate Professor of Chemistry*
HARRY THOMPSON AVEY, M.E., *Assistant Professor of Mechanical Engineering*
LEO STARR BALDWIN, B.S., *Assistant Professor of Drawing*
DONALD CLARK BOUGHTON, M.S., *Assistant Professor of Zoology* (on leave)
LEWIS ETHELBERT DRAKE, Ph.D., *Assistant Professor of Psychology*
FRANK MCCALL HURSLEY, M.A., *Assistant Professor of English*
HARRY LEWIS KUNZE, M.A., C.P.A., *Assistant Professor of Accounting*
MORRIS MARDEN, Ph.D., *Assistant Professor of Mathematics*
PAUL EMANUEL MILLINGTON, Ph.D., *Assistant Professor of Chemistry*
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CARL TAYLOR, M.A., *Assistant Professor of Speech*
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GEORGE HERMAN ABENDROTH, B.S., *Instructor in Civil Engineering*
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MARY RUTH BABCOCK, M.A., *Instructor in English*
JOSEPH GEORGE BAIER, Ph.D., *Instructor in Zoology*
LEON BATTIG, M.A., *Instructor in Mathematics*
DUDLEY COOKINGHAM BROOKS, M.A., *Instructor in English*
LESTER THOMAS EARLS, M.S., *Instructor in Physics and Mathematics*
LUCIUS T. GOULD, B.A., *Instructor in Geography*
CHAUNCEY CLAYTON HALE, M.S., *Instructor in Chemistry*
MRS. ELISABETH KATZ HOLMES, B.A., *Instructor in English*
ELSIE LAURA JAECK, B.A., *Librarian*
HILMAR CARL KRUEGER, B.A., *Instructor in History*
MRS. IRENE ETTA LANGWILL, B.A., *Recorder*
GEORGE LELAND LEFFLER, M.A., *Instructor in Economics*
CARL RALPH OESTREICH, B.S., *Instructor in Civil Engineering*
EUGENE A. RASOR, M.S., *Instructor in Mathematics*
VICTOR A. REINDERS, M.A., *Instructor in Chemistry*
THEODORE ALTON ROUSE, Ph.D., *Instructor in Physics and Mathematics*
CLAIR NATHAN SAWYER, B.S., *Instructor in Chemistry*
SAM SNEAD, *Instructor in Radio*
GRACIA ELIZABETH TORINUS, M.A., *Instructor in English*
JOHN ISAAC VASS, M.A., *Instructor in Mathematics*
MRS. FRIEDA ANNE MARIE VOIGT, B.A., *Instructor in German*

The work of the Extension Division in Milwaukee is carried on through day classes in which students take a full-time program of work, and evening classes in which they carry a part-time schedule of studies in the evening or late afternoon. The first unit of the new University Extension Building occupies a portion of the block between Sixth and Seventh streets, facing State street. It has fully equipped science laboratories, spacious classrooms, and a library.

The fees in both day and evening classes are computed on the basis of the number of credit hours carried, the rate being $5.00 per credit hour. This does not cover the cost of textbooks or laboratory charges.

DAY CLASSES

The day classes offer complete programs of the work of the freshman and sophomore years in Engineering and Letters and Science, including pre-commerce, pre-education, pre-journalism, pre-law, and pre-medicine.

With respect to their content, as well as with respect to general approach, the various courses offered in day classes are parallel to the courses listed under the same designations in the University at Madison. They have been approved by the respective residence departments at Madison and carry full credit toward a university degree.

A non-credit two-year class course in Building Design and Construction is offered, giving specialized, intensive training in the design and construction of buildings. It is of particular interest to men who wish to become building inspectors, construction superintendents, structural or architectural draftsmen, or structural designers. A certificate is given by the Extension Division upon the satisfactory completion of the course.

A non-credit one-year day class course in Radio Communication is offered. This is a new type of college training of semi-professional nature the object of which is to train young men for the positions which exist in that field between the skilled craftsman and the trained professional engineer. A certificate is given upon the satisfactory completion of the course.

ADMISSION REQUIREMENTS. The requirements for matriculation in the day classes, except for the course in Building Design and Construction, are in all respects the same as in the University at Madison. The general requirements for admission to the course in Building Design and Construction are two years of high-school work or its equivalent, including two semesters of high-school algebra. Experience in engineers' offices, drafting rooms, or on construction work will be given consideration toward entrance requirements. Students who are especially well prepared will be allowed to enter the second semester.

EVENING CLASSES

The courses offered in evening classes may be classified under four distinct heads:

University Credit Courses
Business Certificate Courses
Engineering Certificate Courses
Liberal Education Certificate Courses

The University Credit Courses are open to those who wish to obtain credits toward a degree during their spare time. To obtain such credits students must have satisfied the entrance requirements of the University and must have the prerequisites for the courses taken.

With a few exceptions, the Business and Engineering Certificate Courses do not offer credits leading to a degree. On the completion of a three-year evening course of study, a certificate is given by the Extension Division. Certificates are offered in the following fields of commerce and engineering: General Business, Accounting, Marketing and Advertising, Finance and Credit, Industrial Management, Secretarial Work, Building Design, Machine Design, Structural Design, Radio Engineering.

The underlying purpose of the series of courses in Liberal Education is to give an opportunity for adults to acquire an education which will create a feeling for those things which make life richer and more significant. A certificate is given on the completion of ten courses from this group.

POSTGRADUATE MEDICAL EXTENSION

In cooperation with the Medical School of the University, the Extension Division offers the following services to members of the medical and associated professions of Wisconsin:

MEDICAL LIBRARY SERVICE. Books, periodicals, reprints, abstracts, and bibliographies on medical subjects are supplied upon request, free of cost except for postage both ways on material lent.

EXTRA-MURAL LECTURES. Addresses by members of the university medical faculty and associated preceptors are arranged for meetings of medical societies.

LECTURE-CLINICAL COURSES. Competent leadership is provided for practitioner groups organized at county or district centers for the clinical and theoretical study of modern developments in treatment.

SHORT COURSES. From time to time university facilities will be made available and short courses organized in particular subjects, open to the medical and associate professions of the State.

DEPARTMENT OF DEBATING AND PUBLIC DISCUSSION

ALMERE LOUISE SCOTT, B.A., DIRECTOR

IDA MARIE GANGSTAD, B.A., *Assistant Professor of Library Methods*
LEONA ESSIE FREDERICA MCCUTCHEON, M.A., *Instructor in Debating and Public Discussion*
MINNIE HENRIETTA POPE, B.A., *Instructor in Debating and Public Discussion*
RUTH MARY ROWLAND, *Instructor in Debating and Public Discussion*
MAMIE AMELIA SANDERS, B.A., *Instructor in Debating and Public Discussion*
MRS. GEORGIA METZGER CORP, *Assistant in Debating and Public Discussion*
MRS. IONE BIRD MEYERS, *Assistant in Debating and Public Discussion*

PURPOSE

For the assistance and instruction of citizens who are interested in important social, educational, and political problems, the Department of Debating and Public Discussion fosters forum activities for deliberative study and discussion.

Inasmuch as the intelligent and active interest in and study of these questions among all classes of people tend essentially to the making of good citizens, the department issues suggestive and guiding bulletins, collects and maintains a loan library available through parcel post to residents of the State, and keeps in close touch through correspondence and personal interviews with community centers, civic clubs, farmers' clubs, women's and business men's organizations, parent-teacher associations, school and library boards, and literary societies of educational institutions.

GUIDED STUDIES

To meet a demand for group direction in serious study, the department offers Guided Studies. A registration fee of four dollars within Wisconsin and five dollars outside the State covers the cost of four sets of any of the studies. This fee also covers the privilege of guidance and directed study. For the accommodation of groups that wish to supply personal copies to members, additional sets are supplied at the cost of production. Single copies of the Guided Studies are available for independent study at seventy-five cents within the state of Wisconsin and one dollar outside the state.

Among the subjects on which studies are now available are: Parental Guidance and Education; Recent History of the United States; Browning; Contemporary Drama; Contemporary Novel; Novel of the Nineteenth Century; Shakespeare; American Diplomacy; Pan-American Relations; United States and World Politics; Political Parties and Practical Politics.

STUDY PROGRAMS. Topical programs are available on Africa, Child Nurture in the Home, China and Old Glassware, Home Crafts, Modern Italy, the Map of New Europe, and Psychology; others are in the process of preparation. These programs may be purchased outside of the state of Wisconsin at sixty cents for the first copy, for additional to ten, fifty cents each, and thirty-five cents each for ten or more; within the State, fifty cents for the first copy, thirty-five cents each, for additional to ten, and twenty-five cents each for ten or more. In cooperation with public libraries and state library commissions, the department aims to make the necessary reference material available to study groups and to individuals.

BULLETINS

Several compact and useful bulletins have been issued as aids to debaters, including: Debating Societies — Organization and Procedure; Principles of Effective Debating; How to Judge a Debate; and Triangular Debating Leagues. As special aids to organizations, bulletins on farmers' clubs, civic clubs, and parent-teacher associations have been published. The Triangular Discussion League bulletin suggests a plan to encourage the study and the intelligent discussion of great current problems not suited to a two-sided contest, but rather suited to a general discussion which brings out the many sides and salient facts.

FORMULATED QUESTIONS. The bulletins which formulate subjects for debate, giving brief historical facts and arguments, concluding with a selected, classified bibliography, serve as an impetus to careful study and have proved helpful and time-saving. Such questions as the following have been thus presented: Chain Stores; Closed vs. Open Shop; Commission Plan of City Government; Initiative and Referendum; Municipal Home Rule; The Recall; and Unemployment Insurance. These publications are sent upon receipt of list price.

MIMEOGRAPHED MATERIAL. Cuttings for public speaking in schools and for special programs, and mimeographed articles not easily available, on Chain Stores, Installment Selling, Compulsory Automobile Insurance, the Direct Primary, and Unemployment Insurance, are available. The department will send lists to those interested.

LOAN OF MATERIAL

The loan package libraries include selected newspaper and periodical clippings, office-bound sections of periodicals, government documents, publications of organizations, copies of addresses, reprints, typewritten excerpts, books—in fact

all forms of carefully selected available material dealing in a fair and balanced manner with the different phases of worthwhile subjects. In order that material may be selected judiciously, it is essential that the request for a package library state definitely the purpose for which the information is desired, and the latest date upon which it would prove of value. The same material cannot be used to the best advantage by a rural school pupil and a member of a woman's club.

The department aims to cooperate in every possible way with local librarians. Requests from communities which have public libraries should state what is available locally and thus avoid unnecessary duplication and expense.

DEPARTMENT OF PUBLIC SERVICE

PURPOSE. The Department of Public Service is composed of bureaus which deal with the informal or non-consecutive type of service as distinguished from the more formal and systematic type of instruction. These bureaus are concerned with questions and problems of general interest and public welfare.

The department serves as a clearing house through which all reasonable inquiries of the people of the State on matters of collective import may receive consideration.

ORGANIZATION. The Department of Public Service operates through the following bureaus, each in charge of a specialist: Bureau of Lectures and Short Courses, Bureau of Visual Instruction, Bureau of Economics and Sociology, Bureau of Dramatic Activities, Bureau of Business Information, and Bureau of Landscape Design.

METHOD. The department seeks to serve the individual inquirer, the group, and the community in establishing contact with specific lines of information, through the accumulation of data and the presentation of such data in non-technical form from such diverse sources as the reports of government bureaus, commissions, and experimental stations; the proceedings of scientific societies; publications of an economic, a social, a political, or an ethical character.

PUBLICATIONS. Bureaus of the Department of Public Service issue from time to time bulletins on subjects of timely interest. These are free to residents of the state of Wisconsin.

EXHIBITS. In addition to the specific lines of activity included within the fields of the various bureaus, the Department of Public Service has found the use of traveling exhibits and demonstrations upon such subjects as child welfare, health, recreation, and community-center work of very great value.

BUREAU OF LECTURES AND SHORT COURSES

ROBERT B. DUNCAN, CHIEF

PURPOSE. For instruction and platform inspiration in communities where the lyceum need exists, the Bureau of Lectures and Short Courses organizes and supplies local programs.

SCOPE OF SERVICE. The University offers through this department: (1) single lectures or series of such lectures; (2) lecture, concert, recital, or reading programs, or a miscellaneous combination of these. Such programs are offered with the definite purpose of developing better taste and higher standards with reference to public entertainments, and an appreciation of art, music, and literature by presenting examples.

LECTURES. The field covered by the lecture course is a wide one, including topics in education, history, geography and travel, political economy, political science, sociology, business administration, the history and literature of ancient and modern peoples, including Greek and Roman, Scandinavian, German, Semitic, French, and English life and letters, the physical sciences, engineering branches, forestry, and physical training. Bulletins containing detailed information will be sent upon request.

TEACHERS' CONVENTIONS AND INSTITUTES. The Extension Division will provide speakers for these meetings as far as the regular work of the University will permit.

COMMENCEMENT ADDRESSES. This department arranges for commencement addresses to be delivered by members of the university staff and others available in this service. The charges will be arranged in each case, for the speaker desired, through the Extension Division.

SHORT COURSES AND INSTITUTES. A short course or institute is an intensive training program or course ranging in duration from one day to two weeks. The program consists of a specialized series of lectures, discussions, and demonstrations directed by leading speakers and teachers secured from the faculty of the University and from the State and country at large.

SPECIAL OCCASION LECTURES. This department furnishes speakers for special occasions, such as memorial and dedication exercises, convocation addresses in schools, and for commercial organizations, and civic and women's clubs.

EXPENSES. The local expenses include hall rent and advertising in the local papers, and the lantern and operator, where the lecture is illustrated. Full information concerning lecturers' fees will be supplied on application.

BUREAU OF VISUAL INSTRUCTION

JOHN ELMORE HANSEN, Ph.B., CHIEF
FREEMAN BROWN, B.S., *Assistant Chief*
ROSE NATHENSON, B.A., *Assistant*
EFFIE APPLEBY, R.N., *Assistant*

The Extension Division has for loan purposes, lantern slides, motion picture films, and other illustrative materials on nearly all educational subjects. These materials are available to individuals and institutions within the State for educa-

tional purposes. This service is organized in the Bureau of Visual Instruction, which is making a thorough and systematic study of materials that may be used in illustrative teaching, or in instruction through the medium of the eye, and placing such materials within easy and constant reach of all schools and other civic organizations of the State. A complete catalog describing the material and service offered is mailed free upon request.

BUREAU OF ECONOMICS AND SOCIOLOGY

ROY JEFFERSON COLBERT, Ph.D., CHIEF

As university studies in the social sciences have grown in interest and importance, there has developed an increasing demand for information, counsel, and service in the practical application of economic and sociological principles in the community. The Bureau of Economics and Sociology was instituted in 1927 to afford a channel through which to perform such services systematically and effectively. It is a cooperative undertaking of the Departments of Economics and Sociology and the Extension Division and is intended to promote a better understanding of the social and economic resources of Wisconsin and to make readily available to the people of the State the University's knowledge, experience, and researches in the handling of social and economic problems.

The functions of the Bureau, as at present being developed, are: 1. To provide individuals, groups, and communities of the State with counsel, information, and services in its field, in cooperation with other organized agencies, public and private. Such counsel and services are extended only when there is a definite request and when those making the request undertake active cooperation and assistance. 2. To collect, organize, and publish data relative to the social and economic resources of the State, in cooperation with the Departments of Economics and Sociology and state governmental departments.

BUREAU OF DRAMATIC ACTIVITIES

ETHEL THEODORA ROCKWELL, B.A., CHIEF

In response to a growing demand for assistance in the selection and staging of plays and pageant-dramas in the schools, churches, and communities of the State, the Bureau of Dramatic activities was organized in 1927 as a cooperative agency of the Extension Division and the Department of Speech. In its functions the drama work of the former Bureau of Community Drama and Music of the Extension Division is resumed and expanded.

Correspondence on all questions relating to the arrangement and presentation of local-talent productions is invited. Specifically, the Bureau is prepared to render to schools, churches, clubs, little theaters, and communities of the State, upon request, the following services:

PLAY DIRECTING. As far as time permits, a representative of the Bureau will visit communities in the State to direct the actual staging of plays in all necessary details.

PAGEANT WRITING AND DIRECTING. Advice and local assistance will be rendered to communities contemplating the presentation of commemorative, historical, patriotic, or civic pageants.

ASSISTANCE IN CONDUCTING OR ORGANIZING COMMUNITY CHAUTAUQUAS OR PROGRAMS FOR FAIRS.

LENDING DRAMATIC MATERIAL. The Bureau has built up an extensive library of plays—long and short, modern and classical—suitable for children, high-school students, college students, and adult groups. Upon request a selection of books will be sent free of charge for examination.

ORIGINAL PLAY-WRITING. The Bureau desires to encourage the writing of original plays and will assist in conducting tournaments in play-writing in the schools and communities of the State.

ANNUAL DRAMATIC INSTITUTE. This institute, held the first two weeks of the regular summer session, gives intensive courses in play production, play writing, stage-craft design, pantomime, costume design, make-up, voice training, and children's dramatics. A small registration fee is charged.

WISCONSIN DRAMATIC GUILD. The Guild is a state organization sponsored by the Bureau. Its membership is made up of drama groups in urban little theatres, rural little theatres, schools, colleges, churches, and industrial plants. Each year the Guild conducts a dramatic festival week during which tournaments are held and dramatic demonstrations are given.

BUREAU OF BUSINESS INFORMATION

HENRY ROWLAND ENGLISH, M.A., CHIEF

CELIA HARRIMAN, B.A., *Librarian*

PURPOSE. This Bureau serves as an impartial agency through which the business men of Wisconsin may obtain accurate information on subjects related to their work. The School of Commerce co-operates with the Bureau in this work. Facts and figures from many governmental, university, and private sources are collected and interpreted.

ANSWERS TO INQUIRIES. Upon request the Bureau supplies available data on topics in the fields of accounting and statistics, retail store management, advertising and selling, business organization and management, federal and state income tax regulations, real estate, foremanship training, business correspondence, credits and collections, and business finance. When a request for information can not be answered completely by letter, published source material is lent to the inquirer.

PUBLICATIONS. The Wisconsin Retail Bulletin is issued monthly. It is distributed without charge to Wisconsin merchants who request it. A charge of $1 a year is made for out-of-state subscriptions. This publication contains in condensed form significant retail news, modern merchandising ideas, and summaries of business conditions in state and nation.

Lists of recommended books and pamplets are being prepared and distributed, covering the various fields of business. From time to time other publications containing information of interest to Wisconsin business men are issued.

BUSINESS CONFERENCES. Each year retail conferences are conducted in a number of Wisconsin cities by members of the Bureau staff. Practical ideas on retail merchandising, retail selling and advertising, and retail credits and collections are presented through addresses and individual conferences in the stores.

The Bureau also co-operates with the School of Commerce in sponsoring the state-wide Wisconsin Business Men's Conference, which is held annually at Madison.

FIELD ORGANIZATION

CHESTER ALLEN, DIRECTOR

NELSON DAVID CONNERS, B.A., *Field Representative, Milwaukee*
MARY KATHERINE FARRELL, B.A., B.M., *Field Representative, Madison*
EDWARD MILTON GORROW, *Field Representative, Appleton*
MARSHALL CONANT GRAFF, M.A., *Field Representative Appleton*
OTTO LOUIS KRASSELT, B.A., *Field Representative, Eau Claire*
WILLIAM HENRY H. LIESCH, *Field Representative, Oshkosh*
BENNO WALTER MEYER, B.S.A., *Field Representative, LaCrosse*
MRS. LEONE FORKNER, *Assistant, Madison*

For convenience and efficiency of administration the State is divided into districts in which field representatives are permanently located to organize and to make known the many opportunities available to each individual and community through the Extension Division.

Persons living anywhere in the State are thus able to have a personal conference in their own city with a university representative and are able to secure conveniently complete information regarding all the services of the Extension Division, such as, correspondence-study courses; local classes; package libraries, including medical; lectures and short courses; lantern slides and motion picture films; dramatic activities; and information on problems of business, economics, and sociology.

The field representatives are ready at all times to give assistance in organizing these activities for the use of the local community and may be reached promptly through the Field Organization office at Madison.

OFFICE OF THE EDITOR

LOUIS W. BRIDGMAN, B.A., EDITOR

The general purpose of the work of the editor is to make known to every citizen in the state the oppotunities available through the Extension Division.

PART VIII—
OTHER DIVISIONS OF INSTRUCTION

SUMMER SESSION
PHYSICAL EDUCATION
MILITARY SCIENCE

SUMMER SESSION

SCOTT H. GOODNIGHT, DEAN

The Summer Session, instituted thirty-four years ago as a period of study and review for teachers, has become an integral part of the university year, with nearly all departments represented. The courses range through all grades of undergraduate work to the most advanced graduate instruction and investigation. The work for teachers and for graduate students receives major emphasis, but very many undergraduate students of this and other colleges now avail themselves of the opportunity thus presented to shorten the period of their college residence or to make up deficiencies in either preparation or course requirements. They have the advantage in summer of being free from many of the distractions (inter-collegiate games, fraternity rushing, etc.) which obtain during the semesters. At the same time there is no lack of social life and wholesome recreation during the summer.

Courses, both academic and professional, are offered for graduates and for undergraduates in letters and science, education, engineering, medicine, law, and agriculture, for teachers in colleges, agricultural schools, high schools, and technical schools, and for special students, as lawyers, doctors, chemists, writers, social workers, farmers, and practicing engineers. Virtually all the courses carry full academic credit. All the library, laboratory, and other facilities of the University are available during the summer, and the opportunities for thesis and advanced investigative work are particularly favorable at this time. A special bulletin describing the various courses is issued annually, copies of which may be obtained upon application to the Dean.

UNDERGRADUATES. The admission requirements for a student who desires credit toward a degree at Wisconsin are the same for the summer session as for the other sessions at the University; these are described in detail beginning with page 33. A student who desires to graduate from the University and who comes with advanced standing from a normal school or from another college or university, should submit a complete official record of his preparatory work and college credits to the advanced standing committee of the college he expects to enter.

A student who wishes to secure credit toward graduation at some other institution, but who is not a candidate for a degree at Wisconsin, need not comply with the entrance requirements but may register upon presentation of a satisfactory statement of status and aims. Forms for such statements are provided in the summer session bulletin. Upon registration by this method, a student may enroll in any course or courses, which, in the estimation of the instructor in

charge, he is able to carry to advantage. Upon satisfactory completion of such work, application may be made to the Registrar for a transcript of credits stating the number of hours of work carried and the grades earned. Credit toward graduation at this University, however, will be given only after complete matriculation by one of the regular methods.

GRADUATES. A general statement of work in the Graduate School may be found on page 390 of this catalogue. The Graduate School also publishes a special bulletin containing detailed information.

The University has instituted special nine-week summer session courses for graduate students only. In 1931 over 60 courses of strictly graduate grade were offered, enabling graduate students to earn one-half semester of residence credit toward a higher degree. To be eligible to carry these courses, a student must be enrolled in the Graduate School and must have had his candidacy for a higher degree approved. No auditors are permitted in the nine-week courses. It is probable that in future summers the number and range of the nine-week courses will be increased.

The inauguration of nine-week courses does not affect the privilege of doing graduate work in the six-week session, except that the number of graduate courses offered in the latter is somewhat decreased.

CREDITS. The maximum number of credits which may be earned toward a degree at Wisconsin is six for the six-week session, eight for the ten-week session of the Law School, and one for each week of pre- or post-session or special work for which the student is properly registered. In the Graduate School, credit is by period of residence only, a six-week session yielding one-third of a semester and a nine-week session yielding one-half a semester of residence credit toward a higher degree.

Each student will be required to carry at least four credits of work unless specifically exempted from this requirement by the Dean of the Summer Session. However, students enrolled in the Graduate School will arrange their programs with the Graduate Office.

SUMMER SESSION FEES

INCLUDING TUITION, INCIDENTAL, AND INFIRMARY (BUT NOT LABORATORY) FEES

The same fees are charged to both residents and non-residents of Wisconsin.

I. For undergraduates and graduates in all colleges and schools, except the Graduate School, the basic rate is $4.50 per week plus special fee of $2.00 for the Infirmary and $1.50 for the Union.

Classification	Period	Tuition	Infirmary and Union	Total
Railway Engineering	2 weeks	$ 9.00	.....	$ 9.00
Field Courses	4 weeks	18.00	.....	18.00
Chemical Engineering	5 weeks	22.50	3.50	26.00
General Session—Undergraduates	6 weeks	27.00	3.50	30.50
Law School	10 weeks	45.00	3.50	48.50

II. For graduates admitted to registration in the Graduate School, the rate is $5.00 per week plus Infirmary and Union fees.

General Session Graduate School	6 weeks	$30.00	$3.50	$33.50
Special Courses Graduate School	9 weeks	45.00	3.50	48.50

Pre-and Post-Session Fees

Undergraduate: $4.50 per week. If registrant was not in Summer Session, $8 for first week and $4.50 for each succeeding week.

Graduate: $5 per week. If registrant was not in Summer Session, $8.50 for first week, and $5 for each succeeding week.

SPECIAL FEES. Graduate students previously enrolled in the University and who during the summer wish to engage in independent research without earning credit in any form shall register in the Summer Session, paying a fee of $5, plus laboratory or library fees as their work may necessitate.

Graduate students pursuing no courses but who are candidates for an oral examination during the session, may register after the third week of the session for a fee of $10, but may earn no credit.

Refunds for the six-week session are authorized as follows: if the student withdraws between opening day and first Friday, 80%; between first Saturday and second Wednesday, 60%; between second Thursday and third Monday, 40%; between third Tuesday and third Saturday, 20%; after the third Saturday, no refund.

OTHER EXPENSES. In courses involving laboratory work, additional fees are charged; these correspond closely to the laboratory fees charged for the same courses taken during the academic year. Other expenses for the six-week session may be estimated from the following: room-rent, $15–$30; board, $40–$55; books and classroom materials, $8–$15; incidental expenses, including laundry, $16–$60; total, not including fees or traveling expenses, $78–$160.

PHYSICAL EDUCATION

The Departments of Physical Education have jurisdiction over all athletic, aquatic, and gymnastic activities. Their aims are: (1) to promote the physical development of the students by (a) contributing to their health, organic vigor, and good physical habits, (b) providing an incentive and an opportunity for every student to engage in some physical activity at least one hour daily as a balance to the sedentary demands of university life, and (c) conserving the social and moral values of games and sports and securing to every student the fullest opportunity for their practice; (2) to train physical educators and play leaders; and (3) to promote a more effective organization of play and administration of physical education throughout the state of Wisconsin.

EXEMPTIONS AND DEFERMENTS

All applications for deferment of or exemption from physical training for men must be made at the office of the Director of the Men's Gymnasium; women will apply to the Director of the Women's Department in Lathrop Hall. In no case will permission be granted to defer work for more than one semester at a time and no deferred work will be allowed to extend into the senior year.

I. EXEMPTIONS PROVIDED FOR BY THE RULES OF THE UNIVERSITY

1. Students who are physically unfit, as certified by the Department of Student Health.
2. Normal-school graduates and those who enter the University with college credits sufficient to give them junior standing.

II. EXEMPTIONS UNDER THE POLICY OF THE DEPARTMENT

1. Students from institutions of college or university rank who have taken accredited courses in physical education, providing proper credentials are presented.
2. Adult special students over 23 years of age who are not candidates for degrees.
3. Other cases, at the discretion of the Director.

III. DEFERMENTS REQUIRED TO BE MADE UP IN THE DEPARTMENT

1. Self-supporting students where the hours of labor actually conflict with hours of required work.
2. All cases not falling under any of those previously mentioned.

MEDICAL AND PHYSICAL EXAMINATIONS

The organic condition, stage of physical development, and degree of motor efficiency attained by each entering freshman and sophomore are determined at the opening of the college year by a series of examinations and tests made by the Department of Student Health and the appropriate Department of Physical Education. An endeavor is made to determine the student's exact organic condition with a view to outlining for him a proper regimen of exercise, diet, rest, and work. Students are classified on an organic scale and are permitted to engage only in sports and games for which they are physically fitted. No student is permitted to participate in competitive games either of intercollegiate or intramural grade unless physically fit therefor, as determined by the examination. All candidates for football and other teams must be examined by and secure the permit of the Department of Student Health as well as that of the Department of Physical Education before reporting for practice with their squads.

VOLUNTARY EXERCISE

All students are urged to take at least one hour of recreative exercise each day and the facilities of the entire department are open for this purpose whenever not required for prescribed activities. Advice and direction may be secured by any student at any time. All advanced practice courses are open to any student fitted to take them.

MEN'S DEPARTMENT

GUY S. LOWMAN, DIRECTOR

EQUIPMENT

The men's gymnasium, 200 by 100 feet, with an annex 225 by 84 feet, is located on the shore of Lake Mendota. On the ground floor are the offices, locker rooms, showers and swimming pool. The second floor is an unobstructed hall 165 by 98 feet, used for military science, intramural activities, and basketball. The main gymnasium hall, 165 by 65 feet, is located on the third floor and includes the usual gymnasium equipment, wrestling room, and handball courts. The annex is equipped with a 12-lap cinder track, a baseball cage, and a rowing room.

The outdoor facilities of the department include the university athletic field of 33 acres at Camp Randall; a concrete stadium seating 42,000; a quarter-mile track with a 220-yard straightaway; the varsity football field within the quarter-mile track, and five additional football fields; a varsity baseball diamond, two freshman diamonds, and six additional practice fields; and 24 tennis courts. The new intramural fields comprise thirteen acres of ground; included in this area are four regulation football fields serving a dual purpose (three regulation baseball diamonds are laid out on this area in the spring), thirteen tennis courts, a sixth-mile track, 120-yard straightaway, an area for high-jumping, pole-vaulting, and javelin throwing, and three diamond-ball courts. The construction of a golf course is also being considered.

The lower campus, an open playground of two acres located directly in front of the men's gymnasium, is used for the required activities of the department during the early fall and spring. During the winter months this campus is flooded and used for varsity and intramural hockey.

The new field house, 234 by 205 feet, is located at the southwest corner of Camp Randall. The track facilities in this building include an eighth-mile track, two 60-yard straightaways, and a moulder's clay surface for field events. Basketball facilities include an exhibition and a practice court, both with removable floors in order to permit football practice in the fall and baseball in the spring, during periods of inclement weather. The field house seats 8,000 spectators, with provisions for an increase up to 12,000.

Extensive water sports are promoted during the spring and summer months. Lake Mendota, which adjoins the campus, affords excellent opportunities for swimming, canoeing, and crew. The university boat house, just back of the men's gymnasium on the lake shore, is equipped with eight-oared shells, four-oared barges, and "war" canoes, and provides storage room for canoes belonging to students. Two modern, high-speed launches of 100 and 125 horse-power, supplied with complete life-saving equipment, are kept in constant commission for instant service throughout the boating season.

Outdoor winter sports are particularly encouraged. There are opportunities for skating and hockey on the rinks maintained by the department on Lake Mendota and on the lower campus. A ski jump of 115 feet has been constructed, which is one of the best in this part of the country. The University also maintains a toboggan slide. Lake Mendota offers excellent opportunities for ice boating.

REQUIREMENTS FOR MEN

Freshman and sophomore men are required to take three hours a week of either physical education, military science, or band instruction. The requirement in physical education may be satisfied through participation in team sports, intramural sports, or physical education classes. These may be selected from the list of activities given below. All men electing any phase of physical education must register at the men's gymnasium at the regularly appointed time at the beginning of each semester.

The regulation indoor suit for men consists of a white sleeveless shirt with "Wisconsin" across the front, white running pants with cardinal trim, supporter, sweat socks, and rubber soled shoes. The outdoor suit consists of a plain gray sweat suit.

The gymnasium fee is $2.00 each semester, required of each student taking either optional, required, or elective work in the department. Freshmen and sophomores are assigned cubicles with a combination padlock. A deposit of one dollar is required for this lock, refund being made when the student returns the lock.

VARSITY SPORTS

FALL	WINTER	SPRING
Baseball	Basketball	Baseball
Basketball	Crew	Crew
Crew	Fencing	Cross-country
Cross-country	Gymnastics	Football
Fencing	Ice hockey	Golf
Football	Skating	Tennis
Gymnastics	Skiing	Track
Swimming	Swimming	
Track	Track	
Wrestling	Wrestling	

INTRAMURAL SPORTS

Football	Basketball	Baseball
Football (touch)	Bowling	Diamond ball
Cross-country	Boxing	Golf
Tennis	Hockey	Tennis
	Swimming	Track
	Track (indoor)	
	Water-polo	
	Wrestling	

PHYSICAL EDUCATION CLASSES

Basketball	Basketball	Baseball (playground)
Corrective	Boxing	Corrective
Cross-country	Corrective	Cross-country
Fencing	Fencing	Gym
Football (touch)	Gym	Swimming (advanced)
Gym	Handball	Tennis
Soccer	Swimming (advanced)	Track
Swimming (beginners only)	Track	
Track	Tumbling, apparatus, and stunts	
Tumbling, apparatus, and stunts	Volleyball	
Volleyball		

NOTE: All non-swimmers electing intramural sports or physical education classes are assigned to a beginners' swimming class the first semester. All students taking physical education are required to be able to swim a distance of fifty yards by the end of the sophomore year.

ATHLETIC COMPETITION FOR MEN

Interclass and intercollege tournaments and contests are conducted in all games and sports under the supervision and control of the department. In the conduct of the men's activities the department has the co-operation of the intramural athletics committee of the Athletic Board, consisting of six students representing Agriculture, Commerce, Engineering, Law, Letters and Science, and Medicine.

The University is a member of the Western Intercollegiate Conference Athletic Association and maintains representative teams in all intercollegiate sports. No student may be a member of an intercollegiate team unless (1) he is eligible according to the requirements of the Student Life and Interests Committee, (2) has been a year in the University, (3) has no unsatisfied failures, conditions, or incompletes, (4) has received a weighted average of at least .8 of a grade-point in the work of the previous semester, and (5) is carrying full work.

Intramural and intercollegiate sports are under the government of the Athletic Council, a subcommittee of the Faculty Committee on Student Life and Interests.

WOMEN'S DEPARTMENT

BLANCHE M. TRILLING, DIRECTOR

EQUIPMENT

The Women's Department is housed in Lathrop Hall. The main gymnasium is two stories high, with floor 118 by 60 feet, visitors gallery, and running track. A small gymnasium located adjacent to the main gymnasium, is used for smaller classes. Another small gymnasium, a dance studio, and a lecture room are on the fifth floor, and an additional lecture room is located on the first floor. Each room is suitably equipped for the type of class conducted there. Two floors of one wing contain dressing rooms, showers, and lockers, designed for the accommodation of 1,000 students. In the basement are four bowling alleys, the swimming pool 60 by 20 feet, well lighted and ventilated, and supplied with filtered and chlorinated water. Just off the swimming pool are dressing rooms, showers, and hair-drying apparatus.

CONTESTS AND TOURNAMENTS FOR WOMEN

The Women's Athletic Association cooperates with the Department in the conduct of women's activities. "Sports-for-all" is the objective toward which the Women's Athletic Association is working. The activities are numerous and diverse so that every girl may enjoy some form of exercise.

Intramural activities interest large numbers of girls; class teams are active during the entire year in all the various sports; the W.A.A. Cottage on Lake Mendota affords excellent opportunities for week-end parties and picnics; Outing Club promotes interest in such activities as hiking, skiing, coasting, tobogganing, and ice skating; Dolphin Club stimulates interest in swimming, diving, and water games; Orchesis is an advanced dancing class organized to give opportunity beyond the regular scheduled class work.

REQUIREMENTS FOR WOMEN

The equivalent of two hours a week is required in each season of all freshman and sophomore women, to be elected from the list of activities given below.

The college year is divided into four terms, (1) Fall—September to November; (2) Winter—November to February; (3) February to April; (4) Spring—April to June. At the beginning of each of these terms, all women taking elective or required work must register in Lathrop Hall for their work for the coming term. This must be done at the appointed time regardless of whether physical and medical examinations have been taken.

FALL	WINTER*	SPRING
Archery	Basketball	Archery
Corrective work	Baseball	Baseball
Dancing	Bowling	Canoeing
Field hockey	Corrective work	Corrective work
Horseshoes	Dancing	Dancing
Golf	Fencing	Field and track
Health work	Fundamental gymnastics	Golf
Riding	Golf	Health work
Swimming	Health work	Riding
Tennis	Ice hockey	Swimming
Volley ball	Outdoor sports	Tennis
	Riding	
	Skating	
	Skiing	
	Swimming	

*A study of the laws of personal and general hygiene is included in the winter work.

For women a uniform suit is required and should be purchased in the fall in Madison; the cost is about $5.00. Regulation rubber sandals are required for those enrolled in swimming.

The gymnasium fee $2.00 each semester, required of each student taking either required, optional, or elective work in the department.

MILITARY SCIENCE

GUSTAV V. GONSER, *Major of Infantry USA, Commandant and Professor of Military Science*

REMINGTON ORSINGER, B.S., *Captain of Infantry USA, Assistant Professor of Military Science*

GEORGE EDWIN FINGARSON, *B.A., Captain of Infantry USA, Assistant Professor of Military Science*

WILLIAM FRANCIS DALTON, *Captain of Infantry USA, Assistant Professor of Military Science*

FRANK CELESTINE MEADE, *First Lieutenant Signal Corps USA, Assistant Professor of Military Science*

HARRY LOVEJOY ROGERS, JR., *First Lieutenant of Infantry USA, Assistant Professor of Military Science*

FREDERICK WILLIAM POST, *First Sergeant USA Retired, Assistant to the Commandant.*

OBJECT AND SCOPE OF INSTRUCTION

The object of the military instruction is to train students for the performance of the duties of commissioned officers, should their services be needed by the country. The instruction is necessary in order to prepare them to perform those duties intelligently and enables them to be thus partly trained with the least practicable interference with their civil careers. It is hoped that by this system there may be available, in time of national emergency, an increased number of educated men trained in military science and tactics, to lead the units of the large armies upon which the safety of the country will depend.

The courses in military training prepare for leadership in civil life as well as in the military service, for the same qualities are demanded in both. The tactful handling of men, the ability to cooperate with others, the organization of effort and resources are common factors of success in either military or civil life. Military training develops efficiency, patriotism, leadership, and those qualities of manliness so essential in all walks of life.

The courses provide the ground work upon which to build military character and proficiency, and are designed to develop the greatest possible initiative on the part of the student. They also provide that the cadet officers and non-commissioned officers shall participate in the administration and training and share in the responsibilities thereof.

REQUIREMENT

Freshman and sophomore men are required to take three hours a week of either military science, physical education, or band instruction. If military science is elected, it must be pursued continuously for two years, unless deferment of the course is secured from the Military Department. However the two years must be completed in any case prior to graduation unless excused because of permanent physical disability.

Students entering from schools where they have had the basic ROTC course may take the advanced course in the freshman year in fulfillment of the general option in military science, but without academic credit. In the sophomore year the advanced course may be elected for academic credit as well as in fulfillment of the option.

RESERVE OFFICERS' TRAINING CORPS

The Department of Military Science comprises Infantry and Signal Corps units of the Reserve Officers' Training Corps, organized under the National Defense Act of June 3, 1916. This act provides for a progressive course of military training consisting of two years of basic and two years of advanced work. Three hours a week are required in the basic course and five in the advanced course.

Upon completion of the sophomore year of the basic course, those students who are selected for further military training by the President of the University and the Commandant may elect to take the work of the advanced course. This necessitates a written agreement on the part of the student that he will continue the work, taking it five hours a week for two years, and attend one summer camp of not more than six weeks' duration.

Upon the execution of this agreement, the War Department furnishes to members of the advanced course, in addition to uniforms and equipment, commutation of subsistence at the rate of about $9 a month for twenty-one months. Students enrolling in the advanced course must begin the work in such course at least two years prior to normal completion of the students' academic course, save in exceptional cases, and then only upon the fulfillment of certain conditions. Students who once begin either the basic or advanced course and later withdraw from college are under no obligation to the government whatever, unless they reenter this institution at a later date, in which case they are required to continue their military science course.

Students are paid at the rate of $21 a month while attending advanced course camps. All transportation to and from the camp and the expenses at camp are paid by the government.

Upon satisfactory completion of the advanced course, including the prescribed camp training, graduates who are twenty-one years of age are eligible for appointment by the President of the United States as members of the Officers' Reserve Corps, United States Army. Such graduates who are not yet twenty-one years of age are given certificates of eligibility for a commission. Upon reaching the age of twenty-one, these students are commissioned as Second Lieutenants, Officers' Reserve Corps, without any mental or physical examination.

UNIFORMS

Basic course students make one deposit of $2.00 at the beginning of each semester. Upon completion of the two-year course each student is refunded $5.00 and is permitted to retain his uniform. There is no additional cost, all arms and equipment being furnished by the Federal Government. Each advanced course student deposits $7.50 and in return receives an excellent uniform suitable for wear after he receives his commission in the Reserve Corps. He retains this uniform upon completion of the course.

PERSONNEL AND EQUIPMENT

The instruction in the Department of Military Science is conducted by a corps of six Regular Army officers selected by the War Department from the Infantry and Signal Corps and, in addition, selected non-commissioned officers of these branches, highly trained in their profession. A considerable amount of equipment has been provided by the Federal Government in order that instruction may be both complete and practical.

The department maintains representative teams in rifle and pistol shooting. Last year the ROTC Rifle Team placed first in the Sixth Corps Area matches and attained an excellent rating in national and other competitions. The ROTC

Pistol Team was organized in 1930 and succeeded in winning a majority of its matches during its first two seasons. Both squads received training in shooting for about five months during the year, and fire correspondence matches with all the leading schools and colleges in the United States, as well as several shoulder-to-shoulder and special matches.

Two drill teams are maintained by the department, one composed of selected advanced course students and the other of basic course students selected from the honorary basic company. Both compete with teams of other institutions and also appear in exhibition drills on occasions. In spring drill competitions conducted annually by the Wisconsin Reserve Officers' Association, the Advanced Course Drill Team placed second in 1929 and 1930. In 1931 that team was the winner and Basic Course Team placed fifth among nine teams competing.

Scabbard and Blade is a national honorary fraternity of 75 chapters to which cadet officers are eligible for membership. Company A, First Regiment, was founded at this University in 1904.

COURSES OF INSTRUCTION

BASIC COURSES

1. First-Year Basic Infantry. Yr. The National Defense Act and the ROTC, military courtesy and discipline, military hygiene and first aid, drill and command, rifle marksmanship, scouting and patroling. Captain Fingarson.

3. First-Year Basic Signal Corps. Yr. The National Defense Act and the ROTC, military courtesy and discipline, military hygiene and first aid, drill and command, military telegraph, army organization, military telephones. Lieut. Meade.

21. Second-Year Basic Infantry. Yr. Drill and command, musketry, automatic rifle, scouting and patroling, combat principles (rifle squad). Lieut. Rogers.

23. Second-Year Basic Signal Corps. Yr. Drill and command, military telegraph, military telephones, radio sets, pistol and personal equipment. Lieut. Meade.

ADVANCED COURSES

131. First-Year Advanced Infantry. Yr; 3 cr. Map reading and military sketching, drill and command, machine gun, 37 mm. and 3″ mortar, combat principles (rifle section and platoon). Captain Orsinger.

133. First-Year Advanced Signal Corps. Yr; 3 cr. Military sketching and map-reading, drill and command, message center, codes and ciphers, communication engineering, tactical principles, and principles of signal communication. Lieut. Meade.

141. Second-Year Advanced Infantry. Yr; 3 cr. Military law and Officers' Reserve Corps regulations, military history and policy, administration, field engineering, drill and command, combat principles (rifle and machine-gun company and howitzer-company platoon). Captain Dalton.

143. Second-Year Advanced Signal Corps. Yr; 3 cr. Military law and Officers' Reserve Corps regulations, military history and policy, administration and supply, field engineering, drill and command, communication engineering, signal corps tactics. Lieut. Meade.

PART IX—ASSOCIATED SCIENTIFIC INSTITUTIONS

FOREST PRODUCTS LABORATORY
STATE LABORATORY OF HYGIENE
UNITED STATES WEATHER BUREAU
WASHBURN OBSERVATORY
WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY
STATE TOXICOLOGICAL LABORATORY
STATE OF WISCONSIN GENERAL HOSPITAL
WISCONSIN PSYCHIATRIC INSTITUTE
STATE HISTORICAL SOCIETY
WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS

FOREST PRODUCTS LABORATORY

C. P. WINSLOW, DIRECTOR

The Forest Products Laboratory is a scientific institution engaged in research for the Forest Service, United States Department of Agriculture, in cooperation with the University of Wisconsin. The final objective of the research activities of this organization is to secure maximum economy and efficiency in the production and utilization of forest products with a view to prolonging the present timber supply and encouraging the practice of forestry through greater financial returns. The staff of the laboratory cooperates with that of the University of Wisconsin in the courses of lectures and research outlined below. The laboratory offers unusual facilities for research in the field of forest products and possesses very complete scientific and technical equipment for this purpose. In its investigations it approximates closely commercial conditions and cooperates extensively with the various manufacturing establishments in testing out its research on a commercial basis.

The technical investigations of the laboratory are as follows:

(1) Mechanical Properties of Wood. Investigations of strength, stiffness, hardness, and other mechanical properties of commercial woods; effect of treatments on strength; tests on fabricated materials and manufactured articles; the development of grading rules for structural timbers.

(2) Seasoning of Wood. Determination of best methods of air drying and kiln drying to eliminate losses; design and operation of dry kilns; studies of commercial kilns; physical properties of woods.

(3) Shipping Containers. Study of wooden and fiber shipping containers, with special reference to design and specifications to develop containers which will deliver the contents to the consumer in a satisfactory condition at a minimum total cost.

(4) Plywood, Glues, and Laminated Stock. Study of plywood manufacturing problems; strength and design of plywood; development and improvement of glues; study of new uses for laminated construction in commercial work.

(5) By-Products and Chemical Studies. Research on the methods of production and utilization of by-products, such as alcohol, turpentine, rosin, acetate, etc., obtained from various forms of wood and wood waste; and general wood chemistry.

(6) Wood Preservation. Research on fungi which attack structural timbers, with investigations aimed at practical means of prevention; the efficiency of various wood-preserving processes and preservatives.

(7) Pulp and Paper. The suitability of woods and other fibrous materials for pulp, paper, and fiber specialties; studies in the chemistry and engineering of pulping and paper-making processes; chemical and physical studies of pulps and papers.

(8) Silvicultural Relations. Identification of wood; the effect of growth conditions on the structure of wood; and the relation of the structure of wood to its properties.

(9) Technical Studies of Wood-Using Industries. Study of the economic utilization of wood with a view to eliminating waste; lumber grades and specifications; methods of measuring, manufacturing, and marketing logs, lumber and small dimension stock; development of efficient uses of wood.

The lectures and research are offered by the staff of the laboratory to both undergraduates and graduates. Several courses on various technical activities are given in the Extension Division, as announced on page 418.

STUDENT RESEARCH ASSISTANTSHIPS

Students who show unusual ability in research may be appointed as student research assistants in this laboratory by the Forest Service or by the Bureau of Plant Industry, in accordance with the regulations of the United States Civil Service Commission, at a salary not exceeding $40 per month. Application for these assistantship must be made to the Director of the Forest Products Laboratory. The number of students thus appointed will largely depend upon the funds available and the number of suitable problems taken up by the laboratory for solution. Students may choose one of the problems as major or minor work for a thesis as part of the requirements for a higher degree.

LECTURE AND LABORATORY COURSES

These courses do not supply the needs of students desiring to take up the study of forestry as a profession. Such students should enter one of the regular forestry schools.

FORESTRY AND WOOD TECHNOLOGY

HARRY DONALD TIEMANN, M.E., M.F., *Lecturer in Forest Products*
FREDERICK LINCOLN BROWNE, Ph.D., *Lecturer in Forest Products*
ELOISE GERRY, Ph.D., *Lecturer in Forest Products*
ARTHUR KOEHLER, M.S., *Lecturer in Forest Products*
LORRAINE JOSEPH MARKWARDT, C.E., *Lecturer in Forest Products*
JOHN A. NEWLIN, B.S., *Lecturer in Forest Products*
CLARICE AUDREY RICHARDS, Ph.D., *Lecturer in Forest Products*
THOMAS ROY TRUAX, M.S., *Lecturer in Forest Products*

1. GENERAL FORESTRY. I; 2 cr. Open to all students with the exception of freshmen in Letters and Science. General introductory course. The first part is devoted to an outdoor study of trees and to lectures concerning their growth and the use of their products. The remainder of the course takes up the natural forest conditions of the United States, and the history of the development of a forest policy. There are no prerequisites to this course. 11 TT. Mr. Tiemann.

101. PROPERTIES OF WOOD. I; 2 cr. Open to all students. Relation of the structure of wood to its properties. Physical, mechanical, and chemical properties; pulping characteristics; gluing characteristics; relation of defects and fungi to wood properties. Prerequisite: Forestry 1. This course is of particular value to students in architecture, engineering, manual training, and agriculture, and to students desiring to go into the lumber or wood-using industries. May be preceded or followed by Course 102. Offered 1931-32 and in alternate years. 4:30 TT. Mr. Koehler and staff.

102. WOOD TECHNOLOGY. II; 2 cr. Open to all students. Includes a study of the structure of wood; identification of commercial species of wood. A logical sequence to course 101, but may be taken independently. Especially suited for students who expect to go into some wood-using business, or for students planning to take a course in forestry elsewhere. 11 TT. Mr. Tiemann.

119. DISEASES OF TIMBER. I; 2 cr. The course is designed to familiarize the student with the fungous defects in wood products. Opportunity is given to study the morphology of the casual organisms, their temperature and moisture relations, and methods of controlling them. The technique of sectioning and staining wood and isolating the causal organisms is included. Offered 1931-32 and in alternate years. Lect. and lab. 1:30-5:30 W. Miss Richards.

CHEMISTRY OF FOREST PRODUCTS

ERNEST BATEMAN, Ph.B., *Lecturer in Forest Products*
MARK WILDER BRAY, B.A., M.S., *Lecturer in Forest Products*
FREDERICK LINCOLN BROWNE, Ph.D., *Lecturer in Forest Products*
CARLETON EDGAR CURRAN, Ph.D., *Lecturer in Forest Products*
LEE FRED HAWLEY, Ph.D., *Lecturer in Forest Products*
GEORGE MCMONIES HUNT, B.S., *Lecturer in Forest Products*
CLARICE AUDREY RICHARDS, Ph.D., *Lecturer in Forest Products*
GEORGE JOSEPH RITTER, Ph.D., *Lecturer in Forest Products*
EARL CHARLES SHERRARD, Ph.D., *Lecturer in Forest Products*
ALFRED JOAQUIN STAMM, Ph.D., *Lecturer in Forest Products*

103. INDUSTRIAL CHEMISTRY APPLIED TO FOREST PRODUCTS. II; 2 cr. Includes course of lectures descriptive of industrial chemical processes that use wood and wood waste, such as pulp and paper, wood distillation, and wood preservation, and the chemistry of various forest products. Prerequisites: Chemistry 120, 121. 4:30 TT. Mr. Hawley, Mr. Bateman, Mr. Sherrard, Mr. Ritter, Mr. Curran, Mr. Bray, Mr. Stamm.

200. RESEARCH IN FOREST PRODUCTS CHEMISTRY. Yr; *cr.

Coal tars, wood tars, and wood preservatives. Mr. Bateman.

The chemistry of wood extractives and wood lignin. Mr. Sherrard.

General wood chemistry. Mr. Hawley, Mr. Ritter.

The chemical action of bacteria and fungi on wood and pulp. Mr. Bray, Miss Richards.

Physical and colloidal properties of wood and wood products. Mr. Stamm.

Pulp and paper. Mr. Curran, Mr. Bray.

Wood preservation and glues. Mr. Hunt, Mr. Browne.

STATE LABORATORY OF HYGIENE

W. D. Stovall, Director, Professor of Hygiene

The State Laboratory of Hygiene, located in the Service Memorial Institutes Building on the university campus, is at once a university laboratory and the central laboratory for the State Board of Health. The staff is occupied in teaching, in the development of laboratory tests which are of assistance in the diagnosis and control of communicable diseases, in other laboratory procedures with which sanitary science is concerned, and in special investigation.

Last year 77,780 specimens for the diagnosis of diptheria, typoid fever, anthrax, rabies, tuberculosis, whooping cough, and other diseases were received from physicians, health officers, public health nurses, and others throughout the state. The facilities of the laboratory are used by three-fourths of the physicians in the state. Prophylactic vaccines are distributed free from the laboratory, and silver nitrate ampules are prepared for free distribution by the State Board of Health.

For the convenience of physicians and health officers, cooperative laboratories have been established in Beloit, Green Bay, Kenosha, Oshkosh, Rhinelander, Sheboygan, Superior, and Wausau. The state contributes a portion of the funds required for the operation of each of these laboratories, and the respective cities supply the remainder. These branch laboratories are under the supervision of the director of the State Laboratory of Hygiene, acting for the State Board of Health.

The principal work of both the central and the branch laboratories is in the development and improvement of procedures and new methods for diagnosing, preventing, and controlling communicable diseases, and in the dissemination of information of this sort into every community of the state, thereby directly or indirectly touching the welfare of every citizen.

UNITED STATES WEATHER BUREAU

Eric R. Miller, Meteorologist in Charge

The University of Wisconsin has cooperated with the national weather services throughout its history. The first meteorological observations at Madison were made by Professors S. H. Carpenter and J. W. Sterling for the Smithsonian Institution from 1853 to 1864. The services of students were enlisted in the making of these observations, and the names of John Muir and James L. High and other distinguished alumni are found in the meteorological journals kept at Madison. The observations were revived in 1869 by Professor W. W. Daniells, the pioneer professor of agriculture at the University. The Signal Corps, U. S. Army, carried on the observations at Madison from October 1878 to April 1883. On the termination of this governmental office, its instruments were turned over to the Washburn Observatory where the observations were continued until December 1904.

The demands of the public for weather information had become too heavy to be met by the astronomical observatory, so that in September 1904 a branch of the national weather bureau was again established at Madison, in North Hall, where the original observations had been begun 51 years earlier.

This office is fully equipped with standard apparatus, and receives teletype reports hourly. Daily forecasts and weather bulletins are distributed to the press and to aviators and are mailed to the public in central and southwestern Wisconsin. The office is open to the public from 9 a. m. to 4 p. m. daily, except Sundays and holidays.

WASHBURN OBSERVATORY

JOEL STEBBINS, DIRECTOR, PROFESSOR OF ASTRONOMY

The Washburn Observatory was established in the year 1878 through the munificence of the late Governor Cadwallader C. Washburn. Although its obligations and opportunities as a branch of a teaching university have not been ignored, the energies of its staff from the beginning have been directed mainly to astronomical research. Among the lines of research cultivated are the measurement of the positions and motions of the heavenly bodies, the discovery and measurement of double stars, with investigations of their orbits, the study of changes of latitude and the amount and character of the atmospheric refraction, the determination of the amount of the aberration of light, problems of stellar-color, proper motions of faint stars, a systematic investigation of the parallaxes of all accessible stars which have large proper motions, and the photo-electric photometry of variable stars.

The principal instrument of the observatory is a refracting telescope of 15.6 inches aperture, constructed by Alvan Clark & Sons, and provided with a micrometer, a spectroscope, and a photo-electric photometer. The meridian circle by A. Repsold & Sons has a Clark objective with an aperture of five inches. There are also a sidereal clock by Hohwü, two mean clocks by Howard, and chronographs by Fauth and Gaertner. The clocks are compared daily with the radio time signals from Washington.

In the student observatory are a ten-inch refractor with a modern mounting, and a three-inch transit instrument of the broken-telescope type by Bamberg. These instruments, while primarily intended for instruction, are well adapted to and are employed for certain classes of original work. The observatory also possesses a considerable number of subsidiary instruments, such as portable telescopes, photometers, chronometers, sextants, engineers' transits, an altazimuth, a universal instrument, a personal equation machine, calculating machines, photographic and meteorological apparatus, and nautical charts and instruments.

The Woodman Astronomical Library established in connection with the observatory, and supported from the income of a fund given by the late Cyrus Woodman, possesses a large and valuable collection of works upon astronomy and kindred subjects.

The results of important investigations conducted at the Washburn Observatory are published by the state, and fifteen volumes, representing the more important work done, have been issued.

Students of sufficient technical attainment are admitted to the observatory and take part in the investigations in progress. Meritorious original work of such students may be included in the publications of the observatory. For the courses of instruction in astronomy see page 103.

WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

E. F. BEAN, DIRECTOR OF SURVEY AND STATE GEOLOGIST

This Survey has always been closely associated with the University, alike in its inception and operation. Its origin dates from a motion offered by Dr. C. R. Van Hise to the Wisconsin Academy of Sciences in 1893, calling for the appointment of a committee to secure legislation establishing such a survey. The committee, with Dr. Van Hise as chairman, took up the task and finally secured the establishment of the Survey by the legislature of 1897. The president of the University has regularly been the president of the commissioners of the Survey and Dean E. A. Birge was its director from the beginning until 1919, when, as president of the University, he became one of the commissioners. The offices and laboratories of the Survey are in university buildings.

The Survey was at first organized in two divisions—Geology and Natural History; the Legislature of 1909 added a third division by establishing a Soil Survey of the state. From the first much attention was given to highways and a Highway Division was organized in 1907; active work in this field was carried on until 1911, when the legislature created the Highway Commission and made the State Geologist one of its members.

The Geology Division was in charge of Dr. W. O. Hotchkiss from 1906 to 1925; since that date Mr. E. F. Bean has been State Geologist. This is the largest division of the Survey and has issued numerous maps and reports on the general and economic geology of the state. It has investigated also such subjects as water power, under ground waters, peat, and clays. At present, work is being done on the Keweenawan rocks of northern Wisonsin, where copper is the chief mineral possibility. Careful surveys are made of materials available for road construction, with a success which has been worth to the state many hundreds of thousands of dollars annually. The study of underground waters has made the Survey an authority on the the supply of water from artesian wells. Topographic maps of the state which are necessary for all engineering undertakings, are being made in cooperation with the United States Geological Survey. The geography and physical geography of the state have been studied, and numerous bulletins have shown the connection between the geological and the social history of the several regions of Wisconsin.

The Soils Division is carrying on a survey which will result in a complete soil map of the state. The work, which is in charge of Professor A. R. Whitson, is done in cooperation with the United States Department of Agriculture and the College of Agriculture of the University. Soils are studied with reference to their best agricultural use and the fertilizer and other treatment necessary to make them most productive, including a study of the limestones, marls, and by-products from manufacturing plants available as a source of lime. Special attention is given the adaptability of particular soils to special crops such as potatoes, tobacco, and canning crops. Numerous maps and bulletins showing the nature and distribution of the types of soils and their agricultural uses have been published. A reconnaissance survey of the northern part of the state has been completed and detailed county surveys covering a large part of the southern half of the state have been made. A general map and report on the soils of the state was published in 1927.

The Natural History Division is in immediate charge of Dr. Birge, President-Emeritus of the University. It has issued numerous bulletins on specific topics relating to the botany and zoology of the state. Its main continuous work has been on the inland lakes. Many hydrographic maps have been made, as well

as studies of the temperatures of the lakes, the chemical composition of their waters, and the plants and animals inhabiting them. The main problem to which all these studies lead is that of the nature and quantity of the fundamental food supply of the lakes, its variation with season and year, and the resulting economic value of the lakes.

During the summer months the Survey employs university students as assistants in field work. This arrangement enables students to gain practical experience during their university careers. The close cooperative relationship existing between the University and the Survey is very valuable to both.

STATE OF WISCONSIN GENERAL HOSPITAL

R. C. Buerki, Superintendent

The State of Wisconsin General Hospital is established in connection with the Medical School of the University of Wisconsin. The University Infirmary and the Mary Cornelius Bradley Memorial Hospital, previously established, are integral parts of the Hospital (Sec. 36.21, Stat. 1923). The new Children's Orthopedic Hospital (Sec. 36.32, Stat. 1929) is closely affiliated.

The main hospital building is designed as a memorial to those who served in the World War. It was built and equipped from the balance in the Service Recognition Fund (Chapter 20, Spl. S., 1920).

The chief purposes of the hospital are defined as follows: (1) Primarily for the care of persons afflicted with a malady, deformity, or ailment of a nature which probably can be remedied by hospital service and treatment, who would be unable otherwise to secure such care. (2) For such instruction of medical students, physicians, and nurses and for such scientific research as will promote the welfare of the patients committed to its care and assist in the application of science to the alleviation of human suffering (Sec. 36.31, Stat. 1923).

In addition, a limited number of patients able to pay for care are also admitted. The hospital is therefore primarily interested in the type of case who is unable to pay for hospital care and who can be benefited by care. All types of cases are accepted at the hospital with the exception of frank pulmonary tuberculosis. These cases, it is felt, can best be treated in the local sanatoria and as soon as a patient who has been admitted to the hospital is diagnosed as such he is recommended for transfer. During the last eight years over 50,000 different patients coming from all sections of the state have received treatment at the State of Wisconsin General Hospital. The present bed capacity of the hospitals is over 600.

The new Orthopedic Hospital has increased the number of orthopedic cases that can be hospitalized at the University. In this unit adequate facilities are provided not only for the actual medical and surgical care necessary, but also classroom space for general education and occupational therapy. It is planned to cooperate with the local schools for crippled children throughout the state by returning the patient to his community as early as possible, thereby reducing the cost of care to both state and county.

STATE TOXICOLOGICAL LABORATORY

R. P. Herwick, State Toxicologist

The office of state toxicologist was established in 1923 by act of the legislature. In many instances prior to the establishment of this office, cases of apparent criminal poisoning were not investigated because of the inability of the county to employ trained and competent experts. The high cost of such assistance was sufficient to make it almost prohibitive for some of the less densely populated counties. To prevent miscarriage of justice in such instances, and to render expert assistance available to all district attorneys, the legislature created this offce.

The chief function of the State Toxicologist is to assist the district attorneys in the detection of criminal poisoning. There are also other ways in which this office assists in protecting the people of Wisconsin.

This office has been of aid to various state departments, such as the State Department of Agriculture in connection with the poisoning of stock and other domestic animals; the State Industrial Commission in connection with cases of suspected industrial poisoning; the State Conservation Commission in the detection of poisoning of wild game; and the State Board of Health in cases of food poisoning. In general, it is the duty of the State Toxicologist to protect the people of the state from criminal or accidental poisoning, so far as he is able. The State Toxicologist also assists the staff of the Wisconsin General Hospital in the diagnosis and treatment of cases of poisoning.

The laboratory of the State Toxicologist is located in the Service Memorial Institutes Building in conjunction with the laboratories of the Department of Pharmacology of the Medical School.

WISCONSIN PSYCHIATRIC INSTITUTE

W. F. Lorenz, Director, Professor of Neuropsychiatry

The Wisconsin Psychiatric Institute was originally developed under the Board of Control of the State of Wisconsin. It was started in 1915 at Mendota, but on July 1, 1925, was transferred by legislative act to the University. Its principal purpose is to investigate causes of insanity and allied conditions which directly or indirectly result in state care and, in addition, to initiate and promote measures of relief and prevention when practically possible.

As the result of an investigation started in 1915, syphilis was found to be a large single factor in causing both insanity and mental enfeeblement in the state of Wisconsin. In an effort to meet this situation in a practical way, an attempt was made to assist the physicians throughout the state to recognize and thoroughly treat syphilis with the hope of preventing the late consequences of this disease. A blood-examining service was instituted and made available, without cost, to physicians of Wisconsin. Since 1915, over 498,000 individual tests have been made for practicing physicians of Wisconsin. This number does not include the service that has been rendered to state institutions; with this number added the total exceeds 751,000. The results of this effort accounts, in great measure, for the reduction of paresis in Wisconsin. This is shown by the admission rate to state hospitals, for while in 1915, and previously, the admission rate for this form of insanity was over 12%, since 1924 it has continued at less than 6%.

In addition, cerebro-spinal fluid is examined without charge for practicing physicians of Wisconsin, and, since 1925, chemical blood examinations have been added as a service to physicians. This latter effort was made possible as the result of an extensive investigation from which was developed a blood preservative that permits shipment of this material by mail without deterioration. Since 1925, over 77,000 blood specimens have been received for this examination.

All the laboratory work combined makes available to practicing physicians highly specialized laboratory procedures which are valuable aids to him in recognizing and treating diseases and, incidentally, because the effort is centralized, it promotes technical efficiency and is most economical.

The Institute also serves the State Board of Control as a special institution for the investigation of medical and medico-social problems arising in the administration of the state charitable and penal institutions. The Director of the Institute serves as a medical consultant to the Board of Control.

The medical personnel of the Institute comprises the staff of the Department of Neuropsychiatry in the Medical School of the University. Its five members administer this department in the State of Wisconsin General Hospital and teach nervous and mental diseases to medical students. For this purpose it has available 40 beds in the Bradley Memorial Hospital. During the year ending December, 1931, there were admitted 682 new cases and 94 re-admissions covering a wide range of cases and including practically every known variety of mental and nervous disorder. The psychiatric cases constitute about 35% of the admissions. The neurological cases afford ample material for study of central nervous system syphilis (92 cases), including a large group of congenital cases, upon which special work is being done; encephalitis (50 cases); brain tumor (19 cases); and among the less common disorders: pellagra, Huntington's chorea, myasthenia gravis, and the neuritic form of progressive muscular atrophy. Owing to the practice of bedside instruction which each medical student gets, this volume and variety offers an unusual opportunity for clinical instruction. It also provides that which few general hospitals offer,—training in this specialty for nurses, internes, and resident physicians.

A service which this department affords the community is developing into unusual proportions. Through the outpatient department there has been an increasing demand for guidance in cases of conduct disorder. From the criminal and juvenile courts, the Juvenile Protective Association, the Public Welfare Association, the Children's Home Finding Society, and the Public Health Nursing Association are referred many behavior problems. This service is being extended to other communities outside of Madison.

In cooperation with the University Department of Student Health many students are examined and advised. This consultation service, in not only psychiatry but in neurology also, is extended to all departments of the State of Wisconsin General Hospital.

The wealth of material in nervous and mental diseases offers many problems for research, and definite contributions have been made, particularly in the field of therapy.

STATE HISTORICAL SOCIETY

JOSEPH SCHAFER, SUPERINTENDENT

This Society, organized in the early part of 1849, in the course of its more than eighty years of activity, has attained an enviable position among the educational institutions of the state and nation. The Society maintains in its building on the campus of the University the State Historical Library containing 255,000 volumes and 275,000 pamphlets; also the Historical Museum on the fourth floor of the library building; and an active research and publications staff dealing with Wisconsin history. Its publications include the *Wisconsin Magazine of History,* a quarterly now in its fifteenth volume; *Wisconsin Historical Collections,* of which thirty-one volumes have been issued in addition to a general index of volumes I-XX; the *Proceedings,* separate annual publications containing reports with occasional historical papers; *Bulletins of Information* numbers 1-98; *The Calendar Series* of which three volumes of calendars of the Draper papers have been published; *An Economic History of Wisconsin* by Frederick Merk; *The Wisconsin Domesday Book, General Series,* Volume I to III, and *Town Studies,* Volume I; *Wisconsin History Series, The French Regime in Wisconsin and the Northwest,* Kellogg; *Wisconsin Gold Star List,* Gregory; *Carl Schurz, Militant Liberal* (biography), Schafer.

The State Historical Library is unequaled in the field of Western history and has one of the most important newspaper and periodical collections in the United States. In local history, biography, American travels, etc., it is exceptionally well equipped. The printed colonial records and government documents, state and federal, are equally satisfactory. For the study of upland Virginia, North and South Carolina, and Georgia, as well as Kentucky and Tennessee and the old Northwest, in the Colonial and Revolutionary period, the Draper manuscripts in this library are the richest collection extant. Resources for the study of the slavery question and the Civil War are notable and there is a vast amount of manuscript material on Western economic history, particularly the trade in lumber and furs. A collection of immigrant letters is forming.

For English history and government, the library has the usual sets of official publications, including the Rolls Series, the Calendars of State Papers, the Blue Books, the reports of the Historical Manuscripts Commission, and other reports of the Records Commission; also the parliamentary proceedings, and the publications of many historical societies. For the study of Dutch history and institutions the Tank collection offers special resources.

This library contains one of the three greatest collections of newspapers in the United States and it has the fullest files of labor papers to be found anywhere in the country. It is the custodian of the extensive collection of labor and employers' papers, convention proceedings, agreements, etc., secured through the American Bureau of Industrial Research.

WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS

LOWELL E. NOLAND, SECRETARY, ASSOCIATE PROFESSOR OF ZOOLOGY

The act incorporating the Wisconsin Academy of Sciences, Arts, and Letters was approved by the State Legislature on March 16, 1870. The charter states that the general objects shall be to encourage investigation and to disseminate correct views in the various departments of science, literature, and the arts.

Among the various special objects mentioned in the charter and in the constitution of the Academy are the publication of the results of investigations and the formation of a library. The former object is attained through a regular publication known as the Transactions; in the sixty-one years of its existence the Academy has published thirty-two volumes of its Transactions. This publication is sent to all active members gratis, and it is also sent to similar societies in all parts of the world in exchange for the publications issued by them; in this manner a large, valuable, and rapidly growing library has been secured. This library is deposited in the university library and its books are loaned on the same terms as those of the latter.

Throughout its existence the Academy has been closely associated with the University in various ways. Several of the leading charter members belonged to the university faculty and a large percentage of the past and present active members have come from the faculty of the University. Ten of the twenty-one individuals who have served as presidents of the Academy were members of the university faculty at the time of their election.

Meetings are held annually, ordinarily during the spring recess of the University. The Academy is affiliated with the American Association for the Advancement of Science.

MUSEUMS

The museums of the University are principally illustrative collections for use in connection with the work of instruction in the various departments. Worthy of special mention are the collection of chemical products; the extensive drug collection of the Pharmacy Department; the herbarium, containing a rich array of Wisconsin flowering plants, fleshy fungi, and mosses; the geological museum, containing very extensive collections of minerals, rocks, ores, and fossils, including thin sections; and the valuable collections of the Department of Art History and Criticism, which embraces a series of prints illustrating the development of the graphic arts and a very large number of facsimile and photographic reproductions of paintings and drawings by artists of all periods.

The State Historical Museum which, though not administered by the University, is open to the use of its students for purposes of study and research, makes a specialty of the archaeology and social history of the western Indians and of the western pioneer life, especially in Wisconsin, and is notable for its collections illustrating the early history of the upper Mississippi valley. The art collections contain modern pictures of merit, a collection of Piranesi etchings of classical ruins, and a collection of good prints and reproductions valuable for study. Art exhibits are held in the auditorium of the museum.

PART X—STATISTICAL TABLES

DEGREES ACCORDING TO COURSES

	1854–1931	1931
NUMBER OF FIRST DEGREES GRANTED 1854-1931	30,046	1,640
PRESENT COURSES		
General B. A., 1904-1931	10,709	705
Course in Commerce, B. A., 1904-1931	1,998	115
Course in Journalism, B.A., 1914-1931	607	63
Course in Humanities, B.A., 1922-1931	59	4
Normal Course, Ph.B., 1898-1931	1,085	52
General Course, Ph.B., 1917-1931	617	93
Chemistry Course, B.S., 1909-1931	370	25
Chemistry-Commerce Course, B.S., 1927-1931	24	3
Physical Education Course, B.S., 1920-1931	323	41
Applied Arts Course, B.S., 1922-1931	233	29
Industrial Education Course, B.S., 1922-1931	67	6
Medical Science Course, B.S., 1909-1931	701	36
Hygiene Course, B.S., 1927-1931	23	11
Four-Year Pharmacy Course, B.S., 1895-1931	156	2
Three-Year Pharmacy Course, Ph.G., 1884-1931	516	21
Music Course, B.M., 1917-1931	225	36
Four-Year Course in Agriculture, B.S., 1878-1931	1,668	56
Home Economics Course, B.S., 1909-1931	1,117	71
Two-Year Course in Agriculture, 1910-1931	243*	2*
Law Course, LL.B., 1869-1931	2,779	107
Civil Engineering Course, B.S., 1876-1931	1,147	50
Mechanical Engineering Course, B.S., 1876-1931	947	43
Electrical Engineering Course, B.S., 1892-1931	1,267	50
Chemical Engineering Course, B.S., 1903-1931	401	15
Mining Engineering Course, B.S., 1910-1931	140	6
Metallurgical Engineering Course, B.S., 1930	2	0
COURSES DISCONTINUED		
Ancient Classical Course, B.A., 1854-1903	470	
Modern Classical Course, B.L., 1886-1903	548	
English Course, B.L., 1887-1903	459	
Civil Historical Course, B.L., 1893-1903	383	
General Science Course, B.S., 1886-1903	722	
Geology Course, B.S., 1914	1	
School of Music, M.G., 1898-1916	134	
School of Commerce (B.L., 8; B.S., 1) 1902-1903	9	
Normal Course, 1865-1868	25	
Metallurgical Engineering Course, B.M.E., 1876-1896	16	
General Engineering Course, B.S., 1901-1910	96	
Manual Arts Course, B.S., 1921	2	
Two-Year Course in Home Economics, Ag.G., 1920-1922	8*	
Two-Year Course for Supervisors of Music, 1910-1925	173*	
Three-Year Course for Supervisors of Music, 1925	4*	
NUMBER OF HIGHER DEGREES GRANTED IN COURSE 1875-1931	7,247	552
Master of Arts, M.A., 1879-1931	3,150	203
Master of Letters, M.L., 1882-1903	97	
Master of Science, M.S., 1882-1931	1,496	96
Master of Science, Engineering, M.S., 1922-1931	155	21
Engineer, 1875-1931	435	12
Master of Agriculture, M.Agr., 1893	1	
Master of Pharmacy, M.Phar., 1894 and 1902	2	
Master of Philosophy, M.Ph., 1902-1931	322	47
Master of Public Health, M.P.H., 1915-1916	4	

Doctor of Public Health, D.P.H., 1912-1915	2	
Doctor of Philosophy, Ph.D., 1892-1931	1,407	129
Doctor of Medicine, M.D., 1927-1931	176	44

KINDS OF DEGREES

NUMBER OF FIRST DEGREES GRANTED, 1854-1931		30,046
Bachelor of Arts, 1854-1931	13,843	
Bachelor of Philosophy, 1898, 1931	1,702	
Bachelor of Letters, 1876-1903	1,398	
Bachelor of Science, 1873-1931	9,408	
Bachelor of Metallurgical Engineering, 1876-1896	16	
Bachelor of Laws, 1869-1931	2,779	
Bachelor of Music, 1917-1931	225	
Graduate in Music, 1896-1916	134	
Normal Course, 1865-1868	25	
Graduate in Pharmacy, 1884-1931	516	
Graduate in Agriculture (Two-Year Course) 1910-1931	251*	
Music Supervisor, 1910-1925	177*	
NUMBER OF HIGHER DEGREES GRANTED IN COURSE, 1875-1931		7,247
Masters, 1879-1931	5,227	
Engineer, 1875-1931	435	
Doctor of Public Health, 1912-1915	2	
Doctor of Philosophy, 1892-1931	1,407	
Doctor of Medicine, 1927-1931	176	
GRAND TOTAL OF FIRST AND HIGHER DEGREES GRANTED, 1854-1931		37,293

HONORARY DEGREES

	1856–1931	1931
Doctor of Letters, 1910-1930	19	
Doctor of Laws, 1866-1931	131	3
Doctor of Science, 1910-1931	25	1
Doctor of Philosophy, 1883-1887	4	
Doctor of Medicine, 1856	1	
Master of Arts, 1867-1931	33	1
Master of Science, 1877	1	
Civil Engineer, 1877-1915	4	
Mechanical Engineer, 1898-1928	2	
Bachelor of Arts, 1885	1	
Bachelor of Mechanical Engineering, 1887	1	
	222	5

*Not included in totals because not considered as degrees.

SUMMER SESSION, 1931

	GRADUATES												UNDER-GRADUATES			GRAND TOTAL		
	Six-Week Session			Nine-Week Session			Not Registered in Graduate School			Total Graduates								
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
Letters and Science*	273	348	621	198	102	300	81	202	283	552	652	1,204	841	1,164	2,005	1,393	1,816	3,209
Engineering	3	0	3	1	0	1	2	0	2	6	0	6	262	1	263	268	1	269
Agriculture	58	56	114	10	3	13	2	44	46	70	103	173	34	92	126	104	195	299
Education	194	167	361	131	22	153	60	146	206	385	335	720	106	372	478	491	707	1,198
Law													107	6	113	107	6	113
GRAND TOTAL	528	571	1,099	340	127	467	145	392	537	1,013	1,090	2,103	1,350	1,635	2,985	2,363	2,725	5,088
Deducting Students in attendance during the regular year:																		
Letters and Science*	72	28	100	63	9	72	13	3	16	148	40	188	399	255	654	547	295	842
Engineering	1	0	1	0	0	0	2	0	2	3	0	3	206	1	207	209	1	210
Agriculture	23	6	29	2	2	4	2	0	2	27	8	35	23	40	63	50	48	98
Education	14	12	26	16	4	20	0	2	2	30	18	48	35	70	105	65	88	153
Law													46	0	46	46	0	46
Total Deducted	110	46	156	81	15	96	17	5	22	208	66	274	709	366	1,075	917	432	1,349
NET TOTAL	418	525	943	259	112	371	128	387	515	805	1,024	1,829	641	1,269	1,910	1,446	2,293	3,739

*Includes Medicine, Nursing, Music, Library School, and Industrial Workers.

SUMMARY OF STUDENTS BY ACADEMIC

DIVISION	Men	Women	Total	Men	Women	Total
GRADUATE SCHOOL	Fellows			Scholars		
1. Letters and Science	46	13	59	23	10	33
2. Engineering	9	0	9	2	0	2
3. Agriculture	39	4	43	5	0	5
4. Home Economics	0	1	1	0	1	1
5. School of Education[a]	1	2	3	1	1	2
6. Total Graduate School	95	20	115	31	12	43
PROFESSIONAL SCHOOLS	Fourth Year			Third Year		
7. Law				78	3	81
8. Medicine	49	4	53	48	2	50
UNDERGRADUATES	Seniors			Juniors		
College of Letters and Science Courses						
9. B.A. General Course	442	288	730	251	250	501
10. Ph.B. General Course	118	11	129	84	9	93
11. Chemistry Course	40	5	45	28	4	32
12. Chemistry-Commerce Course	9	0	9	14	2	16
13. Course in Humanities	3	3	6	5	5	10
14. Hygiene Course	0	19	19	0	14	14
15. Normal Course	4	31	35	0	0	0
16. Pharmacy III				13	0	13
17. Pharmacy IV	7	1	8	9	0	9
18. Premedical Course	21	1	22	81	5	86
19. Experimental College						
Schools						
20. Commerce—B.A.	135	23	158	104	13	117
21. Commerce—Ph.B.	3	0	3	6	0	6
22. Journalism	45	28	73	38	39	77
23. Music	3	32	35	13	16	29
24. Total 9-23 incl.	830	442	1272	646	357	1003
COLLEGE OF ENGINEERING						
25. Chemical Engineering	33	0	33	52	0	52
26. Civil Engineering	61	0	61	80	1	81
27. Electrical Engineering	70	1	71	76	0	76
28. Mechanical Engineering	58	0	58	72	0	72
29. Mining Engineering	11	0	11	9	0	9
30. Total 25-29 incl.	233	1	234	289	1	290
COLLEGE OF AGRICULTURE						
31. Long Course—4 yr.	80	1	81	89	1	90
32. Middle Course—2 yr.						
33. Home Economics	0	89	89	0	75	75
34. Total 31-33 incl.	80	90	170	89	76	165
SCHOOL OF EDUCATION						
[b]35. *Teachers' Certificates only*	*13*	*39*	*52*			
36. School of Education	41	165	206	36	118	154
37. Art Education	16	33	49	6	35	41
38. Industrial Education	6	0	6	1	0	1
39. Physical Education	32	35	67	16	29	45
40. Total 36-39 incl.	95	233	328	59	182	241
SCHOOL OF NURSING						
[b]41. *Hygiene Course*	*0*	*19*	*19*	*0*	*14*	*14*
42. Graduate Nurse				0	23	23
[b]43. *Total 41 and 42*	*0*	*19*	*19*	*0*	*37*	*37*
44. **Library School**	0	16	16			
45. Total Undergraduates (24, 30, 34 40, 42, and 44)	1,238	782	2,020	1,083	639	1,722
46. GRAND TOTAL (Graduates, Undergraduates, and Professional—6, 7, 8, & 45)						
47. TWICE-COUNTED (See table p. 458)						
48. NET GRAND TOTAL—Graduates, Undergraduates, and Professional (46 minus 47)						

[a]For total enrollment in School of Education see table p. 457.
[b]Figures in italics are not carried into totals because already included in table.

CLASSES, COURSES, AND SEX

YEAR, 1931-32

Graduates						TOTALS			
Men	Women	Total	Men	Women	Total	Men	Women	Total	Item
548	275	823				617	298	915	1
84	0	84				95	0	95	2
149	12	161				193	16	209	3
0	20	20				0	22	22	4
76	62	138				78	65	143	5
857	369	1,226				983	401	1,384	6
Second Year			First Year						
80	6	86	112	5	117	276	14	290[c]	7
104	7	111	97	5	102	298	18	316	8
Sophomores			Freshmen						
380	440	820	438	510	948	1,520	1,498	3,018[d]	9
113	20	133	143	12	155	459	52	511[d]	10
37	0	37	33	6	39	138	15	153	11
11	0	11	8	0	8	42	2	44	12
3	12	15	3	5	8	14	25	39	13
0	13	13	0	15	15	0	61	61	14
0	0	0	0	0	0	4	31	35	15
14	0	14	17	1	18	46	1	47[d]	16
4	1	5	9	2	11	30	4	34[d]	17
103	12	115	143	14	157	348	32	380	18
66	0	66				67	0	67[d]	19
						239	36	275	20
						9	0	9	21
						83	67	150	22
7	22	29	10	18	28	36	102	138[d]	23
738	520	1,258	804	583	1,387	3,035	1,926	4,961	24
39	2	41	48	0	48	172	2	174	25
66	0	66	71	0	71	279	1	280[d]	26
89	0	89	75	0	75	310	1	311	27
89	0	89	82	0	82	303	0	303[d]	28
12	0	12	12	0	12	44	0	44	29
295	2	297	288	0	288	1,108	4	1,112[d]	30
73	4	77	73	0	73	317	6	323[d]	31
3	0	3	3	0	3	6	0	6	32
0	78	78	0	80	80	0	322	322	33
76	82	158	76	80	156	323	328	651[d]	34
						13	*39*	*52*	*35*
						77	283	360	36
8	49	57	12	39	51	44	156	200[d]	37
						7	0	7	38
23	36	59	49	31	80	121	131	252[d]	39
31	85	116	61	70	131	249	570	819[d]	40
0	*13*	*13*	*0*	*15*	*15*	*0*	*61*	*61*	*41*
0	14	14	0	28	28	0	66	66[d]	42
0	*27*	*27*	*0*	*43*	*43*	*0*	*127*	*127*[d]	*43*
						1	41	42[d]	44
1,140	703	1,843	1,229	761	1,990	4,716	2,935	7,651[d]	45
						6,273	3,368	9,641	46
						256	30	286	47
						6,017	3,338	9,355	48

[c]Includes four first year specials and two second year specials.
[d]Includes adult specials or unclassified or both not itemized except special table p. 459.

ADDITIONAL ENROLLMENT—COLLEGE OF AGRICULTURE

	Men	Women	Total
Short Course			
Second Year	44	0	44
First Year	64	1	65
Total Short Course	108	1	109
Winter Dairy Course	40	0	40
Deducting those in attendance during regular year	1	0	1
Net Total Winter Dairy Course	39	0	39
Net Total Short and Dairy Courses	147	1	148

NET ENROLLMENT—REGULAR YEAR, SUMMER SESSION, AND DAIRY COURSES

	Men	Women	Total
Regular Year	6,017	3,338	9,355
Summer Session	1,446	2,293	3,739
Short and Dairy Courses	147	1	148
GRAND NET TOTAL, Excluding Extension Students	7,610	5,632	13,242

EXTENSION DIVISION (Extra-Mural College)

	Men	Women	Total*
Correspondence Study Department	5,041	3,318	8,359
Extension Classes	5,119	4,440	9,559
Milwaukee Center (Resident Students)	621	165	786

*This total enrollment comprises those who have enrolled for correspondence instruction within the fiscal year up to June 1, 1932, and also those carried over who had enrolled prior to July 1, 1931, but whose registrations were then in force and whose time limit for completion of work had not terminated. Correspondence study enrollments are made at any time throughout the year. Extension classes include registrations to June 1, 1932.

SCHOOL OF EDUCATION, 1931-32

TEACHERS' CERTIFICATES	Men	Women	Total
L S Graduate	1	2	3
Seniors			
General Course, B.A.	3	1	4
General Course, Ph.B.	0	1	1
Chemistry Course	2	1	3
Course in Humanities	0	2	2
Normal Course	1	7	8
School of Commerce	3	4	7
School of Journalism	1	3	4
School of Music	2	18	20
Total Teachers' Certificates	13	39	52
COURSES			
School of Education	77	283	360
Art Education	44	156	200
Industrial Education	7	0	7
Physical Education	121	131	252
Total Courses	249	570	819
GRAND TOTAL, Teachers' Certificates and Courses	262	609	871

TWICE COUNTED STUDENTS, 1931-32

The item of 286 twice counted occurs because of double classification as follows:

	Men	Women	Total
Law 1 and L S Grad	1	0	1
Law 1 and Engr Grad	2	0	2
Law 1 and L S 4	39	2	41
Law 1 and Gen C 4	14	0	14
Law 2 and L S 4	12	0	12
Law 2 and Gen C 4	5	0	5
Law 2 and S C 4	1	0	1
Law 3 and L S 4	4	0	4
Law 3 and Gen C 4	2	0	2
Law 3 and S J 4	0	1	1
Law 3 and C E 4	1	0	1
Law 1 Special and L S 3	1	0	1
Law 1 Special and Gen C 3	1	0	1
Totals	83	3	86
Med 1 and L S Scholar	1	0	1
Med 1 and L S Grad	7	0	7
Med 1 and L S 4	58	4	62
Med 1 and L S 3	15	1	16
Med 2 and L S Grad	15	2	17
Med 2 and L S 4	73	3	76
Med 3 and L S Grad	1	0	1
Med 3 and L S 4	3	0	3
Totals	173	10	183
Gr N 3 and L S Grad	0	1	1
Library School and L S 4	0	16	16
GRAND TOTAL	256	30	286

SPECIAL STUDENTS, 1931-32

	Unclassified			Adult Specials								
				2nd Year			1st Year			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
College of Letters and Science												
General Course, B.A.				4	4	8	5	6	11	9	10	19
General Course, Ph.B.				0	0	0	1	0	1	1	0	1
Course in Pharmacy, 3 yr.				0	0	0	2	0	2	2	0	2
Course in Pharmacy, 4 yr.				0	0	0	1	0	1	1	0	1
Experimental College				1	0	1	0	0	0	1	0	1
Music	3	14	17	0	0	0	0	0	0	0	0	0
College of Engineering												
Civil Engineering				0	0	0	1	0	1	1	0	1
Mechanical Engineering				0	0	0	2	0	2	2	0	2
College of Agriculture												
Long Course				1	0	1	1	0	1	2	0	2
School of Education												
Art Education				1	0	1	1	0	1	2	0	2
Physical Education				0	0	0	1	0	1	1	0	1
Graduate Nurse Course				0	0	0	0	1	1	0	1	1
Library School	1	25	26									
Totals	4	39	43	7	4	11	15	7	22	22	11	33

SUMMARY OF STUDENTS BY STATES, FOREIGN COUNTRIES, AND SEX

Regular Year, Summer Session only, Short and Dairy Courses

1931-32

State	Total			Regular Year			Summer Session 1931 only			Short and Dairy Courses		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
Alabama	4	9	13	3	6	9	1	3	4	0	0	0
Arizona	9	4	13	6	2	8	3	2	5	0	0	0
Arkansas	9	17	26	4	10	14	5	7	12	0	0	0
California	18	30	48	10	15	25	8	15	23	0	0	0
Colorado	13	10	23	9	5	14	4	5	9	0	0	0
Connecticut	21	13	34	15	6	21	6	7	13	0	0	0
Delaware	2	1	3	1	1	2	1	0	1	0	0	0
District of Columbia	9	13	22	4	8	12	5	5	10	0	0	0
Florida	9	11	20	5	5	10	4	6	10	0	0	0
Georgia	6	11	17	3	4	7	3	7	10	0	0	0
Idaho	10	3	13	9	3	12	1	0	1	0	0	0
Illinois	526	710	1,236	356	321	677	164	389	553	6	0	6
Indiana	98	181	279	33	64	97	62	117	179	3	0	3
Iowa	78	143	221	35	59	94	43	84	127	0	0	0
Kansas	43	81	124	20	23	43	23	58	81	0	0	0
Kentucky	26	18	44	15	5	20	11	13	24	0	0	0
Louisiana	18	15	33	3	5	8	15	10	25	0	0	0
Maine	7	3	10	4	0	4	3	3	6	0	0	0
Maryland	7	9	16	5	4	9	2	5	7	0	0	0
Massachusetts	29	41	70	23	23	46	6	18	24	0	0	0
Michigan	87	179	266	45	62	107	41	117	158	1	0	1
Minnesota	90	108	198	53	48	101	37	60	97	0	0	0
Mississippi	12	14	26	7	3	10	5	11	16	0	0	0
Missouri	77	130	207	41	43	84	36	87	123	0	0	0
Montana	14	14	28	11	9	20	3	5	8	0	0	0
Nebraska	41	37	78	16	11	27	25	26	51	0	0	0
Nevada	0	1	1	0	0	0	0	1	1	0	0	0
New Hampshire	4	2	6	4	2	6	0	0	0	0	0	0
New Jersey	59	30	89	52	25	77	7	5	12	0	0	0
New Mexico	5	4	9	3	0	3	2	4	6	0	0	0
New York	230	163	393	191	105	296	38	58	96	1	0	1
North Carolina	8	2	10	5	1	6	3	1	4	0	0	0
North Dakota	18	25	43	9	12	21	9	13	22	0	0	0
Ohio	164	209	373	87	79	166	77	130	207	0	0	0
Oklahoma	25	27	52	9	10	19	16	17	33	0	0	0
Oregon	15	8	23	14	3	17	1	5	6	0	0	0
Pennsylvania	86	153	239	56	49	105	30	104	134	0	0	0
Rhode Island	5	4	9	5	2	7	0	2	2	0	0	0
South Carolina	7	5	12	1	1	2	6	4	10	0	0	0
South Dakota	31	27	58	21	12	33	9	15	24	1	0	1
Tennessee	13	20	33	1	9	10	12	11	23	0	0	0
Texas	29	44	73	6	8	14	23	36	59	0	0	0
Utah	11	3	14	9	2	11	2	1	3	0	0	0

Vermont	3	1	4	3	1	4	0	0	0	0	0	0
Virginia	5	7	12	3	2	5	2	5	7	0	0	0
Washington	11	4	15	9	2	11	2	2	4	0	0	0
West Virginia	19	32	51	3	4	7	16	28	44	0	0	0
Wisconsin	5,470	3,033	8,503	4,683	2,247	6,930	653	785	1,438	134	1	135
Wyoming	1	1	2	0	1	1	1	0	1	0	0	0
Total United States	7,482	5,610	13,092	5,910	3,322	9,232	1,426	2,287	3,713	146	1	147
Australia	1	0	1	1	0	1	0	0	0	0	0	0
Belgium	0	1	1	0	1	1	0	0	0	0	0	0
Bolivia	1	0	1	1	0	1	0	0	0	0	0	0
Brazil	1	0	1	1	0	1	0	0	0	0	0	0
Bulgaria	1	0	1	1	0	1	0	0	0	0	0	0
Canada	28	3	31	28	3	31	0	0	0	0	0	0
Chile	2	0	2	2	0	2	0	0	0	0	0	0
China	19	2	21	19	2	21	0	0	0	0	0	0
Czechoslovakia	1	0	1	1	0	1	0	0	0	0	0	0
Denmark	1	0	1	1	0	1	0	0	0	0	0	0
Egypt	1	0	1	1	0	1	0	0	0	0	0	0
England	3	2	5	3	2	5	0	0	0	0	0	0
Esthonia	0	1	1	0	1	1	0	0	0	0	0	0
France	0	2	2	0	2	2	0	0	0	0	0	0
Germany	5	0	5	5	0	5	0	0	0	0	0	0
Guatemala	1	0	1	0	0	0	0	0	0	1	0	1
Hawaii	2	1	3	2	1	3	0	0	0	0	0	0
India	1	0	1	1	0	1	1	0	0	0	0	0
Japan	1	2	3	1	2	3	0	0	0	0	0	0
Jugoslavia	1	0	1	1	0	1	0	0	0	0	0	0
Korea	1	0	1	1	0	1	0	0	0	0	0	0
Mexico	5	0	5	5	0	5	0	0	0	0	0	0
New Zealand	1	0	1	1	0	1	0	0	0	0	0	0
Nicaragua	1	0	1	1	0	1	0	0	0	0	0	0
Norway	1	0	1	1	0	1	0	0	0	0	0	0
Panama Canal Zone	1	1	2	1	1	2	0	0	0	0	0	0
Peru	1	0	1	1	0	1	0	0	0	0	0	0
Persia	2	0	2	2	0	2	0	0	0	0	0	0
Philippine Islands	10	0	10	10	0	10	0	0	0	0	0	0
Porto Rico	1	0	1	1	0	1	0	0	0	0	0	0
Russia	5	0	5	5	0	5	0	0	0	0	0	0
Scotland	1	0	1	1	0	1	0	0	0	0	0	0
Siam	1	0	1	1	0	1	0	0	0	0	0	0
South Africa	2	0	2	2	0	2	0	0	0	0	0	0
Switzerland	1	0	1	1	0	1	0	0	0	0	0	0
Turkey	3	0	3	3	0	3	0	0	0	0	0	0
Ukraine	1	0	1	1	0	1	0	0	0	0	0	0
Uruguay	0	1	1	0	1	1	0	0	0	0	0	0
TOTAL FOREIGN	108	16	124	107	16	123	0	0	0	1	0	1
TOTAL WISCONSIN	5,470	3,033	8,503	4,683	2,247	6,930	653	785	1,438	134	0	134
TOTAL OTHER STATES	2,012	2,577	4,589	1,227	1,075	2,302	773	1,502	2,275	12	1	13
GRAND TOTAL	7,590	5,626	13,216	6,017	3,338	9,355	1,426	2,287	3,713	147	1	148

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