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CATALOGUE

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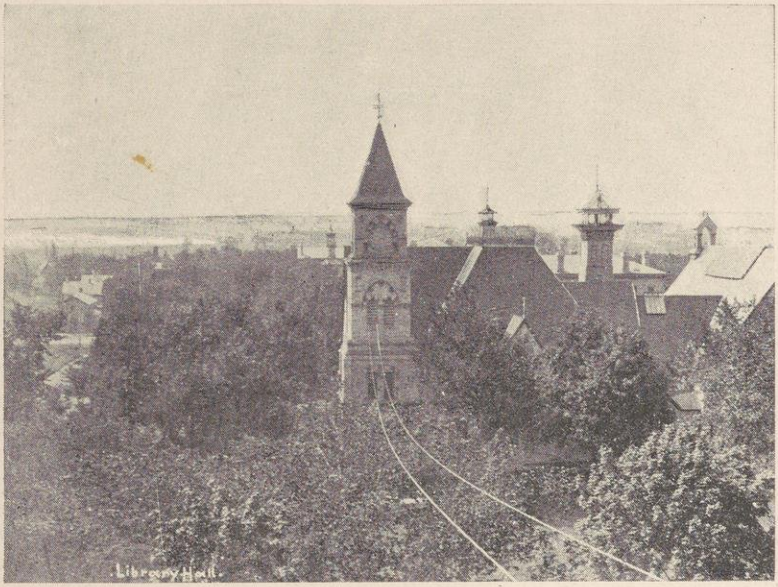
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OF THE

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President of the University, Office, University Hall.

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Professor of Civil Polity and Political Economy, Room 14,
University Hall.

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Professor of Agricultural Chemistry, and Chief Chemist to the
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Professor of Botany, Room 39, Science Hall.

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Instructor in Latin, Room 16, University Hall.

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Instructor in Physics, Room 17, Science Hall.

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Instructor in Elocution, Room 4, University Hall.

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Instructor in Elementary Law, Room 16, University Hall.

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Instructor in Music, Room 15, Ladies' Hall.

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Instructor in German, Rooms 8 and 10, North Hall.

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Gilbert Ernstein Roe, Madison.
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Eugene Cooper Rowley, Madison.
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Henry Currier Wilson, Prescott.
Frank Morgan Wootton, Madison.
Albert Gregory Zimmerman, Madison.

SECOND DEGREES.

(*On examination and presentation of thesis.*)

MASTER OF ARTS.

James Bremer Kerr, B. A., 1889—In Greek.
Thesis: "The Sociology of Plato's Republic."
Wilbur S. Tupper, B. A. and B. L., 1886—In Civics.
Thesis: "The Origin of Equity Jurisprudence."

MASTER OF LETTERS.

Harriet Trayne Remington, B. L., 1888—In Latin.
Thesis: "The Relative Order of Adjective and Substantive in the Works of Sallust."
James B. Hutchinson, B. L., 1885—In Italian.
Thesis: "La Divina Comedia: l'Inferno."

MASTER OF SCIENCE.

Harry Luman Russell, B. S., 1888—In Natural History.
Thesis: "A Study of Certain Saccharomyces-like Organisms."

MASTER OF LETTERS.
(In English.)

John A. Hancock, A. B., B. S., A. M. (Baker University)—In Pedagogy.
Thesis: "The Secularization of Politics."

MECHANICAL ENGINEER.

(*In Course.*)
Frank Gatlin Hobart, B. M. E., 1886.

CIVIL ENGINEER.

(*In Course.*)
Frank C. Beardsley, B. C. E., 1883. Charles Urban Boley, B. C. E., 1883.
George W. Brown, B. C. E., 1886. Archibald O. Powell, B. C. E., 1880.
(*On Examination.*)
Erick Theodore Erickson, B. C. E., 1889.
Thesis: "Comparative Tests of Hydraulic Cements."

SPECIAL DEGREE IN COURSE.

BACHELOR OF PHILOSOPHY.

Elizabeth Robson, Normal Course, 1867. Degree to date from 1868.

HONORS IN SPECIAL STUDIES.

Andrew Alexander Bruce — In Civics.
William B. Cairns — In English Literature.
William Francis Robinson — In Natural History.

GRADUATES.

Number of University Graduates, 1854–1890,		1,790
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UNIVERSITY STUDENTS.

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William B. Cairns, B. A., - - - - 635 State Street.
Fellow in English Literature, Room 2, University Hall.

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Fellow in Agriculture, Agricultural Hall.

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Fellow in History, Room 16, University Hall.

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Fellow in Elocution, Room 8, University Hall.

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Fellow in Astronomy, Room 16, University Hall.

Rodney Howard True, B. S., - - - - 635 State Street.
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* (Students *in absentia.*)

Alice Crawford Baily, B. S., - - - Des Moines, Iowa.
Master of Science, in English Literature.

William Henry Baily, Ph, B., - - - Des Moines, Iowa.
Master of Science, in English Literature.

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Master of Arts, in Political Economy and History.

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Master of Arts, in Greek.

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Mechanical Engineer.

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Master of Letters, in English Literature.

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Master of Arts, in French.

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Master of Letters, in English Literature.

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Master of Letters, in Latin.

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Master of Science, in Psychology.

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Richard Keller, B. S., - - - - - - Sauk City.
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Master of Letters, in English Literature.

Hattibel Merrill, B. S., - - - - - - Milwaukee.
Master of Science, in Zoology.

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Master of Letters, in History of Spanish American Institutions.

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Master of Arts, in Philosophy.

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Master of Science, in Botany.

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Master of Letters, in English History.

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Master of Arts, in History.

Mary M. Howe Shelton, B. S., - - - - - Rhinelander.
Master of Letters (English), in English History.

Eugene A. Steere, B. S., - - - - - Butte, Montana.
Master of Science, in Geology.

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Master of Arts, in Greek.

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Master of Letters, in History.

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B. L. (Eng.), University of Wisconsin — Italian.

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Ph. D., B. E., Yale University — General History.

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B. L., University of Wisconsin — Italian.

George Clark Jones, Jr., - - 341 W. Washington Avenue.
B. S., Appleton University — Assaying and Chemistry.

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B. S., Michigan Agricultural College — Agriculture.

Gertrude B. McGill, - - - - 222 S. Hamilton Street.
A. B., Swarthmore College — History.

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Flora Carlena Moseley, - - - - 120 Langdon Street.
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Bertha Staples Pitman, - - - 135 W. Gorham Street.
B. L., University of Wisconsin — Italian.

George Brakerhoff Ransom, - - - 710 Langdon Street.
P. E. U. S. Naval Academy — Civil Engineering.

Michael Lawrence Reynolds, - - 152 E. Johnson Street.
B. C. E., Notre Dame University — Electricity.

Frances Barnett Sheldon, - - - 135 W. Gorham Street.
A. B., Oberlin College, O. — Italian.

Helen A. Steensland, - - - - - - Maple Bluff.
B. L. (Eng.), University of Wisconsin — Pedagogy.

Frank Stanley Traverse, - - - - 1029 University Avenue.
B. S., University of Wisconsin — Geology and Chemistry.

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Clyde Campbell,	Hudson,	714 State Street.
August Frederick Fehlandt,	Marxville,	408 W. Washington Ave.
John Sidney Hotton,	Spring Prairie,	619 Francis Street.
Samuel David Huntington,	Green Bay,	332 State Street.
Marion Thomasine Janeck,	Madison,	107 N. Webster Street.
Theodore Kronshage,	Boscobel,	635 State Street.
Charles Smith Miller,	Oconomowoc,	724 E. Gorham Street.
Frank Hayden Miller,	Fulton,	627 University Avenue.
George Edwin Morton,	Omro,	404 N. Henry Street.
Ellie May Sanborn,	Argyle,	Ladies' Hall.
Elsbeth Veerhusen,	Madison,	605 E. Gorham Street.

—12.

MODERN CLASSICAL COURSE.

Tillie H. Bacon,	Baraboo,	712 Langdon Street.
Olive Baker,	Madison,	1410 Williamson Street.
Laura Barber,	Watertown,	712 Langdon Street.
Jean Hayes Cady,	Kilbourn,	146 Langdon Street.
Warren Arthur Dennis,	Sharon,	614 Langdon Street.
Charles Austin Dickson,	Madison,	Hotel Ogden.
Francis William Dockery,	Madison,	620 State Street.
Jacob Fliegler, Jr.,	Manitowoc,	404 N. Henry Street.
John Joseph Gleason,	Waukesha,	625 Francis Street.
Clarence Foster Hardy,	Genesee,	436 Lake Street.
Herbert Alexander Heyn,	Milwaukee,	206 N. Pinckney Street.
Grace Alma Lamb,	Madison,	202 N. Carroll Street.
Laura Louise Miller,	Sparta,	1109 University Avenue.
George Wilton Moorehouse,	Wauwatosa,	512 Lake Street.
Arthur Frederick Oakey,	Madison,	1310 University Avenue.
Nell Millan Perkins,	Sioux City, Ia.,	640 State Street.
Blanche H. Powers,	Baraboo,	712 Langdon Street.
Emma Bertha Rosenstengel,	Madison,	640 Francis Street.
Winifred Sercombe,	Milwaukee,	630 Langdon Street.
Cassandra Updegraff,	Decorah, Ia.,	Ladies' Hall.
Thomas Klingenberg Urdahl,	Madison,	1037 Spaight Street.
Helen West,	Milwaukee,	712 Langdon Street.

—22.

ENGLISH COURSE.

George G. Armstrong,	Boscobel,	210 Langdon Street.
William Monroe Balch,	Madison,	626 Langdon Street.
Jacob Michael Bold,	Bloomingdale,	1213 W. Johnson Street.
Eleanor Breese,	Portage,	712 Langdon Street.
Mabel Bushnell,	Lancaster,	Ladies' Hall.
Lucy May Churchill,	Waupaca,	640 State Street.
Julius Theodore Dithmar,	Reedsburg,	519 Lake Street.
William Francis Dockery,	Madison,	620 State Street.
Daniel Justin Donahoe,	Columbus,	627 University Avenue.
Loyal Durand,	Madison,	227 Langdon Street.
James Frawley,	Eau Claire,	420 Murray Street.
George Edwin Frost,	Almond,	531 State Street.
Ella Sargeant Gernon,	Madison,	116 W. Gorham Street.
Alice Goldenberger,	Madison,	801 University Avenue.
Mildred Lewis Harper,	Madison,	311 W. Main Street.
Morse Ives,	Madison,	411 Lake Street.
Frank Hanchett Jackman,	Janesville,	620 State Street.
Grace Elizabeth Johnson,	Madison,	525 Langdon Street.
Robert Marquard Lamp,	Madison,	750 E. Johnson Street.
Elinor May Leith,	Madison,	129 E. Gorham Street.
Isabel Chester Loomis,	Portage,	712 Langdon Street.
Agnes Lowe,	Westfield,	Ladies' Hall.
Edward Stillman Main,	Madison,	518 Wisconsin Avenue.
Arthur Mayne McCoy,	Evansville,	709 University Avenue.
Edgar John Patterson,	Madison,	314 Langdon Street.
Thomas Henry Ryan,	S. Kaukauna,	427 Murray Street.
Albert Hart Sanford,	Platteville,	610 Langdon Street.
William Smieding,	Racine,	414 Lake Street,
Edward Kirby Thomas,	Dodgeville,	427 Murray Street.
Leverett Case Wheeler,	Madison,	406 Murray Street.
William Frederick Wolfe,	Greenville,	23 W. Doty Street. —31

GENERAL SCIENCE COURSE.

Frederick William Adamson,	Madison,	512 Lake Street.
Lellen Sterling Cheney,	Madison,	519 Lake Street.
Joseph Freehoff,	Sigel,	1124 W. Johnson Street.
Harry Hawthorn Herzog,	Racine,	707 State Street.
Frederick Thomas Kelly,	Mineral Point,	201 Wisconsin Avenue.
Truman Elbert Loope, Jr.. .	Eureka,	314 Langdon Street.
Fred Walter McNair,	Madison,	514 Lake Street.
Edward H. Ochsner,	Baraboo,	817 W. Johnson Street.

Maybelle Maud Park,	Madison,	813 State Street.	
Albert Wesley Park,	Madison,	813 State Street.	
Charles Ringham Pickering,	Basswood,	519 Lake Street.	
Walter DeWitt Shelden,	Reedsburg,	213 W. Gilman Street.	
Whiting Day Stanley,	Baraboo,	213 W. Gilman Street.	
Bertha Van Dusen,	Portage,	640 State Street.	
Floy Van Dusen,	Portage,	640 State Street.	—15

CIVIL ENGINEERING COURSE.

Andrews Allen,	Madison,	228 Langdon Street.	
Henry Bird,	Union Grove,	432 Lake Street.	
Edward I. Philleo,	Grand Rapids,	404 W. Mifflin Street.	
Harold Frederick Phillips,	Madison,	433 W. Wilson Street.	
Fred Henry Smith,	Wauwatosa,	432 Lake Street.	
Harry Anthony Smith,	Freeport, Ill.,	601 State Street.	—6

MECHANICAL ENGINEERING COURSE.

William Francis Funk,	La Crosse,	403 W. Mifflin Street.	
Harry Julius Hirshheimer,	La Crosse,	403 W. Mifflin Street.	
Oscar Briggs James,	Ric'l'nd Center,	414 W. Gorham Street.	
Carl Albert Johnson,	Madison,	316 Wisconsin Avenue.	
Emery Halbert Powell,	Lake Geneva,	311 Park Street.	
Fred William Prael,	Madison,	512 Lake Street.	
George Gowen Thorp,	Madison,	427 N. Butler Street.	—7

RAILWAY ENGINEERING COURSE.

Fred Harmon Benson,	Milwaukee,	316 Mills Street.	
Samuel Benjamin Durand,	Madison,	227 Langdon Street.	
James A. McKim,	Sterling, Ill.,	620 Langdon Street.	—3

SPECIAL STUDENTS.

William Frank Ellsworth,	Madison,	221 Langdon Street.	
Marion Belle Wheeler,	Madison,	406 Murray Street.	—2
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JUNIOR CLASS.

ANCIENT CLASSICAL COURSE.

Edward Wells Brown,	Milwaukee,	604 Francis Street.
Walter Thomas Campbell,	River Falls,	454 W. Gilman Street.
Henry Warren Freeman.	Chicago, Ill.	614 Langdon Street.
Elbert Budd Hand.	Racine,	604 Francis Street.
Charles Henry Maxson.	Madison,	813 State Street.
John Albert Musser,	Monroe,	610 Langdon Street.
Paul Samuel Reinsch,	Milwaukee,	425 Francis Street.
John Jacob Schlicher,	Merton,	431 Francis Street.
Helen Greig Thorp,	Madison,	427 N. Butler Street. —9

MODERN CLASSICAL COURSE.

Henry Augustus Adrian,	Monticello,	610 Langdon Street.
Julia Annie Armstrong,	Portage,	Ladies' Hall.
George Thomas Atwood,	Madison,	1106 W. Johnson Street.
Walter Dexter Brown,	Stevens Point,	316 State Street.
Esther Fretwell Butt,	Viroqua,	Ladies' Hall.
Junius Thomas Hooper,	Darlington,	425 Francis Street.
Jennie Anna Huenkemeier,	Freeport, Ill.,	Ladies' Hall.
Edith Hattie Locke,	Madison,	15 E. Wilson Street.
John Mandt Nelson,	Token Creek,	10 S. Canal Street.
James Francis Augustine Pyre,	Fulton,	614 Langdon Street.
Hubert Edward Rogers,	Wauwatosa,	223 W. Gilman Street.
Albert Lea Sawyer,	Columbus,	626 Langdon Street
Adaline White,	Madison,	626 Langdon Street. —13.

ENGLISH COURSE.

Lida H. Connor,	Monroe,	314 W. Washington Ave.
Jeremiah John Cunningham,	Dayton,	416 Murray Street.
Helen Daniels,	Sharon,	524 Francis Street.
Mae Evans,	Platteville,	Ladies' Hall.
William Lincoln Evans,	Waupaca,	438 Lake Street.
John Cassidy Healy,	Beaver Dam,	416 Murray Street.
Frederick Arthur Jefferson,	Madison,	121 N. Webster Street.
Marion Louise Johnson,	Waterloo, Iowa,	Ladies' Hall.
George Walker Lane,	Dodgeville,	432 W. Gorham Street.
George Henry Landgraf,	Ft. Atkinson,	Washburn Observatory.
Orin Grant Libby,	New Richmond,	205 Lake Street.
Edward Parker McFetridge,	Baraboo,	404 N. Henry Street.

Anton Johnson Moe,	Three Lakes,	427 Murray Street.
Annie Pellow,	Linden,	314 W. Washington Ave.
Edna Bertha Richardson,	Brodhead,	630 Langdon Street.
Elmo Wilson Sawyer,	Hartford,	433 Francis Street.
Edward Paddock Sherry,	Neenah,	620 State Street.
Margaret Smith,	Watertown,	Ladies' Hall.
Anna Ellen Spencer,	Milwaukee,	640 State Street.
Carrie Belle Stevens,	Sharon,	524 Francis Street.
James Huntington Turner,	Berlin,	613 Francis Street.
William Wesley Young,	Monroe,	613 Francis Street. —22.

GENERAL SCIENCE COURSE.

Frank Hart Bartlett,	Eau Claire,	604 Francis Street.
Edward Monroe Beeman,	Augusta,	425 Francis Street.
Charles Jason Fenner,	Madison,	1112 W. Johnson Street.
Herbert Rollin Hammond,	Durand,	714 State Street.
Louis Kahlenberg,	Two Rivers,	514 Lake Street.
Samuel S. Lamont,	Madison,	1151 E. Johnson Street.
Grace Emma Lee,	Madison,	209 E. Mifflin Street.
Ruth Marshall,	Kilbourn City,	Ladies' Hall.
Lester C. Mayhew,	Milwaukee,	604 Francis Street.
J. Elmer NeCollins,	Hazel Green,	124 W. Gilman Street.
Samuel Arthur Piper,	Madison,	Madison, P. O. Box 1234.
Theodore Running,	Viroqua,	501 University Avenue.
Willard T. Saucerman,	Monroe,	813 State Street.
Homer Sylvester,	Mineral Point,	210 Langdon Street.
Wesley Munger Thomas,	Dodges' Corners,	813 State Street.
Charles Stephen Tilden,	Elm Grove,	925 University Avenue. —16.

CIVIL ENGINEERING COURSE.

Edwin Hugh Ahara,	Evansville,	Washburn Observatory.
Adelbert Archer Babcock,	Appleton,	420 Lake Street.
James Henry Brace,	Dixon,	422 N. Henry Street.
Harvey Freeman Hamilton,	Sun Prairie,	702 State Street.
John Hawley McNaught,	Madison,	410 N. Carroll Street.
Olin Andrew Mead,	Appleton,	523 Lake Street.
Frank Elbert Morrow,	Spring Green,	205 Lake Street.
Beverly Lyon Worden.	Milwaukee,	712 State Street. —8.

MECHANICAL ENGINEERING COURSE.

Robert Lyman Beck,	Platteville,	511 Francis Street.
Charles Wilbur Bennett,	Albany,	422 N. Henry Street.
Henry Fox,	Baraboo,	433 Murray Street.

Hendrick Bismarck Gregg,	Madison,	925 University Avenue.
Rudolph J. Logemann,	Milwaukee,	446 W. Gilman Street.
Herman John Minch,	Madison,	222 W. Gorham Street.
George Charles Henry Mors,	Appleton,	314 Mills Street.
Loren Locke Prescott,	Marinette,	620 State Street.
Calvin Zenas Wise,	Madison,	728 W. Johnson Street.
Euclid Pascal Worden,	Milwaukee,	620 State Street. —10.

MINING ENGINEERING COURSE.

George Hiram Stanchfield,	Fond du Lac,	511 Francis Street. —1.

ELECTRICAL ENGINEERING COURSE.

Edwin Thomas Munger,	Madison,	515 N. Carroll Street. —1.

AGRICULTURAL COURSE.

James W. Hutchinson,	Randolph,	204 Murray Street.
Carl Hall Potter,	Madison,	412 Mary Street.
Albert Monroe Ten Eyck,	Brodhead,	207 Murray Street. —3.

SPECIAL STUDENTS.

Marilla Andrews,	Evansville,	1001 University Avenue.
Laura Baxter,	Lancaster,	630 Langdon Street.
Thomas Percy Carter,	Platteville,	620 State Street.
Chandler Burnell Chapman,	Madison,	212 Langdon Street.
Sophie Clawson,	Monroe,	Ladies' Hall.
Edward McBeth Dexter,	Milwaukee,	210 Langdon Street.
Albert Clarence Finn,	Patch Grove,	435 Park Street.
Linnie May Flesh,	Piqua, O.,	Ladies' Hall.
Louis Bertram Flower,	Chicago, Ill.,	620 State Street.
René Ernest Hilbert,	Milwaukee,	613 Francis Street.
William Henry Hopkins,	Leeds,	931 W. Johnson Street.
George Albert Kinsman,	Fremont,	1109 Uuiversity Avenue.
Robert Manley Long,	Sun Prairie,	220 N. Broom.
Frank Jackson McNett,	Milwaukee,	424 Francis Street.
Bird Morrison,	Madison,	133 E. Gilman Street.
Sara Anderson Potter,	Madison,	412 Mary Street.
Ottilie Marie Schuman,	Portage,	Ladies' Hall.
Georgia R. Sheldon,	Madison,	150 Langdon Street.
Austin Andrew Skolas,	Door Creek,	627 University Avenue.
Florence Augusta Stearns,	Madison,	512 Wisconsin Avenue.
Henry Freeman Stecker,	Rice Lake,	201 Wisconsin Avenue.
Charles McGee Williams,	Whitewater,	614 Langdon Street.
Henry Elmer Willsie,	La Crosse,	635 State Street. —23.

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SOPHOMORE CLASS.

ANCIENT CLASSICAL COURSE.

Fred Morris Jackson,	Monroe,	311 Brooks Street.
Amanda Marie Johnson,	Rockdale,	422 N. Henry Street.
Charles Coolidge Parlin,	Brodhead,	311 Brooks Street.
George Wilson Mead,	Rockford, Ill.,	1124 W. Johnson Street.
Mary Pauline Richardson,	Milwaukee,	Ladies' Hall.
Henry Tillinghast Sheldon,	Madison,	150 Langdon Street.
Herbert Scott Siggleko,	Madison,	311 Brooks Street.
Mary Elizabeth Smith,	Madison,	1308 E. Dayton Street.

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MODERN CLASSICAL COURSE.

Martha Sumner Baker,	Madison,	16 Langdon Street.
Frances McConnell Bowen,	Madison,	15 N. Henry Street.
Mary Catherine Brown,	Madison,	1144 E. Johnson Street.
Daisy Jewell Chadwick,	Monroe,	630 Langdon Street.
Elizabeth May Donoughue,	Madison,	424 W. Gorham Street.
Robert Baldwin Dunlevy,	Sparta,	535 State Street.
Laura Maud Fuller,	Janesville,	Ladies' Hall.
Bessie Euphemia J. Haggerty,	Mt. Sterling,	Ladies' Hall.
Robert Lathrop,	Rockford, Ill.,	620 Langdon Street.
Margaretta Bradley Lewis,	Sparta,	209 E. Mifflin Street.
Helen Louise Mayer,	Madison,	615 E. Gorham Street.
Mary Isabel Murray,	Madison,	713 State Street.
Gertrude Belle Nutting,	Sparta,	209 E. Mifflin Street.
Anna Irene Oakey,	Madison,	1310 University Avenue.
John Cameron Thompson,	Princeton,	University Hotel.
Florence Virginia Williams,	Viroqua,	Ladies' Hall.
George Edward Williams,	Columbus,	425 Francis Street.

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ENGLISH COURSE.

Joseph Zoel Arpin,	Grand Rapids,	619 Francis Street.
Theodore Benfey,	Sheboygan,	626 Langdon Street.
Henry Lawrence Blaisdell,	Rockford, Ill.,	420 Lake Street.
Samuel Albert Bostwick,	Eau Claire,	810 University Avenue.
Harvey Clark,	Brodhead,	416 W. Washington Ave.
John Francis Doherty,	North Freedom,	1205 W. Johnson Street.
Malcolm Campbell Douglas,	Monroe,	635 State Street.
Charles Herrick Doyon,	Madison,	752 E. Gorham Street.
Herman Erb, Jr.,	Appleton,	23 W. Doty Street.

Frederick Roche Estes,	Madison,	712 State Street.
Louis Henry Fales,	Madison,	1109 University Avenue.
John Adams Fillmore,	Milwaukee,	414 Lake Street.
Edward Joseph Frawley,	Eau Claire,	420 Murray Street.
James Francis Griffin,	East Troy,	501 University Avenue.
Edward Lawyer Hardy,	La Crosse,	614 Langdon Street.
Sabena Herfurth,	Madison,	703 E. Gorham Street.
Frank Katzenstein,	Milwaukee,	424 Murray Street.
Luella Belle Knapp,	Madison,	408 W. Washington Ave.
George Kroencke, Jr.,	Wilmot,	213 Park Street.
Joseph Thomas Lindley,	Fox Lake,	204 Murray Street.
Jennie Augusta Maxon,	Walworth,	725 University Avenue.
William Chester McCard,	Madison,	216 Langdon Street.
Marie Josephine Merk,	Sauk City,	813 State Street.
Carlotte May Millard,	Lake Mills,	217 W. Gilman Street.
Julia Ellen Murphy,	Madison,	215 Murray Street.
Louis Wescott Myers,	Lake Mills,	210 Langdon Street.
Mary Hough Oakley,	Madison,	Ladies' Hall.
Carrie Owen,	Milwaukee,	Ladies' Hall.
Byron Dixon Paine,	Madison,	113 E. Gorham Street.
Barton Lessey Parker,	DePere,	535 State Street.
George Douglas Pease,	Eau Claire,	810 University Avenue.
Frank Xavier Pomainville,	Grand Rapids,	13 N. Broom Street.
Charles Britton Rogers,	Ft. Atkinson,	208 Monona Avenue.
Claud Milligan Rosecrantz,	Sparta,	420 Lake Street.
Clara Stella Schuster,	Madison,	314 Mills Street.
Louis Dunning Sumner,	Madison,	1 E. Wilson Street.
William Earle Swain,	Madison,	P. O. Box 1263.
Grace Larkin Terry,	Madison,	P. O. Box 1095.
Ellen Breese Turner,	Portage,	712 Langdon Street.
Elmer Charles Waddington,	Argyle,	341 W. Mifflin Street.
James Alexander Walsh,	Centralia,	501 University Avenue.
William Edward Wheelan,	Grand Rapids,	13 N. Broom Street.
Platt J. Whitman,	Dodgeville,	427 Murray Street.
Lawrence Clark Whittet,	Edgerton,	635 State Street.
Louise Lee Wilder,	Evansville,	Ladies Hall. —45

GENERAL SCIENCE COURSE.

Clement Abner Boughton,	Baraboo,	422 N. Henry Street.
Charles Chester Case,	Prairie du Chi'n	614 Langdon Street.
Wilfred Earl Chase,	Madison,	Madison P. O.
Orestes Alonzo Crowell,	Almond,	531 State Street.
Anna Ellsworth,	Oregon,	1213 W. Johnson Street.

Paul Allen Fox,	Stoughton,	436 Lake Street.
Guy LeRoy Hunner,	Eau Claire	613 Francis Street.
Walter Edward Kaser,	Sparta,	610 Langdon Street.
Fred Sherman Miller,	Fulton,	609 State Street.
Albert John Reed,	Palmyra,	1122 W. Johnson Street.
Harriet Smith,	Janesville,	640 State Street.
Frederick Charles Thwaits,	Milwaukee,	709 University Avenue —12

CIVIL ENGINEERING COURSE.

Horace Prentiss Boardman,	Parsons, Kans.,	635 State Street.
Frederick Filer Fowle,	Oak Creek,	816 University Avenue.
James Hain,	Edgerton,	1106 W. Johnson Street.
Patrick Festus Joyce,	DePere,	304 W. Main Street.
Eugene Roderick MacDonald,	Madison,	Wingra Park.
Charles Thuringer,	Madison,	315 N. Pinckney Street.
Gustav Otto Viebahn,	Watertown,	435 Park Street.
James Glenn Wray,	Janesville,	1109 University Avenue.
Archer Romeo Ziemer,	Madison,	303 Park Street. —9

MECHANICAL ENGINEERING COURSE.

William Corwin Burton,	Milwaukee,	709 University Avenue.
William L. Erbach,	Milwaukee,	207 W. Gilman Street.
George Edward Gernon,	Madison,	116 W. Gorham Street.
Harold Llewellyn Griffith,	Elkader, Iowa,	419 Lake Street.
Gerdt Adolph Gerdtzen,	Winona, Minn.,	446 W. Gilman Street.
Henry Ackley Lardner,	Oconomowoc,	210 Langdon Street.
Francis Thomas McDonough,	Eau Claire,	603 Francis Street.
Oscar Frank Minch,	Madison,	328 State Street.
George Howard Paul, Jr.,	Milwaukee,	412 Murray Street.
John Franklin Sweet,	Milwaukee,	613 Francis Street.
Thomas Staines Swope,	Louisville, Ky.,	620 State Street.
Leonard Lafayette Tessier,	DePere,	535 State Street.
Giles McClure Turner,	Stoughton,	436 Lake Street. —13

ELECTRICAL ENGINEERING COURSE.

Harry Bartlett Alverson,	Portage,	422 N. Henry Street.
Frederick Howe Ford,	Waupun,	611 Francis Street.
Robert Henry Hackney,	Milwaukee,	412 Murray Street.
Alson Isaac Smith,	Pewaukee,	217 W. Gilman Street. —4

AGRICULTURAL COURSE.

Wilber F. Stiles,	Lake Mills,	931 W. Johnson Street. —1

SPECIAL STUDENTS.

Frank Harvey Allen,	Richland Cen't,	414 W. Gorham Street.
Harry Cresswell Altizer,	Lancaster,	611 W. Dayton Street.
Carletta Cathrine Anderson,	Madison,	316 N. Carroll Street.
Henry M. Ashton,	Arcadia,	611 W. Dayton Street.
Spencer DeWitt Beebe,	Sparta,	535 State Street.
Charles Elliot Birge,	Whitewater,	313 Charter Street.
John Jeremiah Blake,	Mazomanie,	314 Mills Street.
Irwin Willard Blake, Jr.,	Viroqua,	1103 Johnson Street.
Harry Bingham Boardman,	Milwaukee,	614 Langdon Street.
Oscar Franklin Boerner,	Cedarburg,	635 State Street.
Emma Almeda Buckmaster,	Fayette,	519 Lake Street.
Arthur Fletcher Bulfinch,	Juda,	436 W. Gorham Street.
Mary Alice Bulfinch,	Juda,	221 N. Pinckney Street.
Frances Bunn,	Madison,	104 Langdon Street.
Howard Erastus Burton,	Lake Geneva,	613 Francis Street.
Warren Edgar Burton,	Lake Geneva,	613 Francis Street.
William Edward Butt,	Viroqua,	620 Langdon Street,
Bertha M. Cassoday,	Madison,	139 E. Gilman Street,
Martha C. Cooley,	Mount Hope,	311 Brooks Street.
Mary M. Cooley,	Mount Hope,	311 Brooks Street.
Ella Davis,	Madison,	404 N. Carroll Street.
John Francis Donovan,	Madison,	430 Clymer Street.
Peter Martin Ellingsen,	Rockdale,	419 Lake Street.
Burton Haines Esterly,	Whitewater,	614 Langdon Street.
Joseph William Fitch,	Madison,	415 Wisconsin Avenue.
George Tobias Flom,	Utica,	627 University Avenue.
Mary Gray,	Scofield,	Ladies' Hall.
John Howell Griffith,	Syracuse, N. Y.,	132 Murray Street.
Walter George Grimmer,	Kewaunee,	206 State Street.
John Patrick Gunn,	Eau Claire,	716 State Street.
George Wilber Hadley,	Madison,	719 State Street.
Ansel Vickery Hammond,	Durand,	431 Francis Street.
Herbert Jean Harris,	Waupun,	816 University Avenue.
Herbert Michael Haskell,	Ft. Atkinson,	1124 W. Johnson Street.
Josephine Hatch,	Big Spring,	931 W. Johnson Street.
Anna Gibbon Heritage,	Edgerton,	217 E. Gilman Street.
Charles Adrian Ingram,	Durand,	527 State Street.
Christian N. Johnson,	Sumner.	627 University Avenue.
George Henry Katz,	Milwaukee,	709 University Avenue.
Albert Nicolaus Kittelsen,	Utica,	419 Lake Street.
Herbert Norman Laflin,	Milwaukee,	614 Langdon Street.

Jay Lytle,	Madison,	431 Francis Street.
Mary Hamilton Main,	Madison,	518 Wisconsin Avenue.
Susie Main,	Madison.	511 N. Carroll Street.
Clark Stewart McCoy,	Sparta,	241 W. Gilman Street.
Joseph Ernst Messersmith,	Madison,	311 Broom Street.
John Alvin Minckler,	Westfield,	419 Lake Street.
John Hiles Moss,	Milwaukee,	620 State Street.
Hubert Esterly Page,	Whitewater,	614 Langdon Street.
Edgar Alfred Pettingill,	Oshkosh,	521 State Street.
Herbert J. Piper,	Palmyra,	1122 W. Johnson Street.
Genevieve Pugh,	Mazomanie,	630 Langdon.
Herbert Edward Quigley,	Lake Geneva,	311 Park Street.
Hattie Jane Richardson,	Sparta,	Ladies' Hall.
Bessie Riddle,	Ada, O.,	Ladies' Hall.
Joseph Frederick Schreiner,	Ft. Atkinson,	Washburn Observatory.
Frederick Frank Showers,	Mazomanie,	408 W. Washington Ave..
Willis Virgil Silverthorn,	Wausau,	436 Lake Street.
Alice Mary Smith,	Wauwatosa,	406 Murray Street.
Alonzo Roswell Smith,	Sparta,	816 University Avenue.
Nissen Peter Stenhjem,	Stoughton,	714 State Street.
Edmond Ray Stevens,	Janesville,	1109 University Avenue.
Benjamin Thomas,	West Salem,	523 N. Carroll Street.
Melvin Tidyman,	Waupun,	150 W. Johnson Street.
Fred. Ferd. Ventzke,	Portage,	1124 W. Johnson Street.
Ernest Farwell Ward,	Black Earth,	414 Lake Street.
John Arthur Week,	Stevens Point,	716 State Street.
Mortimer R. Wiener,	Buffalo, N. Y.,	716 State Street.
Florence Virginia Williams,	Viroqua,	Ladies' Hall.
Sarah Grace Williams,	Poynette,	Ladies' Hall. —70.

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FRESHMAN CLASS.

ANCIENT CLASSICAL COURSE.

William Ware Allen,	Madison,	228 Langdon Street.
Della I. Billig,	Forreston, Iowa,	Ladies' Hall.
Charles M. Davison,	Waupun,	501 University Avenue.
Arthur Howard Gollmar,	Baraboo,	635 State Street.
Otis Evan Hammer,	La Crosse,	311 Brooks Street.
Charles Francis Hawley,	Milwaukee,	512 Lake Street.
Sherman Mereness,	Sharon,	809 W. Johnson Street.

Elwyn F. Nelson,	Oshkosh,	614 Langdon Street.
Fred William Peterson,	Bonduel,	316 Mills Street.
Jennie Pitman,	Madison,	135 W. Gorham Street.
Jesse E. Searles,	Boscobel,	210 Langdon Street.
Calvert Fred Spensley,	Mineral Point,	412 Murray Street.
Charles Horner Tenney,	Madison,	204 N. Few Street.
David D. Thornton,	Joliet, Ill.,	613 Francis Street.
Henry Vilas,	Madison,	12 E. Gilman Street.
William Joseph Whitney,	Madison,	1112 W. Johnson Street.
Arthur Cleaver Wilkinson,	Madison,	15 N. Butler Street. —17.

MODERN CLASSICAL COURSE.

Roy Henry Beebe,	Racine,	607 Francis Street.
Herman John Bierhart,	Racine,	716 State Street.
Bertha Bleedorn,	Janesville,	514 Lake Street.
Catherine May Clawson,	Monroe,	Ladies' Hall.
Laurence Albert Curtis,	Madison,	534 State Street.
Edna Lourene Derthick,	Elkhorn,	Ladies' Hall.
Adele Maria Graves,	Milwaukee,	406 Murray Street.
Jessie Griffith,	Fond du Lac,	Ladies' Hall.
Theodore Herfurth,	Madison,	703 E. Gorham Street.
Grace Louise Hopkins,	Madison,	134 W. Wilson Street.
Jessie Mary Howland,	Eau Claire,	Ladies' Hall.
Irma Meta Kleinpell,	Madison,	208 Monona Avenue.
Carl Gustavus Lawrence,	Madison,	513 Baldwin Street.
Guy Erwood La Follette,	Chamberlin, So. D.,	409 W. Wilson Street.
Lucy Kate McGlachlin,	Stevens Point,	Ladies' Hall.
Mary McKitrick,	Viroqua,	Ladies' Hall.
Helen Kate McMynn,	Madison,	604 State Street.
Susan Bridget Moore,	Hudson,	428 Lake Street.
Thomas Paine Nelson,	Madison,	22 N. Webster Street.
Susie Pierce Regan,	Madison,	321 S. Hamilton Street.
Patrick Rowan,	Beaver Dam,	217 Mills Street.
Mary Ada Walker,	Stevens Point,	Ladies' Hall.
Charles Henry Williams,	Columbus,	913 University Avenue.
Anna Imogene Wyman,	Eau Claire,	712 Langdon Street.
Caroline Morris Young,	Madison,	28 W. Wilson Street. —25.

ENGLISH COURSE.

Charles Lehman Aarons,	Milwaukee,	316 Mills Street.
Belle Abbott,	Beloit,	315 Brooks Street.
Charles Leander Baldwin,	Kendall,	425 Francis Street.
Flora Anna Barnes,	Pr. du Chien,	Ladies' Hall.

Frank F. Bowman,	Madison,	29 E. Wilson Street.
Mary S. Buckmaster,	Fayette,	519 Lake Street.
Winnifred May Case,	North Greenfield,	406 Murray Street.
Simon Francis Casey,	Pine Bluff,	301 Murray Street.
Chester Dwight Cleveland, Jr.,	Oshkosh,	422 N. Henry Street.
Mamie Ruth Collins,	Pra. du Chien,	1001 University Avenue.
Julie Isabel De Vore,	Freeport, Ill.,	Ladies' Hall.
Robert Ninian Dow,	Cambridge,	Dow's Mills.
Katherine May Falvey,	Baraboo,	1124 W. Johnson Street.
Marcus Clizbee Ford,	Madison,	1033 Spaight Street.
Martha Elizabeth Foren,	Madison,	454 W. Main Street.
May Stuart Foster,	Madison,	406 N. Pinckney Street.
William R. Graves,	Boscobel,	215 Murray Street.
Stanley C. Hanks,	Madison,	216 Langdon Street.
Mary Estelle Hayden,	Sun Prairie.	115 Johnson Street.
Edward Julius Henning,	Iron Ridge,	810 University Avenue.
Gilbert T. Hodges, Jr.,	Monroe,	601 State Street.
E. Wheeler Howland,	Fort Howard,	714 State Street.
Miriam Hoyt,	Wauwatosa,	406 Murray Street.
Sarah M. Johnson,	Milwaukee,	422 N. Henry Street.
Ina Judge,	Darlington,	640 State Street.
Knox Kinney,	Aurora, Ill.,	620 State Street.
Court W. Lamoreaux,	Mayville,	810 University Avenue.
Dena Lindley,	Madison,	231 W. Gilman Street.
Marie Lyford,	Roscoe, Ill.,	Ladies' Hall.
James Daniel Madison,	Mazomanie,	301 Murray Street.
Marshall C. Moss,	Milwaukee,	601 State Street.
David Francis O'Keefe,	Stevens Point,	344 W. Dayton Street.
Ada M. Parsons,	Milwaukee,	Ladies' Hall.
John Alexander Pratt,	Stoughton,	117 S. Butler Street.
Robert E. Rienow,	Pra. du Chien,	614 Langdon Street.
Ward Beecher Short,	Dodgeville,	425 Francis Street.
Etta Milton Smith,	Mineral Point,	640 State Street.
Mary E. Spencer,	Waupaca,	625 Langdon Street.
William A. Sprague,	Monroe,	601 State Street.
William Henry Steele,	Pewaukee,	422 Gilman Street.
Alvin W. Strong,	Fort Atkinson,	719 State Street.
Helen Chamberlin Tarbox,	Necedah,	Ladies' Hall.
Gordon Haines True,	Baraboo,	635 State Street.
Mary E. Waldo,	Manitowoc,	640 State Street.
Frank Antes Wheelihan,	Necedah,	511 Francis Street.

—45.

GENERAL SCIENCE COURSE.

John Marshall Beffel,	Racine,	713 State Street.
Francis James Bold,	Madison,	925 W. Johnson Street.
Regina Rosetta Bold,	Bloomingdale,	1213 W. Johnson Street.
Sadie May Bold,	Viroqua,	925 W. Johnson Street.
S. Webb Campbell,	Hudson,	627 University Avenue.
Edward Perkins Carlton,	Wauwatosa,	311 Park Street.
Frank Hurd Crane,	Beaver Dam,	425 Francis Street.
Percy Spencer Elwell,	La Crosse,	620 Langdon Street.
Ernest Levi Hicks,	Oshkosh,	429 Park Street.
Louis Tyler Hill,	Sparta,	210 Langdon Street.
Alexander George Hough,	Racine,	638 Langdon Street.
Otto Fred Jonas,	Racine,	1124 W. Johnson Street.
Sarah Louise Kingsley,	Madison,	518 State Street.
Gertrude Light,	Milwaukee,	428 Lake Street.
George Malcolm McGregor,	Eau Claire,	343 Washington Avenue.
Nettie Leah McMichael,	Viroqua,	Ladies' Hall.
Edward Frank Shultz,	Reedsburg,	213 W. Gilman Street.
Anna Mary Strong,	Mineral Point,	803 State Street.
Samuel Weidman,	Ableman,	627 University Avenue.
Andrew Robinson Whitson,	Northfield, Minn.,	539 State Street.
Henry Sherwood Youker,	Waterloo,	925 W. Johnson Street.

—21.

CIVIL ENGINEERING COURSE.

Arsin Lewis Arpin,	Grand Rapids,	619 Francis Street.
Otto Austin,	Monroe,	203 Lake Street.
William Alfred Baehr,	Oshkosh,	707 State Street.
Edward Milton Evans,	Racine,	1124 W. Johnson Street.
George B. Evans,	Spring Green,	205 Lake Street.
Harry LaFayette Kellogg,	Madison,	734 E. Gorham Street.
William Christie McNaught,	Madison,	410 N. Carroll Street.
John Joseph Monahan,	East Troy,	425 Francis Street.
Oscar Rohn,	Jackson,	311 Brooks Street.
Heber L. Tibbits,	Wausau,	210 Langdon Street.
Lester Tilton,	Viroqua,	725 W. Johnson Street.
Allen Fish Van Ornum,	Racine,	713 State Street.

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MECHANICAL ENGINEERING COURSE.

Charles Melvin Anderson,	Forward,	522 State Street.
Charles Henry Austin,	East Troy,	420 Francis Street.
Paul Biefeld,	Watertown,	446 W. Gilman Street.
Herbert Scott Blake,	Racine,	540 State Street.

Austin Burt,	Bl'k River Falls,	420 Lake Street.	
Royal Page Davidson,	Highland Park, Ill.,	511 Francis Street.	
Emory Alford Hyatt,	Richl'nd Center,	203 Lake Street.	
Hobart Stanley Johnson,	Madison,	316 Wisconsin Avenue.	
Edward Martineau Kurtz,	Milwaukee,	709 University Avenue.	
Theodore C. Menges,	Prairie du Chien,	626 Langdon Street.	
George Millegen Newton,	Sparta,	209 E. Mifflin Street.	
Rudolph John Ochsner,	Waumandee,	817 W. Johnson Street.	
Bruno Schuster,	Milwaukee,	207 W. Gilman Street.	
Fred E. Soden,	Oregon,	231 W. Gilman Street.	
Bartley Stanchfield,	Fond du Lac,	511 Francis Street.	
Martyn Finch Warner,	Milwaukee,	210 Langdon Street.	
William Leonard Woodward,	Madison,	539 State Street.	—17

ELECTRICAL ENGINEERING COURSE.

Richard Myron Arms,	Randolph,	719 State Street.	
Giles Dow,	Stoughton,	714 State Street.	
George Theodore Elliott,	Milwaukee,	613 Francis Street.	
Oscar Hansen,	Kenosha,	1124 W. Johnson Street.	
Alexander Nast,	Chicago, Ill.,	626 Langdon Street.	
Rudolph R. Rosenstengel,	Madison,	640 Francis Street.	
Sidney Roby Sheldon,	Madison,	507 Langdon Street.	
Fred David Silber,	Milwaukee,	424 Murray Street.	
Frank Arthur Vaughn,	Madison,	337 W. Main Street.	
Dean Richmond Williams,	Milwaukee,	412 Murray Street.	—10

AGRICULTURAL COURSE.

William Balentine Anderson,	Madison,	412 Mary Street.	—1

SPECIAL STUDENTS.

George Krogh Anderson,	Madison,	316 N. Carroll Street.
Otto Anderson,	Chicago, Ill.,	222 W. Gilman Street.
Charles Francis Austin,	Bloomington,	925 University Avenue.
Amelia Martha Babcock,	Necedah,	Ladies' Hall.
Charles Richard Barney,	Mauston,	424 Francis Street.
August Frederick Bartels,	Waverly, Ia.	144 S. Blair Street.
Agnes Stone Bassett,	Columbus,	Ladies' Hall.
Bert F. Bates,	Retreat,	431 Francis Street.
Alice Girdham Beecroft,	Madison,	433 Francis Street.
Marie Hepburn Benton,	Washington, D.C.,	109 W. Washington Av.
Hobart Stanley Bird,	Madison,	810 E. Gorham Street.

Emma Bowman,	Kilbourn City,	Ladies' Hall.
William M. Brennan,	Cato,	344 W. Dayton Street.
Grace Winfield Bross,	Madison,	625 Langdon Street.
Sarah Edith Brown,	Madison,	214 E. Washington Ave.
Kate Dana Bucknam,	Sioux City,	Ladies' Hall.
Edward Walter Bundy,	Menomonee,	830 W. Johnson Street.
Jennie H. Butt,	Viroqua,	Ladies' Hall.
Allan W. Carpenter,	Tomah,	734 Gorham Street.
Laura A. Case,	Pra. du Chien,	Ladies' Hall.
Walter Scott Chambers.	Newcastle, Ind.,	619 Francis Street.
William Henry Chapple,	Ashland,	522 State Street.
Catharine Caroline Cleveland,	Oshkosh,	422 N. Henry Street.
Arthur Elwood Coe,	Madison,	519 Lake Street.
James Francis Cosgrove,	Madison,	420 W. Washington Ave.
Clarence Barker Culbertson,	Augusta,	613 Francis Street.
Albert Foster Dawson,	Preston, Ia.,	124 W. Gilman Street.
Florence Amanda Dennett,	Baraboo,	7 E. Dayton Street.
Edward Frederick Dithmar,	Reedsburg,	519 Lake Street.
Henry Radford Dockery,	Waukesha,	620 State Street.
Pearl E. Doudna,	Gillingham,	315 Brooks Street.
Wess J. Dougan,	Madison,	539 State Street.
Carl Amasa Drake,	Poynette,	538 State Street.
*Fred. Thomas Drake,	Black Earth,	414 Lake Street.
Anthony Guy Dunning,	Madison,	423 N. Carroll Street.
Ulysses Grant Durfee,	Fredonia, N. Y.,	1112 W. Johnson Street.
Joseph William Fitch,	Madison,	415 Wisconsin Avenue.
John Dwight Freeman,	Madison,	222 Langdon Street.
Henry Charles Gier,	Black Earth,	825 University Avenue.
Clara Ballard Grant,	Lansing, Ia.,	Ladies' Hall.
Anna Jane Haswell,	Windsor,	140 E. Gorham Street.
Charles Dyer Hastings,	Kenosha,	1124 Johnson Street.
Elbert Earl Hawley,	Argyle,	341 W. Mifflin Street.
Ernest Lisle Heimbough,	Eau Claire,	716 State Street.
Bertha Henderson,	Cambridge,	933 Jenifer Street.
Carl Emil Hilbert,	Milwaukee,	613 Francis Street.
Addie Hinckley,	Brodhead,	Ladies' Hall.
Edward M. Hooper,	Oshkosh,	707 State Street.
Elma Lucretia Janes,	Madison,	816 University Avenue.
Alfred Theodore Johnson,	La Crosse,	314 Mills Street.
James Melvin Johnston,	Waupun,	501 University Avenue.
Adolph Kenneberg,	Ashland,	24 N. Fairchild Street.

* Died September 23, 1890.

Bertha Kellett,	Neenah,	640 State Street.
John James Kelley, Jr.,	Eau Claire,	727 W. Johnson Street.
Helen Julia Kellogg,	Madison,	206 State Street.
George Thomas Kelly,	Eau Claire,	613 Francis Street.
Edna Gertrude Kimball,	Superior,	803 State Street.
William G. Kirchoffer,	Elkhorn,	208 Monona Avenue.
George Nelson Knapp,	Madison,	408 W. Washington Ave.
Thormod Severin Kolste,	Madison,	116 N. Henry Street.
Frederick Kull,	Lake Geneva,	311 Park Street.
Nels Albert Ladd,	Stoughton,	631 State Street.
Walter Guy Law,	Chippewa Falls,	825 University Avenue.
George Washington Lebolt,	Chicago, Ill.,	217 N. Pinckney Street.
Wilhelm Hagbart Linderud,	Stoughton,	117 S. Butler Street.
Arthur C. Loomis,	Ft. Atkinson,	511 Francis Street.
Kathryn Erlin Matthewson,	Menasha,	Ladies' Hall.
Hubert McConochie,	Cambria,	340 W. Mifflin Street.
Julius Ferdinand Melaas,	Stoughton,	511 Francis Street.
Elizabeth Bennett Mills,	Madison,	222 Monona Avenue.
Effie Moore,	Chetek,	314 Mills Street.
Fred Milton Moore,	Fond du Lac,	519 Lake Street.
Liley Morton,	Cambridge,	Ladies' Hall.
Emma Andrea Nelson,	Madison,	1014 Williamson Street.
Sadie Uranah Newcomb,	Columbus,	803 State Street.
Anna Delia Nichols,	Viroqua,	Ladies' Hall.
William Nonhof,	Cedar Grove,	931 W. Johnson Street.
Irene Celia Norton,	Elkhorn,	Ladies' Hall.
Nellie Strong Noyes,	Oshkosh,	422 Murray Street.
Charles James O'Connor,	Sparta,	923 W. Johnson Street.
Erik John Ohnstad,	Cambridge,	714 State Street.
George W. Olmstead,	Allen's Grove,	411 Lake Street.
Willard Bela Overson,	Cambridge,	601 State Street.
Leafie Cushing Paige,	Oshkosh,	422 N. Henry Street.
Elisabeth Marshall Palmer,	Madison,	126 Langdon Street.
Warren Downes Parker, Jr.,	Madison,	422 N. Henry Street.
Claude Earle Patridge,	Oshkosh,	545 State Street.
Ada Philbrick,	Fennimore,	514 Lake Street.
Mary Eliza Pickarts,	Madison,	429 Park Street.
Owen Baxter Playter,	Eau Claire,	712 State Street.
Katherine Post,	Milwaukee,	712 Langdon street.
Edgar Alonzo Pratt,	Waupun,	719 State Street.
William Franklin Price,	Richl'd Center,	801 W. Johnson Street.
Dolly Radford,	Oshkosh,	Ladies' Hall.

Nona C. Reed,	Palmyra,	1122 W. Johnson Street.
Michael Kieran Reilly,	Fond du Lac,	727 W. Johnson Street.
George W. Rickeman,	Racine,	713 State Street.
Hans Sakarias Rikstad,	Madison,	721 E. Gorham Street.
Eliza Robinson,	Bangor,	217 W. Gilman Street.
Ella A. Ruebhausen,	Watertown,	1109 University Avenue.
Lenabell Sargent,	Ripon,	217 Gilman Street.
Arthur Romeyn Seymour,	Reedsburg,	512 Lake Street.
George Michael Shaffer,	Almond,	424 Francis Street.
Burt Russell Shurley,	Chicago, Ill.,	707 State Street.
James Kingsley Simpson,	Winona, Minn.,	613 Francis Street.
Milton Miles Smart,	Almond,	343 W. Washington Ave.
Eugene Albert Smith,	Madison,	224 W. Washington Ave.
Harker George Spensley,	Mineral Point,	412 Murray Street.
Alice Elizabeth Stephenson,	Madison,	206 S. Fairchild Street.
Minnie Margaret Stiles,	Columbus,	803 State Street.
George Lanman Strong,	Dodgeville,	314 W. Mifflin Street.
Burr Randolph Tarrant,	Durand,	635 State Street.
May Thomas,	Green Bay,	810 University Avenue.
William Thorbus,	Sparta,	923 W. Johnson Street.
John Enoch Webster,	Almond,	231 W. Gilman Street.
Paul Tupper Wilkes,	Sioux Falls, S. Dak.,	613 Francis Street.
Chauncey Lawrence Williams,	Madison,	625 Langdon Street.
John James Wright,	Madison,	15 E. Dayton Street.—118.

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COLLEGE OF LAW.

SENIOR CLASS.

George Washington Achard,	Minneapolis, Minn.,	311 N. Henry Street.
John Frank Bauschek,	Milwaukee,	218 N. Pinckney Street.
Conrad Henry Becker,	Mount Horeb,	905 E. Main Street.
William Grant Beebe,	New Lisbon,	9 S. Broom Street.
Claire Brayton Bird,	Madison,	810 E. Gorham Street.
John Christian Blix,	Madison,	127 University Avenue.
James Lawson Bonham,	Black Hawk,	223 N. Carroll Street.
Joseph Andrews Brown,	Duluth, Minn.,	327 W. Washington Ave.
Henry William Brown,	Lancaster,	Capitol House.
George Thompson Burrows,	Madison,	406 Pinckney Street.
John James Cameron,	Madison,	115 E. Johnson Street.
Hector N. B. Caradine,	Albany,	4 S. Carroll Street.
David Guy Classon,	Oconto,	115 E. Johnson Street.
Guy Pulford Cobb,	Mineral Point,	Capitol House.
Adrian Carlton Conway,	Albany,	124 W. Wilson Street.e.
Francis Herman De Groat,	Menomonee,	321 W. Washington Ave.
Allen Webster Dibble,	Evansville,	92 W. Johnson Street.
Frank Lewis Dinsmore,	Monticello,	115 E. Johnson Street.
Daniel Justin Donahoe,	Columbus,	627 University Avenue.
Loyal Durand,	Madison,	227 Langdon Street.
Fred Engelbracht, Jr.,	Berlin,	143 S. Butler Street.
Martin John Feeney,	Madison,	1031 W. Johnson Street.
Henry Edmund Fitch,	Madison,	415 Wisconsin Avenue.
Herman Emil Georgie,	Milwaukee,	17 S. Fairchild Street.
Elihu Bernard Goodsell,	Dodgeville,	311 N. Henry Street.
Stephen Addison Granger,	Milwaukee,	221 Langdon Street.
Ira Sherman Griffin,	Viroqua,	228 Mifflin Street.
Stephen Freeman Grover,	Menomonie,	114 N. Butler Street.
Otto Charles Hahn,	Watertown,	424 Wisconsin Avenue.
Jefferson Crawford Harper,	Madison,	311 W. Main Street.
John Brigham Hayner,	Janesville,	124 W. Wilson Street.
Daniel William Heffron,	Stevens Point,	107 E. Wilson Street.
George Frederick Heindel,	South Wayne,	218 E. Mifflin Street.
Walter Devereux Hickman,	Madison,	515 N. Carroll Street.
Frank Ward Hoard,	Fort Atkinson,	134 E. Gilman Street.

George B. McClellan Hudnall,	Rural,	107 W. Main Street.
Will Alfred Jackson,	Janesville,	620 State Street.
Edward Gaffield Jones,	Appleton,	341 W. Washington Ave.
Frederick William Kelly,	Milwaukee,	109 W. Washington Ave.
Patrick Joseph Kelly,	Milwaukee,	224 W. Mifflin Street.
Matthew Robert Killilea,	Milwaukee,	329 W. Washington Ave.
Frederick Andrew Kirschmann,	Madison,	216 State Street.
Thomas James Law, Jr.,	Shullsburg,	9 S. Broom Street.
Norma Lawrence,	Boscobel,	Ladies' Hall.
Pierre Albert Martineau,	Oconto,	115 W. Johnson Street.
Robert Bruce McCoy,	Sparta,	426 W. Gilman Street.
James Hurley McGillan,	Appleton,	422 N. Henry Street.
Andrew Robert Oleson,	Wisner, Neb.,	114 N. Butler Street.
Herman Oppenheim,	St. Paul, Minn.,	422 N. Henry Street.
Walter Cecil Owen,	Hayes City,	228 W. Miffln Street.
Arthur Parsons,	Dodgeville,	335 W. Wilson Street.
Lynn Spencer Pease,	Montello,	20 W. Mifflin Street.
Clesson Francis Pickard,	Metomen,	311 Brooks Street.
Carrie Hamilton Pier,	Milwaukee,	109 W. Washington Ave.
Harriet Hamilton Pier,	Milwaukee,	109 W. Washington Ave.
Thomas Remington,	Baraboo,	210 Langdon Street.
George Stephen Rix,	Spring Valley, Minn.,	311 Brooks Street.
James Darius Ryder,	Waterloo,	424 W. Wisconsin Avenue.
Winfield Robert Smith,	Milwaukee,	614 Langdon Street.
Frederick William Stearns,	Madison,	512 Wisconsin Avenue.
William Joseph Thayer,	Chicago, Ill.,	620 Langdon Street.
Vernon Howard Tichenor,	Milwaukee,	208 Monona Avenue.
Norman Emmons Van Dyke,	Monroe,	21 W. Doty Street.
Arthur Garrison Waite,	Sharon,	115 E. Johnson Street.
Herman Frank Wieman,	Jefferson,	1233 E. Dayton Street.
Henry Noah Winchester,	Oregon,	21 N. Butler Street.
Charles Gail Woolcock,	Waldwick,	311 N. Henry Street. 67—

JUNIOR CLASS.

Charles Edward Anderton,	Milwaukee,	334 W. Gilman Street.
John Lester Beebe,	Wisner, Neb.,	114 N. Pinckney Street.
Theodore John Berri,	Lodi,	108 N. Butler Street.
Edward Evarts Browne,	Waupaca,	206 N. Pinckney Street.
Andrew Alexander Bruce,	Madison,	525 State Street.
John Otto Carbys,	Thiensville,	112 W Dayton Street.
Eldon Joseph Cassoday,	Madison,	139 E. Gilman Street.
Henry B. Chappell,	Oregon,	231 W. Gilman Street.
Carlisle Royce Clarke,	Cambridge,	21 W. Doty Street.

Frederick James Coghlan,	Wood Lake, Minn,	416 Wisconsin Ave.
Willard Charles Cole,	Sheboygan,	209 W. Mifflin Street.
William Henry Coyne,	Madison,	716 Langdon Street.
Wardon Allan Curtis,	Madison,	534 State Street.
Charles Dent,	Georgetown,	223 N. Carroll Street.
Henry William Dietrich,	Mifflin,	311 N. Henry Street.
Charles Francis Dillet,	Stockbridge,	504 E. Main Street.
John Charles Fehlandt,	Madison,	119 S. Henry Street.
Frederick Felker,	Oshkosh,	18 W. Gilman Street.
George Edward Gray,	Sparta,	21 N. Butler Street.
William Thomas Green,	Milwaukee,	230 State Street.
Leo Haben,	Oshkosh,	18 W. Gilman Street.
Maximilian William Heck,	Racine,	Treasury Dept. Capitol.
Ernst Theodore Hessler,	Madison,	320 W. Gorham Street.
William David Hooker,	Milwaukee,	604 Francis Street.
John Eugene Horan,	Eau Claire,	24 N. Fairchild Street.
George Hoxie,	Clintonville,	14 E. Johnson Street.
Charles Adrian Ingram,	Durand,	527 State Street.
Francis Willard Jenkins,	Chippewa Falls,	24 N. Fairchild Street.
Theodore Kronshage, Jr.,	Boscobel,	635 State Street.
Ernest Agnew Kehr,	Milwaukee,	17 N. Fairchild Street.
James Bremer Kerr,	Madison,	140 Langdon Street.
Walter Alexander Marling,	Milwaukee,	613 Francis Street.
Thomas Jefferson Mathews,	Merrill,	115 E. Gilman Street.
Lawrence Austin Olwell,	Milwaukee,	334 W. Washington Ave.
Zebulon Pheatt,	Toledo, Ohio,	21 W. Doty Street.
Lawrence John Pingel,	Appleton,	21 W. Doty Street.
John Nelson Purcell,	Madison,	1 E. Main Street.
Joseph Myron Reed,	West Superior,	109 W. Washington Ave.
Charles Copeland Russell,	Janesville,	404 N. Henry Street.
Edward Henry Schwartzburg,	Milwaukee,	334 W. Washington Ave.
Russell Perkins Schuyler,	Chicago, Ill.,	424 Wisconsin Avenue.
George McFadden Shontz,	Bear Valley,	501 University Avenue.
Samuel T. Swansen,	Baldwin,	214 N. Baldwin Street.
Warren Down Tarrant,	Durand,	635 State Street.
David Henry Walker,	Oconto,	320 W. Gorham Street.
George Rose Whitman,	Dodgeville,	114 N. Pinckney Street.
Edward Frank Wieman,	Watertown,	501 University Avenue.
Edwin Alexander Wigdale,	Stoughton,	21 W. Doty Street.
Richard Claire Witte,	Milwaukee,	224 W. Mifflin Street.
Edward Liberty Wood,	Milwaukee,	226 W. Gilman Street.
Ernest Noble Warner,	Windsor,	140 E. Gorham Street.—51

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STUDENTS IN PHARMACY.

SENIOR CLASS.

Herman Robert Baumgarth, Jr	Milwaukee,	825 University Avenue.
Julius Bellack,	Watertown,	416 Francis Street.
Charles Frank Bieberman,	Oconomowoc,	231 W. Gilman Street.
William Prideaux Bliss,	Mineral Point,	525 State Street.
Oscar Theodore Erhart,	Columbus,	638 Langdon Street.
Edward Hellstern,	Madison,	23 N. Pinckney Street.
Gustave V. Kradwell,	Boscobel,	525 State Street.
Ernest Henry Madajefsky,	Appleton,	413 Lake Street.
John Lockwood Mead,	Appleton,	523 Lake Street.
Gustave Otto Schorse,	Milwaukee,	825 University Avenue.
Herman Albert Schuette,	Beaver Dam,	311 Lake Street.
Herman John Stoltz,	Milwaukee,	311 Lake Street.
Walter Anthony Trayser,	New London,	213 W. Gilman Street.
Everett George Tulledge,	Oakfield,	207 W. Gilman Street.
William C. F. Wallschlaeger,	Milwaukee,	638 Langdon Street.
Herman Frederick Weber,	Cedarburg,	413 Lake Street. —16

JUNIOR CLASS.

Clara May Abbott,	Westfield,	Ladies' Hall.
Fred Harris Allen,	Eau Claire,	638 Langdon Street.
Charles Xerxes Arps,	New Holstein,	115 W. Johnson Street.
Henry Leander Bacon,	Waupun,	501 University Avenue.
John Frank Bandelin,	Watertown,	231 W. Gilman Street.
Maurice Duane Bird,	Madison,	115 W. Johnson Street.
Nelson George Brazeau,	Oconto,	115 W. Johnson Street.
Herman Alex. Brennecke,	Watertown,	303 Park Street.
William Baron Calhoun,	Sparta,	701 Langdon Street.
Max Cohn,	Milwaukee,	821 University Avenue.
Otto Charles Detloff,	Chippewa Falls,	638 Langdon Street.
John Gallagher,	Racine.	830 W. Johnson Street.
Emily Laura Grote,	Mauston,	Ladies' Hall.
Charles John Habheger,	Watertown,	416 Francis Street.
Otto Hackendahl,	Milwaukee,	821 University Avenue.
Louis Coleman Haley,	Madison,	215 W. Washington Ave.
Frank Clarke Hamen,	Hudson,	424 Wisconsin Avenue.

Raymond Clifford Hargrove,	Madison,	1150 E. Johnson Street.
Henry Horn,	Marshfield,	17 S. Fairchild Street.
Edward Jacob Huber,	Fond du Lac,	613 Francis Street.
Frederick Kaiser,	Madison,	200 N. Pinckney Street.
August William Krehl,	Madison,	718 Jenifer Street.
Louis Henry Kressin,	Milwaukee,	411 Lake Street.
William George Kuntz,	Milwaukee,	411 Lake Street.
John Ernest Livingston,	Hazel Green,	224 Brooks Street.
William Charles Lueck,	Tomah,	17 S. Fairchild Street.
Don Judson McNaughton,	Franksville,	545 State Street.
Rudolph Herman Mieding,	Milwaukee,	830 W. Johnson Street.
Harry Erwin Norton,	Poynette,	115 E. Mifflin Street.
Henry August Peters, Jr.,	Oconomowoc.	207 W. Gilman Street.
Louis Winfield Potter,	Hurley,	830 W. Johnson Street.
Clarence Blackiston Raymond	Smyrna, Del.,	710 Langdon Street.
Adolphus Risken,	Shullsburg,	9 S. Broom Street.
Charles Wallice Scott,	Grand Rapids,	619 Francis Street.
Walter Robert Scott,	Eau Claire,	343 W. Washington Ave.
Ernest William Smith,	Amherst,	514 Lake Street.
William Wallace Taylor,	Sparta,	701 Langdon Street.
Charles Francis Tomkins,	Milton,	801 University Avenue.
Leopold Charles Urban,	Milwaukee,	830 W. Johnson Street.
William C. Ferdinand Witte,	Milwaukee,	303 Park Street. —40
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AGRICULTURAL STUDENTS.

LONG COURSE.

Given above in connection with other College Classes.

SHORT COURSE.

SECOND YEAR.

George Erickson, Carlton.
Herman F. Kohlwey, Grafton.—2.

FIRST YEAR.

O. W. Crary, Jr., Read, Iowa.
John Ewen, Francis Creek.
Gilbert E. Huntington, Eau Claire.
Willard C. Ingalls, Fond du Lac.
J. A. Linse, La Crosse.
Thomas F. Marston, Detroit, Mich.
Walter S. Martin, Mineral Point.
Carlton M. Miller, Madison.
Thomas E. Millman, Elk Grove.
Herman Reddelien, Stonebank.
J. J. Richardson, Dixon, Iowa.
L. F. Simenson, Belmond, Iowa.
Leo Stoeber, Elk Grove.
Mortimer R. Wiener, Buffalo, N. Y.
Richard Williamson, Madison.—15

DAIRY COURSE.

SECOND YEAR.

C. K. Bender, Oconomowoc.
Albert M. Benedict, Mazomanie.—2

FIRST YEAR.

E. L. Aderhold, New London.
Sever O. Amble, Black Earth.
Peter Ammon, Berlin.
W. D. Angus, Newry, Ontario, Canada.
Perry W. Atwood, Waupun.
Everett E. Austin, Rockbridge.
H. E. Bachelder, Fredonia, Kansas.
U. S. Baer, Balmoral.
C. H. Kelley, Farmington, Iowa.
Edward Koppeschaar, Spencer.
Charles Laufer, West Bend.
Charles Linton, Wilson.
Wm. S. Maxwell, Arkansaw.
Math. Michels, Calumet Harbor.
Graf E. Miles, Sextonville.
Edgar J. Moser, Galena, Ill.

A. T. Bell, Tavistock, Ontario, Canada.
F. A. Blanskey, Charleton.
G. W. Brasure, Montfort.
Charles Britzmann, Hellenville.
F. B. Brown, Richland City.
Sylvester Brown, Lodi.
L. W. Campbell, Cross Plains.
F. A. Chandler, Montfort.
George O. Cortte, Lomira.
Wm. H. Crary, Read, Iowa.
E. F. Ester, Burlington.
Henry Fink, Cream.
J. L. Gassett, Belleville.
Vincent Glawacek, Norman.
E. J. Graham, Mabel, Minn.
Wm. W. Gray, Newry, Ontario, Canada.
Harry C. Haecker, Cottage Grove.
T. L. Haecker, Madison.
George Hansen, Allenton.
J. B. Harris, Antwerp, N. Y.
W. J. Harris, Black Earth.
Forest H. Hastings, Oconomowoc.
Theophil Helg, Haubstadt, Ind.
Preston M. Hird, Livingston.
George J. Howarth, Kingston, Ill.
J. N. Jacoby, South Byron.
Walter Judevine, Clifton.
O. M. Orvold, Stoughton.
W. H. Phillips, Waupun.
E. L. Ross, Dayton.
F. F. Ross, Iowa City, Iowa.
Peter Ruetten, Ithaca.
Henry Schlosser, Bremen.
Wm. Scholl, Richland Center.
Herman Schroeder, Platteville.
J. W. Seaman, Richland City.
Alvin Shanton, Watertown.
S. H. Silkworth, Osseo.
Dolph Simmons, Viola.
W. E. Simpson, Princeton, Ind.
Archie M. Smith, Fremont.
B. H. Stahman, Pine Knob
Walter Steinbrecher, Manitowoc.
I. W. Steinhoff, Sebringville, Ontario, Canada.
Charles A. Stephens, Platteville.
Ira Studebaker, Yellow Creek, Ill.
Charles Swarts, Arkansaw.
Wm. H. Travers, Woodstock.
W. H Verity, Appleton.
Fred Walvoord, Cedar Grove.
W. H. Werner, Jr., Brillion.
George S. Wilson, Mazomanie.
John H. Wood, Lodi.
F. H. Worthington, Albion, Mich. —70

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STUDENTS IN SUMMER SCHOOL FOR TEACHERS.

Fourth Annual Session, 1890.

Alice J. Amy,	Baraboo,	Intermediate, Baraboo.
Anna M. Anderson,	Stoughton,	Assistant Principal, Stoughton.
Grace A. Barber,	Baraboo,	District No. 4, Sumter.
Mary A. Barber,	Sparta,	
Frank W. Barker,	Florence,	Principal, Florence.
J. Henry Bartlett,	Philadelphia, Pa.,	Superintendent Friends' School.
Nellie S. Bennett,	Dodgeville,	Assistant High School, Dodgeville.
Victor L. Berger,	Milwaukee,	District School No. 8.
Adolph Bernhard,	Milwaukee,	Mathematics, National German American Teachers' Seminary.
Emma B. Blood,	Elo,	Grammar, Florence.
Fredrica Bodenstein,	Madison,	Grammar, Madison.
Jennie Bonfoey,	Milwaukee,	Seventh Grade, Milwaukee.
Mary Boothroyd,	Edgerton,	Albion Academy, Normal Department.
Inez Bosworth,	Minneapolis, Minn.,	Primary Department, Minneapolis.
Mrs. Mary D. Bradford,	Kenosha,	Assistant High School.
Charles J. Brewer,	Ellsworth,	Principal, Ellsworth.
Sarah Edith Brown,	Madison,	Student, University of Wisconsin.
Daniel F. Burnham,	Waupaca,	Principal Palmyra Graded School.
Fannie J. Burton,	Reedsville,	Principal Grammar School, Colby.
Kate E. Cary,	Racine,	Assistant, Grammar, Racine.
Marie T. Chamberlain,	Waupaca,	Grammar Department, Waupaca.
Margaret M. Champer,	Madison,	Second Primary, Madison.
Kate L. Christman,	Minneapolis, Minn.,	Primary, Minneapolis.
Henry Fitch Clark,	Baltimore, Md.,	Student, Johns Hopkins University.
Susie Cocroft,	Madison,	State Superintendent's Office.
Meta M. Constance,	Waupaca,	Primary Grade, Waupaca.
Marian E. Cox,	St. Louis, Mo.,	Chemistry, Manual Training.
Mary Coyne,	Madison,	Grammar, Eau Claire.
Albert W. Dassler,	Kiel,	Principal High School, Kiel.
Hiram D. Densmore,	Beloit,	Professor Botany, Beloit College.
George E. Dietrich,	Avoca,	Principal High School, Linden.
Katherine Dignan,	Milwaukee,	Assistant Ninth District School.
Francis W. Dockery,	Whitewater,	Student, University of Wisconsin.
Mary E. Dodson,	Berlin,	
Mary E. Dougherty,	Grand Rapids,	Principal Ward School, Stevens Point.
Margaret S. Edington,	Milwaukee,	Mathematics, Milwaukee High School.
John T. Edwards,	Washburn,	Principal, Elkhorn.
Charles H. Elkinton,	Oakfield,	Principal, Oakfield High School.
Kate H. Feeney,	Madison,	First Primary, Madison.
Albert C. Finn,	Madison,	Student, University of Wisconsin.
Lucinda J. Flemming,	Middleton,	

Albert H. Fletcher,	Knapp,	Principal High School, East Troy.
Joseph Freehoff,	Sigel,	Student, University of Wisconsin.
Emma J. Gardner,	Milwaukee,	First Assistant, 12th District School.
Annie M. Garriety,	Superior,	Primary, Superior.
Anna Glennon,	Baraboo,	District School, Sumter.
John C. Hart,	Berlin,	Principal Grammar, Berlin.
Elizabeth Gray,	Milton,	
Luise Hæssler,	Milwaukee,	German, 12th Dist. School, Milwaukee.
Carrie A. Harper,	Madison,	Second Primary, Madison.
Agnes Harris,	Milbank, So. Dak,	Ass't Prin. High School, Milbank.
Josephine Hatch,	Big Spring,	Student, University of Wisconsin.
Rosalia A. Hatherell,	Janesville,	Normal School, River Falls.
Willard R. Hemmenway,	La Crosse,	Ass't Prin. High School, LaCrosse.
Hiram Hensel,	Arcadia,	Assistant Principal, Arcadia.
Willard A. Hodge,	Marshall,	Principal High School, Marshall.
John I. Jegi,	Blair,	Principal Graded School, Blair.
Mattie S. Johns,	Dodgeville,	Assistant High School, Dodgeville.
Caroline S. Johnson,	Waukesha,	Carroll College Academy.
Louis Kahlenberg,	Two Rivers,	Student, University of Wisconsin.
Harriet G. King,	Oak Park, Ill,	Assistant High School, Oak Park.
Lilla King,	Whitewater,	Science, High School, Whitewater.
George W. Krall,	St. Louis, Mo.,	Manual Training School, St. Louis.
Clara Kroncke,	Madison,	Teacher of German, Chicago.
Mildred Lakin,	Milwaukee,	Assistant High School, Milwaukee.
George L. Leslie,	Luverne, Minn,	Superintendent of Schools, Luverne.
Azariah T. Lincoln,	Montfort,	Principal, Independence.
Franklin A. Lowell,	Waupaca,	Superintendent of Schools, Waupaca.
Mrs. Mary Lowell,	Waupaca,	
John H. Martin,	Oregon,	Superintendent of Schools, Viroqua.
Maggie Mayers,	Madison,	Principal Sixth Ward, Madison.
Hannah C. McConville,	La Crosse,	Fifth Grade, 6th District, La Crosse.
Hubert McConochie,	Cambria,	Student, University of Wisconsin.
Charles W. McCurdy,	Winona, Minn,	Science, Winona High School.
Frank E. McGovern,	Madison,	Principal, Brodhead.
Mary McGovern,	Madison,	Principal 2d Ward, Madison.
Mary L. McKenzie,	Waupaca,	Intermediate, Bergen, N. Y.
Alonzo McKinley,	Manawa,	Principal Little Wolf High School.
Jennie McMillan,	Madison,	Principal 5th Ward, Madison.
Harlow McMillen,	Avoca,	Principal, Avoca.
Amelia McMinn,	Chicago, Ill.,	Hillside Home School, Wisconsin.
Fred W. Meisnest,	Montello,	Principal Montello High School.
Hattibel Merrill,	Milwaukee,	Assistant High School, Milwaukee.
Balthasar H. Meyer,	Port Washington,	Principal High School, Port Washington.
Ida Miller,	Watertown,	Seventh Grade, Watertown.
Margaret Morris,	Wyoming, Ohio.	Assistant High School, Wyoming.
William L. Morrison,	Mauston,	Principal High School, Mauston.
Annetta Nelson,	Madison,	Sixth Grade, Milwaukee.
Charles H. Nye,	Platteville,	Normal School, Platteville.
John O'Connell,	Montelle,	Sup't of Schools, Tomahawk.
Anna Parmelee,	Polo, Ill,	Assistant, High School, Sterling, Ill.
Mary K. Petersen,	Racine,	First Grade, 6th District, Milwaukee.
Fred. W. Plapp,	Dubuque, Iowa,	Ass't Prin. High School, Dubuque.

Margaret I. Potter,	Watertown,	Assistant, High School, La Crosse.
William Promberger,	Milwaukee,	Assistant 12th District School, Milwaukee.
Margery E. Rich,	Waupaca,	Assistant, Principal High School, Waupaca.
John H. Rindlaub,	Platteville,	Student, University of Wisconsin.
Cornelia Rogers,	Whitewater,	Normal School.
Ella Rothschild,	Lancaster,	Grammar Department, Muscoda.
J. Dewey Rouse,	Springfield,	Principal, Galesville.
William J. Savage,	Camanche, Iowa,	Principal, Camanche.
Florence Sanborn,	Stevens Point,	Assistant, High School, Stevens Point.
Pauline Saveland,	Milwaukee,	Assistant, High School, Milwaukee.
Carl E. Schlabach,	DeWitt, Iowa,	Principal Schools, DeWitt.
Katherine Schlegel,	Stevens Point,	Assistant, High School, Stevens Point.
Edward W. Schmidt,	Northfield, Minn.,	Lutheran College, Classics, Red Wing.
Charlotte H. Schrœder,	Kenosha,	Seventh and Eighth Grades, Kenosha.
Lillie J. Sherman,	Dodgeville,	Second Intermediate, Dodgeville.
Mary L. Silliman,	Lake Mills,	District School, Farmington.
Ella E. Snyder,	Madison,	Kindergarten, Delavan.
Jessie I. Spafford,	Rockford, Ill.,	Math. and Phys., Rockford Seminary.
Annie M. Sullivan,	Racine,	Third and Fourth Grades, Racine.
Murtie E. Sullivan,	Independence,	Principal High School, South Stillwater.
Charles H. Sylvester,	Whitewater,	Principal High School, Whitewater.
Mrs. Frances A. Temple,	Austin, Ill.,	Assistant, High School, Austin.
Howard L. Terry,	Lake Mills,	Principal High School, Lake Mills.
Milton E. Terry,	Lake Mills,	
David K. Tone,	Madison,	Principal High School, Cambridge.
Mary A. Torphy,	Barneveld,	Principal Graded Schools, Barneveld.
Augusta Tovell,	St. Louis, Mo.,	Normal School, St. Louis.
Elizabeth E. Trainor,	Ottawa, Ill.,	Principal Shabbona School, Ottawa.
Clara W. Uglow,	Palmyra,	Grammar, Whitewater.
Pauline I. Voss,	Watertown,	Language, High School, Watertown.
Jennie E. Waldo,	Rockford, Ill.,	Assistant, Rockford High School.
Elmer W. Walker,	Black Earth,	Principal, Black Earth.
Fred J. Watson,	Chicago, Ill.,	Science, N. W. Div. H. S., Chicago.
John C. Weinzirl,	Eau Galle,	Principal, Graded School, Cedar Falls.
Emma Wieman,	Necedah,	
Mary M. Wieman,	Madison,	
Jennie L. Wise,	Madison,	Primary, Stoughton.
Jennie Wright,	Milwaukee,	

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SUMMARY OF STUDENTS.

Fellows,		9
Resident Graduates,		15
**Candidates for Second Degrees,*		30
Senior Class—		
Ancient Classical Course,	12	
Modern Classical Course,	22	
English Course,	31	
General Science Course,	15	
Civil Engineering Course,	6	
Mechanical Engineering Course,	7	
Railway Engineering Course,	3	
Special Students,	2	
	—	98
Junior Class—		
Ancient Classical Course,	9	
Modern Classical Course,	13	
English Course,	23	
General Science Course,	16	
Civil Engineering Course,	8	
Mechanical Engineering Course,	10	
Electrical Engineering Course,	1	
Mining Engineering Course,	1	
Agricultural Course,	3	
Special Students,	23	
	—	106
Sophomore Class—		
Ancient Classical Course,	8	
Modern Classical Course,	17	
English Course,	45	
General Science Course,	12	
Civil Engineering Course,	9	
Mechanical Engineering Course,	13	
Electrical Engineering Course,	4	
Agricultural Course,	1	
Special Students,	70	
	—	179

*Arrangements having been made for more effective supervision of the work of students *in absentia*, they are now included in the summary of students.

Freshman Class—		
Ancient Classical Course,	17	
Modern Classical Course,	25	
English Course,	45	
General Science Course,	21	
Civil Engineering Course,	12	
Mechanical Engineering Course,	17	
Electrical Engineering Course,	10	
Agricultural Course,	1	
Special Students,	118	
	—	266
Law—		
Senior Class	67	
Junior Class,	51	
	—	118
Pharmacy—		
Senior Class,	16	
Junior Class,	40	
	—	56
Agricultural—		
Short Course, Second Year,	2	
Short Course, First Year.	15	
Dairy Course, Second Year,	2	
Dairy Course, First Year,	70	
	—	89
Summer School for Teachers,	131	966

SUMMARY BY COLLEGES.

College of Letters and Science,	558	
College of Mechanics and Engineering,	137	
College of Agriculture,	97	
College of Law.	118	
School of Pharmacy,	56	
	—	966
Summer School for Teachers,	131	

ORGANIZATION OF THE UNIVERSITY.

The University embraces:

I. The College of Letters and Science.
II. The College of Mechanics and Engineering.
III. The College of Agriculture.
IV. The College of Law.
V. The School of Pharmacy.

The College of Letters and Science embraces:

I. Graduate and Fellowship Courses.
II. The Ancient Classical Course.
III. The Modern Classical Course.
IV. The General Science Course.
V. The English Course.
VI. The Civic-Historical Course, antecedent to Law and Journalism
VII. The Special Science Course, antecedent to Medicine.
VIII. The Special Courses for Normal School Graduates.

The College of Mechanics and Engineering embraces:

I. The Civil Engineering Course.
II. The Mechanical Engineering Course.
III. The Mining and Metallurgical Engineering Courses.
IV. The Railroad Engineering Course.
V. The Electrical Engineering Course.

The College of Agriculture embraces:

I. The Experiment Station.
II. The Graduate Courses.
III. The Long Agricultural Course.
IV. The Middle Agricultural Course.
V. The Short Agricultural Course.
VI. The Dairy Course.
VII. The Farmers' Institutes.

The College of Law embraces:

I. The Law Course.

The School of Pharmacy embraces:

I. The Graduate Course.
II. The Pharmacy Course.

GENERAL POLICY.

It is the general policy of the institution to foster the higher educational interests of the State, broadly and generously interpreted. It is its aim to make ample provision for the demands of advanced scholarship in as many lines as its means will permit. By prescribing the larger portion of the studies of the regular courses in the earlier years, and by leaving the larger number in the later portion to the selection of the student, it endeavors to give a wise measure of direction and at the same time leave sufficient room for choice to secure individual adaptation and special development.

The University endeavors to avoid all that is sectarian or partisan without withdrawing its sympathy and influence from whatever contributes to good citizenship and high character. Subjects which constitute party questions will be avoided in the courses of study.

The University recognizes no distinctions of race, color or sex. All who conform to its intellectual and moral requirements are equally entitled to its privileges.

GOVERNMENT.

The government of the institution rests upon the inherent obligations of students. The University is maintained at the public expense for the public good. Those who participate in its benefits are expected, as a matter of honor, not only to fulfill the obligations of loyal members of the institution, of the community and of the commonwealth, but to actively aid in promoting their intellectual and moral interests. Every student owes to the public a full equivalent for its expenditure in his behalf, in the form of superior usefulness to it, both while in the institution and afterwards. Students therefore not only can not claim any peculiar exemption from the duties of good citizens and of dutiful members of the community and of the University, but are under peculiar obligations to loyally fulfill these. As members of the institution, they are held responsible for faithful attendance and the proper performance of their duties. The interests of faithful students and the well-being of the University demand that those who do not conform to these manifest obligations should be excluded. As members of the community, students are amenable to the law as other citizens, and, if guilty of its infraction, are liable to its penalties and to a termination of their relations with the University. The University recognizes throughout its civic relations and rests its administration upon civic obligation.

METHODS OF WORK.

The methods of work embrace those that have proved efficient in the experience of similar institutions. Recitations, emancipated from servile text-book work, hold a large place. Lectures, especially in the departments admitting of experimental and objective illustration, also occupy a large place. Freedom of discussion and questioning by the student accompany both methods. The laboratory system is fully employed in all the departments in which it is practicable.

The German seminary system is being gradually introduced into the several departments to which it is adapted. The facilities for this work are being enlarged as fast as practicable.

LIBRARIES.

The General University Library contains about 25,000 volumes, including pamphlets, and is open to students every day from 8:45 A. M. to 5:30 P. M., excepting legal holidays and Sundays. The best American and foreign periodicals are taken. The College of Law, the Observatory, the Experiment Station and the several scientific, technical and other departments have special libraries, aggregating about 8,000 volumes.

Students have also free access to the State Historical Library, numbering above 140,000 volumes, including pamphlets. It has no equal in richness of material relative to the history of the Interior, and affords exceptional facilities for advanced historical work. The Historical Seminary of the University has been generously granted special facilities within its rooms.

Students also have free access to the State Law Library, comprising over 23,000 volumes.

Students, by special arrangements, are enabled to take out books from the free library of the City of Madison. This is a well-selected collection of about 12,000 volumes.

These library privileges, embracing a total of more than 200,000 volumes, are unsurpassed in the West, and equalled by very few institutions in the country.

LABORATORIES.

CHEMICAL LABORATORIES.—The Chemical Laboratories, six in number, are in a building devoted exclusively to Chemistry. Three of these are general laboratories, viz.:

First. The Qualitative Laboratory, with accommodations for ninety-six students ;

Second. The Organic Laboratory, accommodating thirty-two students; and,

Third. The Quantitative Laboratory, accommodating forty-eight students.

These laboratories are large, well-lighted, conveniently arranged, and well supplied with the necessary apparatus and equipments.

Of the three special laboratories, one is for Gas-analysis, one for Urin-alysis, and one for Toxicology.

Physical Laboratories.—The Physical Laboratories contain an excellent outfit of apparatus of the latest designs and of the most approved manufacture. They embrace a very complete set of sound apparatus by Koenig of Paris, including a Scheibler's tonometer, a complete set of discs, pipes and forks to illustrate the production of combination tones, and a *sirene à onde*, in addition to the usual outfit of pipes, manometric flame apparatus, etc. In the department of optics may be especially mentioned large nicol prisms, two and one-half inches in diameter, a polariscope, spectroscopes by Brashear and Steinheil, a very perfect optical comparator for small scales with screw by Rogers, a photometer, a projection apparatus, and plane and curved diffraction gratings by Rowland.

Among thermal apparatus may be especially mentioned an air thermometer, calorimeters and other standard apparatus.

Among the electrical and magnetic apparatus are a complete set of Sir Wm. Thomson's instruments for electrical measurements, including a new form of magnetometer by Dr. Gray, electro-dynamometers, voltmeters, amperemeters, resistance boxes, galvanometers, condensers, and other test instruments for electrical engineering. There are also electrometers by Thomson and Edelmann, electric motors, storage batteries, a large Ruhmkorff coil, a Brackett cradle for measuring electrical power, a very full set of Crooke's tubes, switches, standards of electro-motive force, etc. There is a constant potential dynamo in the laboratory and a fifteen arc light dynamo in the Machine Shop with suitable connection with the laboratory.

The Mineralogical Laboratory.—The Mineralogical Laboratory has reagents and other necessary apparatus for complete courses in blow-pipe analysis and determinative mineralogy. There is a collection of hand specimens of minerals for laboratory use, and, for comparative purposes, the students have access to the large collections in the cabinet. A small room has been fitted with curtain, to act as a goniometer room, and is supplied with a large reflection goniometer and the complete *Universal-apparat* of Fuess, and a goniometer lamp.

The mineralogical lecture room is supplied with a complete set of about 150 glass crystal models by F. Thomas, of Siegen, a selected series of

wooden crystal models from Kranz, of Bonn, Bohm and Wiedermann's wave-surface and dispersion models, Brill's plaster models of surfaces of elasticity, etc., Werlein's models to show the characters of dispersion in monoclinic crystals, and a series of axis-systems.

Petrographical Laboratory.—The Petrographical Laboratory is large and well lighted. It contains at present fourteen microscopes, three by Voigt & Hochgesang, seven by Nachet, and four by Fuess, including one first-class stand by each of the two last. The large Fuess is supplied with an unusually complete set of excellent eye-pieces, objectives, and accessories. The laboratory has heavy liquids for separating rock constituents, and a Westphalen balance to determine their specific gravity. The collections of the laboratory are as follows: About 200 sections of minerals, cut in definite directions, 100 of which are Professor Klein's set as prepared by Voigt & Hochgesang; the Sturz set of European rock specimens and thin sections, known as the Rosenbusch collection; a set of American rocks, accompanied by thin sections, by Julien; and the thin sections of the State Geological Survey. There is also available the very extensive collection of rocks and thin sections from the Pre-Cambrian rocks of North America, belonging to the Lake Superior Division of the United States Geological Survey. This collection is one of the largest of its kind in the world, containing over 8,000 thin sections, and is particularly valuable to advanced students.

The lecture room for geology is provided with a full set of refeerenc manuals; a set of Zittel's Palæontologische Wandtafeln; a set of Shaler's models and photographs; a set of Davis' models showing the development of topographic features; numerous geological maps; a large collection of lantern slides; Newton's large electric projecting lantern, and other apparatus. The Newton lantern is adapted for projecting ordinary lantern slides, and has a front for microscopic slides which projects directly on the screen thin sections of rocks both in the ordinary and polarized light.

The Biological Laboratories.—The elementary laboratory for the departments of botany and zoology is arranged to accommodate 72 students, and is provided with compound microscopes, dissecting microscopes, and other apparatus necessary to an elementary course in botany and zoology. The departments have about 70 compound microscopes, chiefly by Leitz and Bausch & Lomb, fitted for elementary and advanced work, including seven microscopes furnished with oil immersion objectives.

The laboratories for advanced work in botany are fitted up with the apparatus and reagents necessary to an advanced course in vegetable histology, and to a course in vegetable physiology. Among the more

important pieces of apparatus are a Ryder microtome, a Vogel's direct vision spectroscope, a metallic registering thermometer, a clinostat and an auxanometer.

The laboratories for advanced work in zoology are two in number, one being devoted to bacteriology and histology, and the other to vertebrate anatomy and embryology. The histological laboratory is provided with a full equipment of the reagents, microtomes of various paterns, and microscopes necessary to a full course in histology. In the laboratory for bacteriology, there is a very fine set of apparatus for the study of bacteria, by Dr. Rohrbeck of Berlin, including the best patterns of thermostats and sterilizers. The anatomical laboratory is furnished with a collection of vertebrate skeletons and of wax models illustrating the development of some of the more important vertebrates and invertebrates. For illustrating the lectures in botany and in zoology, there are Auzoux models, both of plants and animals, an electric projecting lantern and microscope by Newton & Co., London, over 500 photograms for lantern use, a largenumber of wall charts, microscope slides, etc.

The Psychological Laboratory.—The laboratory is intended for practically illustrating the courses in psychology, for giving an opportunity to the students of experimental psychology to study the methods of this promising and rapidly progressing science and for the encouragment of original research under the guidance of the professor. Considerable apparatus has been purchased abroad and many pieces have been made at the machine shops of the University. The equipment includes æsthesiometers, test weights, pressure apparatus and other instruments for the study of the sense of touch, color testing machines, eye-muscle model, revolving apparatus for discs, perimeter and stereoscopes, and a variety of accessory apparatus for the study of vision, a Hipp chronoscope, with a special control machine, a revolving drum, an Ewald interruption counter, tuning forks, induction coil, and accessory apparatus for the study of the duration of mental acts. Apparatus belonging to other departments is also available for demonstration and for other uses. Original research has been carried on through the whole of the current year and the results will be published in the American Journal of Psychology, in which one series of studies from this laboratory have already appeared. Efforts will be made to supply the best opportunities for having students test for themselves the points studied and of illustrating the methods by which the results now accepted have been obtained. It is intended to make the laboratory an essential and important feature of the work in psychology.

The engineering, assaying, pharmacy and agricultural laboratories are described under their respective departments.

MUSEUMS.

THE GEOLOGICAL AND MINERALOGICAL MUSEUM. During the year the geological and mineralogical museum has been supplied with cases for the storage and exhibition of the new collections, and these have been arranged and labeled.

Relief Models. For illustration in general and structural geology the collection embraces large topographico-geological models of the Colorado Cañon, the Henry Mountains, the Auvergne, the Yosemite Valley, the Uintah Mountains, Mt. Vesuvius, the Leadville Region, etc.

Palæontological Collection. This embraces a fair number of Ward & Howell's casts of gigantic fossil forms, including *Megatherium Cuvieri*, *Glyptodon*, the skull and tusks of *Elephas ganesa*, *Dinotherium* and *Mastodon*, and an unusually good set of Mesozoic reptilian forms. The systematic collection of fossils consists of a carefully selected series, embracing all geological horizons, obtained by purchase, and the *Powers Collection*, the generous gift of Mr. H. C. Powers of Chicago. This latter collection is especially rich in fossils of the Trenton and other Silurian deposits of Wisconsin. The larger and finer specimens have been systematically arranged in glass cases, according to formation, for the benefit of the public. The residue form a very complete working collection, which have been arranged in drawers on the same principle.

Students have access to the collection of the Wisconsin Academy of Science, which contains the type specimens described in the official reports of the last State Geological Survey.

The Mineral Collection. The systematic collection of minerals contains 2,500 to 3,000 specimens, fairly representing the different groups and containing many rare specimens. With a view to the impressive illustration of mineralogical types, the larger and many of the smaller but choice specimens have been displayed in glass cases. The order of arrangement for the non-silicate minerals is based on that of Groth in the last edition of his tables (1889). The silicates have been arranged on a geological basis in the belief that relations will be more clearly brought out than if a purely chemical one is adopted.

The Henry Collection. The University has recently purchased the W. T. Henry collection, consisting of from 30,000 to 40,000 specimens. It is especially representative of the lead and zinc ore-deposits of southwestern Wisconsin and adjoining states, and is exceptionally complete in its exhibition of the various forms of ore, of the order of deposition, and of the pseudomorphic changes that have taken place in the original deposits. Crystallographically the collection is valuable from the specimens of calcite, cerussite, azurite, galena and sphalerite. The large number

of duplicate specimens will be utilized in enlarging the collection by exchanges.

Rock Collection. This collection is now stored in the petrographical laboratory, where it is daily accessible to students. It embraces the Sturz collection of typical European rocks, and the Julien collection of typical American rocks, as well as a miscellaneous collection obtained from various sources.

Metallurgical Collection. This collection, illustrating the metallurgy of the different metals, contains specimens representing the ores of each and the products of the different reducing processes. It has been systematically arranged and placed for convenient use in the mineralogical lecture room.

The Geological and Mineralogical Museum will be accessible to the public on certain days of the week, which will be made known through the Madison newspapers. Access may be gained by visitors at all reasonable hours by calling upon the janitor of the building.

THE WASHBURN OBSERVATORY.

The Washburn Observatory is excellently equipped for astronomical work. Its principal instruments are: An equatorially mounted telescope of 15½ inches aperture, constructed by Alvan Clark & Sons, and provided with graduated circles, driving clock, a filar micrometer, and a very complete set of eye-pieces; a meridian circle, by A. Repsold & Sons, of Hamburg, with collimators, and the usual accessories of such an instrument. This instrument is figured in the last edition of the Encyclopedia Britannica as the type of its class. The objective of this instrument was made by the Clarks, and has an aperture of 4.8 inches and a focal length of 58 inches. The circle is graduated to 2′. A floating mirror has recently been added to this instrument as an auxiliary for the determination of its horizontal points and flexures. There are also a sidereal clock by Höhwü of Amsterdam, two mean-time clocks by Howard of Boston, all excellent time pieces, and a chronograph by Fauth & Co., of Washington.

In the Students' Observatory are mounted a six-inch equatorial telescope by Alvan Clark & Sons, and a combined transit and zenith telescope by Fauth & Co. These instruments, while primarily intended for instruction, are well adapted to and are employed for certain classes of original work. In particular, the equatorial telescope has been provided with reflecting prisms (Loewy), and is now employed as one of the principal instruments of the Observatory in an investigation of the refraction and the constant of aberration. The Observatory also possesses a considerable number of subsidiary instruments, such as

chronometers, sextants, an altazimuth, a spherometer caliper, seismoscopes, and a complete set of meteorological instruments.

The Woodman Astronomical Library, established in connection with the Observatory, possesses a large and valuable collection of works upon astronomy and kindred subjects.

The working force of the Observatory has for some years been largely devoted to the determination with the meridian circle of accurate positions of the fundamental stars, including a study of the errors of the instruments and a precise determination of the latitude of the Observatory.

During the last two years the large equatorial has been employed in the measurement of double stars and the occasional observation of planets, comets and phenomena of current interest.

Meteorological observations are regularly taken and communicated to the Signal Office at Washington.

Students of sufficient technical attainments are admitted to the Observatory, and take part in the investigations in progress. Meritorious original work of such students will be included in the publications of the Observatory.

PUBLICATIONS.

By provision of law the results of important investigations conducted at the Washburn Observatory are published by the State, and under this provision five volumes have been issued representing the more important work done at the Observatory prior to June, 1887. Volume VI, parts 1 and 2, and volume VII, part 1, have been recently issued.

PHYSICAL TRAINING.

Military drill is required of the young men of the Freshman and Sophomore classes, and of special students of the first two years attendance. The lower campus, a level area, furnishes facilities for ball, tennis and other physical sports. The University is situated on the shores of Lake Mendota, a beautiful sheet of water, which invites exercise and recreation in boating.

NEW ARMORY.

Through the liberal appropriation made by the last legislature means are provided for the construction of a new armory of the most approved order. To the armory proper will be added the appointments of a first-class gymnasium.

LADIES' GYMNASTICS.

Systematic courses in gymnastics for the ladies are maintained in Ladies' Hall under the immediate direction of a trained instructor—a graduate of Allen's Gymnasium of Boston—and under the general supervision of a thoroughly educated lady physician,

DEGREES.

FIRST DEGREES.

The baccalaureate degrees are conferred at graduation upon those who have successfully completed the regular courses leading to degrees, and who have conformed to the requirements of the University. The degrees for the several courses are as follows:

ACADEMIC.

BACHELOR OF ARTS, for the Ancient Classical Course.
BACHELOR OF LETTERS, for the Modern Classical Course.
BACHELOR OF SCIENCE, for the General Science Course.
BACHELOR OF LETTERS (ENGLISH), for the English Course.

PROFESSIONAL.

BACHELOR OF LAWS, for the Law Course.
GRADUATE IN PHARMACY, for the Pharmaceutical Course.

TECHNICAL.

BACHELOR OF AGRICULTURE, for the Agricultural Course.
BACHELOR OF CIVIL ENGINEERING, for the Civil Engineering Course.
BACHELOR OF MECHANICAL ENGINEERING, for the Mechanical Engineering Course.
BACHELOR OF MINING ENGINEERING, for the Mining Engineering Course.
BACHELOR OF METALLURGICAL ENGINEERING, for the Metallurgical Engineering Course.

The graduate of any one of the courses may receive the baccalaureate degree of any other course by completing the additional studies required in that course, but two baccalaureate degrees cannot be taken in one year.

SECOND DEGREES.

The degrees of Master of Arts, Master of Letters, Master of Science and Master of Letters (English), are conferred upon graduates of the University who have previously taken the degrees of Bachelor of Arts, Bachelor of Letters, Bachelor of Science and Bachelor of Letters (English), respectively, and who, after graduation, have pursued an approved course of study equivalent to the work of one year in the graduate department of the University, and who present a satisfactory thesis upon the leading subject pursued. This work may be done at the University or elsewhere, but unless it be done at the University, or in connection

with some institution of high rank, it will be assumed that a longer time and a larger nominal amount of study will be requisite to give the equivalent attainment, and the degree will not be conferred until three years after graduation. The work must be in the general line of advanced study implied by the degree sought, and must be approved by the Committee of the Faculty having the subject in charge. Two-thirds of this study must be devoted to one department or to closely allied departments. Study for a profession will not be accepted, but original investigation in connection with a profession or special and scholarly study collateral to it may be accepted, in the discretion of the Committee of the Faculty. An examination upon the work done is required, and the thesis should be presented at least one month before the close of the academic year.

Graduates of this or of similar institutions who pursue the course in law at the University, and who, by reason of their superior training, are able to take an additional study advantageously, may receive their second degree on graduation from the Law School by pursuing satisfactorily one consecutive full study in the graduate department of the University during the two years of their course, and by conforming to the other required conditions.

The degrees of Civil Engineer, Mechanical Engineer, Mining Engineer and Metallurgical Engineer are conferred as second degrees upon bachelors of Civil, Mechanical, Mining and Metallurgical Engineering, respectively, (1) who pursue advanced professional study at the University for one year, and present a satisfactory project or thesis; or (2) who pre sent suitable evidence of three years of professional work, of which one must be in a position of responsibility, accompanied by professional study.

The degree of Master of Pharmacy will be conferred upon graduates in pharmacy who satisfactorily complete a course of one full year (three terms) at the University in advanced pharmacy or in some science or sciences specially allied to pharmacy and who shall present a satisfactory thesis embodying the results of original investigation.

The University offers its higher degrees to graduates of other colleges of high standing who shall reside at the University and pursue the requisite studies under the immediate direction of the Faculty.

The Committees on second degrees are as follows:

For the degree of M. A., Professors Kerr and Bennett.

For the degree of M. L., Professors Parkinson and Freeman.

For the degree of M. S., Professors Daniells and Birge.

For the degree of M. L. (English), Professors Stearns and Freeman.

For all the second degrees in Engineering, Professors Van Hise, Bull and Hoskins.

THIRD DEGREES.

The degree of Doctor of Philosophy will be conferred upon successful candidates after three years of graduate study, two of which must be pursued at this University. This degree will not, however, be conferred simply on the ground of the completion of the prescribed study. Special high attainments are requisite; particularly the power of original thought and independent investigation. Two-thirds of the study must be devoted to some one subject or closely allied group of subjects, and a thesis must be presented which shall exhibit original research and independent treatment. The applicant should announce himself as a candidate at least as early as the beginning of his last year of study, and his thesis should be placed in the hands of the appropriate Committee of the Faculty at least two months before the close of the academic year.

HONORS IN SPECIAL STUDIES.

Special honors are given at graduation for special work of a high order of excellence obtained in any department. An acceptable thesis is required. The work for a special honor must equal in amount a full study for one term; and in the case of those branches in which there are longer and shorter elective courses, the student must have taken the longer course. Candidates for special honors must have a general average standing of eighty-eight, and of ninety-three in the department in which the application is made.

Students taking special honors read their theses in public on the Monday preceding Commencement Day.

Application for special honors must be made to the Faculty through the professor in whose department the honors are sought at the opening of the winter term. The application must be accompanied with a statement of the subject of the proposed thesis. Either the theses or abstracts of the theses must be submitted at the opening of the spring term; and in any case the theses must be submitted at least two weeks before the Monday preceding Commencement to a committee consisting of the professor in whose department honors are sought, and the committee on higher degrees in the course to which the students belongs.

FELLOWSHIPS.

THE JOHN JOHNSTON FELLOWSHIP.

The Hon. John Johnston, of Milwaukee, has generously established a fellowship on a financial basis of $400 per annum for two years. In the nomination of candidates for this fellowship preference will be given,

other things being equal, to excellence and promise in the department of Mechanic Arts, and to residents of Milwaukee County, but the appointments will not necessarily be restricted to those fulfilling these conditions.

UNIVERSITY FELLOWSHIPS.

For the purpose of promoting higher scholarship and more extended original study than the academic courses afford, the Board of Regents has recently established eight University Fellowships of $400 each, conditioned upon proper qualifications and upon a prescribed amount of service rendered in instruction in the University. Candidates for these fellowships are nominated by the President and Faculty, and elected by the Board of Regents. The fellowships continue for one year only, unless at the end of that time the holder of a fellowship be elected for a second year. The appointees will be selected from those members of the graduating class of each year who have been in attendance upon the regular college courses during the preceding two years, except that by the unanimous recommendation of the Faculty, graduates not conforming to this condition may be elected. Any vacancies which may occur in any of the fellowships for any cause, may be filled by the appointment of any graduate of the University. The nominations will be confined to such graduates as are of a high moral character, good habits, distinguished scholarship, and who give promise of future success, and are qualified by previous study and marked abilty to pursue the studies which they may elect as fellows in the University and to perform the services required of them. Each candidate must teach such branches as may be assigned to him by the President to the extent of one hour daily during the scholastic year, or supervise laboratory work two hours a day.

SCHOLARSHIPS.

THE JOHN A. JOHNSON SCHOLARSHIPS.

The University is indebted to the liberality of Hon. John A. Johnson, of Madison, for ten scholarships of about $35 annual value each, established under the following conditions:

The sum received by one student in one year shall not exceed $50, nor the sum received during his college course exceed $200. Until the year 1900 the sum will be limited to students speaking one of the Scandinavian languages (Norse, Swedish, Danish or Icelandic). No student can receive aid from this fund unless he has attended a common school one year, or has attended the University one year. The recipient of aid will be expected to return the money received by him to the fund, if he shall at any time be able to do so. The income of the fund will be dispensed

by a committee of the Faculty. This committee consists of President Chamberlin and Professors Olson and Bull.

THE JOHN JOHNSTON SCHOLARSHIP.

Hon. John Johnston, of Milwaukee, has generously offered a scholarship of $250 per annum for a period of four years, to be awarded to a student of limited pecuniary resources, resident of Milwaukee County; said scholarship to be awarded to the student applying for admission to the University who has passed the best accredited examination, and upon other conditions to be determined by the two regents residing in or nearest to Milwaukee County and the principal of the Milwaukee High School, with the approval of Mr. Johnston.

UNIVERSITY EXTENSION.

For a number of years the leading English universities have been endeavoring to extend the benefits of university instruction to the people in various parts of the kingdom through courses of lectures accompanied by class work, special studies and examinations. The movement was at first of slow growth but at length took strong hold upon the more progressive classes and has become one of the most important departures in university effort. Last year more than forty thousand students were enrolled as regular attendants upon the courses offered. The effort is known as University Extension.

Quite independently of this, an analogous movement in popular education, though in a much more specialized field, was started in Wisconsin six years ago by the enactment of a law establishing agricultural institutes and making a generous appropriation for their maintenance. Details respecting these will be found on a subsequent page in connection with the College of Agriculture. The attendance upon these institutes, and their success in awakening thought, has closely approximated that of the English system. There is a radical difference between the two, however, in the fact that the English instruction lies chiefly in literary, historical and scientific lines and is essentially cultural, while the Wisconsin effort has been essentially industrial. It is obvious that the two systems are complements of each other and that their union is necessary to a complete system.

Some tentative efforts in the direction of literary and scientific popular instruction have been made by the University with a view to proving the ground preliminary to a more formal effort. More extensive endeavors have been made at the east with such success as to warrant more systematic efforts.

By recent action of the Regents and the Faculty of the University the English University Extension system has been formally adopted and

steps will be taken for carrying it into effect at the opening of the coming year. The plan adopted will be essentially that which has proved successful in connection with the English Universities.

By a similar action of the Regents and Faculty, the American correspondence system of promoting advanced private study has been adopted and will be definitely formulated at the opening of the coming year. The correspondence system is inferior to the lecture and class system in that it lacks the personal supervision and inspiration which are so important factors in the best education, but it has the compensating merit of being adapted to a sparse population and to special students who cannot gather themselves into classes or audiences to receive lectures and personal instruction.

The scheme thus adopted is exceptionally comprehensive, embracing a combination of all the leading lines of effort which have proved successful in extending to the people a portion of the benefits of university education.

COLLEGE OF LETTERS AND SCIENCE.

FACULTY.

The President of the University.

J. B. PARKINSON, Professor of Civil Polity and Political Economy.

ALEXANDER KERR, Professor of Greek Language and Literature.

J. W. STEARNS, Professor of Philosophy and Pedagogy.

J. E. DAVIES, Professor of Physics.

W. W. DANIELLS, Professor of Chemistry.

W. H. ROSENTENGEL, Professor of German Language and Literature.

J. C. FREEMAN, Professor of English Literature.

F. A. PARKER, Professor of Music.

D. B. FRANKENBURGER, Professor of Rhetoric and Oratory.

E. T. OWEN, Professor of French Language and Literature.

E. A. BIRGE, Professor of Zoology.

C. A. VAN VELZER, Professor of Mathematics.

W. H. WILLIAMS, Assistant Professor of Hebrew and Sanskrit.

C. R. BARNES, Professor of Botany.

G. C. COMSTOCK, Professor of Astronomy.

C. R. VAN HISE, Professor of Archean and Applied Geology.

JOSEPH JASTROW, Professor of Psychology.

C. E. BENNETT, Professor of Latin.

J. E. OLSON, Assistant Professor of Scandinavian Languages and Literature.

ALMAH J. FRISBY, Preceptress and Professor of Hygiene and Sanitary Science.

J. A. COLE, Professor of Military Science and Tactics.

H. W. HILLYER, Assistant Professor of Chemistry.

L. M. HOSKINS, Assistant Professor of Pure and Applied Mechanics.

C. S. SLICHTER, Assistant Professor of Mathematics.

F. J. TURNER, Assistant Professor of History.

W. H. HOBBS, Curator of Geological Museum and Assistant in Mineralogy and Metallurgy.

SUSAN A. STERLING, Instructor in German.

GRACE CLARK, Instructor in French.

FLORENCE CORNELIUS, Instructor in Latin.

A. S. FLINT, Assistant Astronomer.
LUCY MARIA GAY, Instructor in French.
C. H. HASKINS, Instructor in History.
A. A. KNOWLTON, Instructor in Rhetoric.
H. B. LOOMIS, Instructor in Physics.
A. E. PALMER, Instructor in Elocution.
J. M. PARKINSON, Instructor in Elementary Law.
W. G. SIRED, Instructor in Music.
G. H. STEMPEL, Instructor in German.

ADMISSION.

There are three methods of admission to the University:

I. By examination at the University.
II. By special local examinations under the supervision of an authorized agent of the University, and
III. By certificates from accredited schools.

EXAMINATIONS AT THE UNIVERSITY.

The regular examinations of the University are two in number; one in June and one in September. The earlier one is intended for those who wish to be examined while fresh from their preparatory studies and thus to set at rest all doubt as to their admission; and for those who wish to test their qualifications at an early date that they may have time to make up deficiencies if necessary. The September examination immedately precedes the opening of the fall term.

For the current year the earlier examination will be held on Thursday and Friday, June 11th and 12th, beginning at 9 o'clock A. M. The later examination will be held on Tuesday and Wednesday, September 9th and 10th, beginning at 9 o'clock A. M. Students who are in any doubt as to their qualifications are urged to present themselves at the earlier examination.

Examinations will also be held on the opening day of the winter and the spring terms.

SPECIAL LOCAL EXAMINATIONS.

To save expense and embarrassment to those who live at a considerable distance from the University, special local examinations will be given when satisfactory arrangements can be made. Upon request,

questions will be sent to any principal or county superintendent who will consent to supervise the examination for the accommodation of the candidate. The questions are to be submitted under the usual restrictions of a written examination, and the answers returned to the University accompanied by the endorsement of the principal or superintendent that the examination has been properly made. To the thoughtful candidate there is no temptation to return other than perfectly fair and honest answers, since admission upon a false basis will only lead to future embarrassment. A fair test of fitness is as important to the student as to the University. The only requirement made of the principal or superintendent is that he consent to receive the questions, to see that the examination is properly carried out and to return the questions with the endorsement indicated. It will be left with the student desiring to take advantage of this provision to secure the consent of the proper party to take charge of the examination, and to make request to the President of the University to have the questions sent. The proper time for such an examination is that of the earlier examination of the University in June or earlier. Exceptions may be made for special reasons. It is very desirable, however, that all papers should be returned to the University before Commencement, as the professors in charge of examinations usually separate immediately thereafter.

TERMS OF ADMISSION TO THE COLLEGE OF LETTERS AND SCIENCE.

ANCIENT CLASSICAL COURSE.

English Grammar, including sentential analysis and orthography, political and physical geography, arithmetic, algebra through quadratics, plane geometry, U. S. history, ancient history (Myers' Outlines or its equivalent), history of England (Gardiner's History of England or its equivalent), Latin grammar (an amount equivalent to that embraced in the two largest sizes of type in Allen and Greenough's grammar), Latin composition (40 lessons as given in standard works), Cæsar, four books; Cicero, seven orations, including that for the Manilian Law, (in the fall of 1891 Sallust's Catiline, as hitherto required, may be offered instead of the Manilian Law); Virgil, six books of the Æneid; Greek grammar, Greek composition, as given in standard elementary works, Xenophon, three books of the Anabasis; Homer, two books of the Iliad.

(For requirements in 1892–3, see page 69.)

MODERN CLASSICAL COURSE.

English grammar, including sentential analysis and orthography, political and physical geography, arithmetic, algebra through quadratics, plane and solid (including spherical) geometry, U. S. history, ancient history (Myers' Outlines or its equivalent), history of England (Gardiner's or its equivalent), Latin grammar (an amount equivalent to that embraced in the two largest sizes of type in Allen and Greenough's grammar), Latin composition (40 lessons as given in standard works), Cæsar, four books; Cicero, seven orations, including that for the Manilian Law, (in the fall of 1891 Sallust's Catiline, as hitherto required, may be offered instead of the Manilian Law); Virgil, six books of the Æneid; German grammar and twenty lessons in any standard German reader.

(For requirements in 1892–3, see page 70.)

GENERAL SCIENCE COURSE.

English grammer, including sentenial analysis and orthography, political and physical geography, arithmetic, algebra through quadratics, plane and solid (including spherical) geometry, history of the United States, natural philosophy, physiology, botany, German grammar, and twenty lessons in any standard reader.

(For requirements in 1892–3, see page 70.)

ENGLISH COURSE.

English grammar, including sentenial analysis and orthography, political and physical geography, arithmetic, algebra through quadratics, plane and solid (including spherical) geometry, history of the United States ancient history (Myers' Outlines or equivalent), English history (Gardiner's work or its equivalent), botany, physiology and natural philosophy, English literature (Meiklejohn's English Literature or Stopford Brooke's Primer of English Literature and Swinton's Masterpieces of English literature or their equivalents).

(For requirements in 1892–3, see page 71.)

CIVIC–HISTORICAL COURSE ANTECEDENT TO LAW AND JOURNALISM.

The requirements for admission to this course are the same as for either of the classical courses or the English Course, according to the special form the candidate desires to take.

SPECIAL SCIENCE COURSE ANTECEDENT TO MEDICINE.

The requirements are the same as for the General Science Course.

ELEMENTARY GREEK CLASS.

For the accommodation of those who desire to take the Ancient Classical Course, but who have been unable to secure preparation in Greek, an elementary Greek class is provided, for admission to which Greek is not required. In Latin, four books of Cæsar, four orations of Cicero (in the fall of 1891 two orations of Cicero and Sallust's Catiline, as hitherto required, may be offered). Otherwise the requirements are the same as for the Ancient Classical Course.

(For requirements in 1892–3, see page 72.)

SPECIAL STUDENTS.

Candidates who do not desire to graduate, or who wish to select their studies, and those who wish ultimately to obtain a standing in some regular course, to which their preparation is ill adjusted, are permitted to take special courses. Such students may enter at any time and take any studies which they are prepared to prosecute to advantage. For admission, the following studies are required: English grammar, including sentential analysis and orthography, arithmetic, algebra through quadratics, political and physical geography, history of the United States, plane and solid (including spherical) geometry, physiology, botany and natural philosophy.

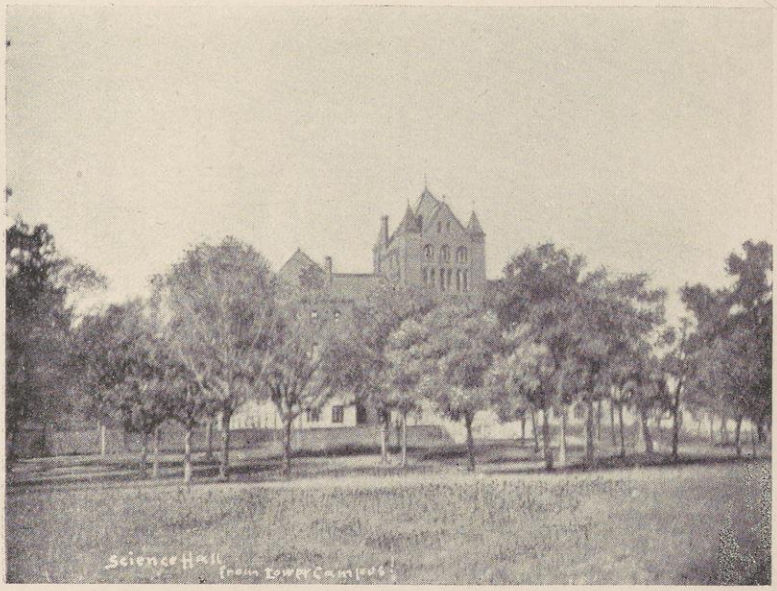
(For requirements in 1892–3, see page 72).

EQUIVALENTS AND CONDITIONS.

The entrance examinations are not designed as an artificial barrier to entrance, but simply as a necessary means of determining, in the interest of the candidates, as well as of the University, whether they are prepared to pursue profitably the courses offered. The variety of courses is such that few can fail to find admission on account of ill-adjustment of previous study, if they really possess intellectual attainments which fairly rank them with University students.

Real equivalents will be taken for any of the above requirements. There are, however, two classes of equivalents which the student contemplating admission should carefully distinguish. Equal amounts of study in different branches may be equivalents in the general sense of representing equal acquirements, while they may be far from equivalents in the sense of being *substitutes* for each other in a given course of study. It is the policy of the University to accept equivalents in the broader sense of the term, so far as simple admission to the University is concerned, but such equivalents cannot always be accepted as substitutes for other studies in admission to given courses. Certain studies are a necessary preparation for other studies in a given course and no other


View on Park street


Science Hall
from Lower Campus

preparation can be accepted. Conditions will be restricted to such special cases as in the judgment of the examiners seem to justify departure from the stated requirements, chiefly those in which the candidates are mature and naturally strong and are incompletely prepared merely from lack of opportunity. Students from schools which furnish adequate facilities for preparation cannot expect to gain by coming to the University before their preparation is complete; on the contrary, they are liable to endanger their future success by attempting to enter prematurely.

REQUIREMENTS FOR ADMISSION FOR THE YEAR 1892–3.

Beginning with the academic year 1892–3, it is proposed to increase the requirements for admission to the several courses of the University in different degrees so as to bring the preparation for all of the courses up to an essential equality. It is also proposed to bring the University into more formal and official relationship with the state school system. To do this the four high-school courses recently revised and recommended by the State Superintendent have been adopted as standards or types of the preparatory work required for admission to the corresponding courses of the University. In the revision of the high-school courses this prospective relationship was contemplated and an effort was made to make the courses combine as large a degree as practicable of adaptation to the wants of both those who do and those who do not contemplate a University course. The rest of the adaptation is accomplished by concessions. In the classical courses recommended, preparation for a University course largely controls the selection and arrangement of studies, while in the science and English courses the interests of those who do not contemplate a University course are dominant. All of the courses occupy four years, and starting with a common lower horizon should give nearly equivalent results in degree, though different in kind.

In addition to prescribing the subjects to be taken and the ground to be passed over, it is proposed to take into consideration the *time* devoted to each subject, as this is one of the criteria of a good preparation.

FOR THE ANCIENT CLASSICAL COURSE IN 1892–3.

The recommended Ancient Classical preparatory course (four years), embraces Latin, three years and two terms; Greek, two years; algebra, one year; plane geometry, two terms; ancient history, one term; English history, two terms; United States history, two terms; physical geography, two terms, with two terms' work devoted to elective subjects, and one term each to a review and advanced study of grammar and geography and one year to a review and advanced study of arithmetic. Solid

geometry is recommended as one of the elective subjects. In Latin, a thorough knowledge of grammar and 40 lessons of prose composition as given in standard works, four books of Cæsar, seven orations of Cicero and six books of Vergil will be required. In Greek, a thorough knowledge of the grammar and Greek prose composition, as given in standard elementary works, four books of Xenophon's Anabasis and three books of Homer's Iliad will be required. The subjects in Algebra named below, under General Science Course, will be required.

FOR THE MODERN CLASSICAL COURSE IN 1892-3.

The same as above except that German will be substituted for Greek, and solid geometry will be required. In German, a thorough knowledge of the grammar and of any standard German reader will be required.

FOR THE GENERAL SCIENCE AND ENGINEERING COURSES IN 1892-3.

The recommended preparatory course (four years) in science embraces one year devoted to advanced grammar, including sentential analysis, one year to advanced geography (physical geography two terms), one year to advanced arithmetic (all should be through-going *advanced* work, not the mere finishing up of incomplete grammar-school work, a sound preparation in these fundamental studies being especially requisite in the Science and Engineering courses); one year of algebra, including the fundamental operations, fractions, factoring, simple equations, simultaneous equations, theory of exponents (integral, fractional, negative and zero), radicals, ratio and proportion, and quadratic equations; geometry (plane, solid and spherical), one year; physics, one year (laboratory work recommended); physiology, two terms; botany, two terms; German or French, two years (a thorough knowledge of grammar and of any standard reader).

Besides the above prescribed studies, five additional subjects occupying six terms are named in the Superintendent's course, (viz.: Civil government, rhetoric, mental science, the constitution of the United States and of Wisconsin and theory and art of teaching, the last two prescribed by state law). These specific subjects will not be required (though they will be accepted, if offered), but equivalent work to the amount of six terms of twelve weeks or more each, aggregating at least seventy-five weeks (eighty weeks being the standard), will be required. The special studies will be left to the selection of the high school (or the candidate) and are intended to afford the means for adapting the high schools to local demands and the requirements of state law. For convenience they will be termed adaptive studies. By a term's work is meant one study pursued daily throughout twelve or more weeks, two other regular

studies only being taken. Where three other regular studies are taken a corresponding extension of the time is expected. In schools in which the year is divided into two terms, four studies of twenty weeks each will fulfill the requirements. A single study pursued two or more terms counts the same as different studies pursued the same time and is preferable. The whole six terms may most wisely be devoted to some important subject, as a language, history, literature, chemistry or zoology. No study to which less than twelve weeks has been given will be acceptable. Candidates in all those high schools in which both the English and scientific courses are maintained are recommended to take one year of ancient and English history and one year of English literature to make up the six terms required.

The length of time devoted to a subject is of doubtful value as a criterion in the case of candidates who do not come from accredited schools, as the character of their instruction has not been under inspection. Such candidates will be expected to offer studies equivalent to six terms (or seventy-five weeks) work, the equivalency to be shown by the character of the candidate's examination in them. How much any study offered will be allowed to count will be determined by the nature of the candidate's mastery of it. Such candidates may offer any subjects of high school or collegiate grade not prescribed above, but history, French, Latin, English literature, zoology, chemistry, geology and astronomy are preferable.

FOR THE ENGLISH COURSE IN 1892-3.

The same as for the Science Course except that one year of history (Ancient and English) and one year of English literature are prescribed instead of German. In those high schools in which the scientific preparatory course is also given, the two years' course in German is recommended instead of the six terms of adaptive work given in the Superintendent's course.

The attention of the principals of village schools, and of students living in the villages and in the country, is invited to the three years' course recommended by the State Superintendent, which is practically identical with the first three years of the preparatory English and scientific courses. It is recommended that this course, or its practical equivalent, be adopted in those villages in which a longer course cannot be efficiently maintained. Students who have finished this three years' course can then enter an accredited school having the prescribed four years' course and in one year prepare for the University.

The general adoption of the four-years' courses or their equivalents by the city high schools, and of the three-years course by the village high schools and the development of the country schools so that they shall

prepare adequately for these high school courses, will bring the whole state system into admirable co-ordination without seriously sacrificing the interests of any part of it.

THE ELEMENTARY GREEK CLASS.

As Greek is given in but few high schools, a special concession is made to those who wish to take the Ancient Classical Course in the University. An Elementary Greek Class is provided for admission to which Greek will not be required. In Latin, four books of Cæsar and four orations of Cicero will be required. Otherwise the requirements will be the same as for the Ancient Classical course. This preparation may be secured by taking the Modern Classical Course recommended by the State Superintendent through the first three years, substituting geometry in the place of German in the third year. Students who thus take their elementary Greek in the University must expect to take five years for completing the Ancient Classical Course.

SPECIAL STUDENTS.

Beginning with the academic year 1892–3, candidates under twenty years of age desiring to take special courses will be required to present the same qualifications as candidates for the regular courses.

Candidates over twenty years of age, who are not candidates for a degree, and who wish to take special studies, will be permitted to do so upon giving satisfactory evidence that they are prepared to take the desired studies advantageously. If they subsequently desire to become candidates for a degree, or to take a regular course, they must pass the required entrance examinations.

ADMISSION UPON ACCREDITED CERTIFICATES.

Accredited Schools.— Any high school or academy whose course of instruction covers the branches requisite for admission to one or more of the courses of the University, may be admitted to its accredited list of preparatory schools after a satisfactory examination by a representative of the University. Application for such an examination may be made by any officer of the school to the President of the University, on the basis of which a representative of the University will examine the course of study and the methods of instruction of the school and on his favorable recommendation, and the concurrence of the Faculty, it will be entered upon the accredited list of the University. The *graduates* of such an approved school will be received by the University, without examination, into any of its courses for which they have been fitted. Students of an accredited school who are not graduates, but who have completed the required preparatory studies, may be admitted on the

special recommendation of the principal. Students of an accredited school who are not graduates, and who are not specially recommended for admission by the principal, must expect examination as other candidates.

A school once entered upon the accredited list will remain there until its administration is changed, or until notice is given by the University of unsatisfactory results. Upon a change of administration, application for continuation upon the list, if desired, should be made. If the work of the principal coming into charge has been recently examined in connection with some other school, a new examination may not be required, but such examination should in all cases be invited. The necessary expenses attending the visit of the representative of the University are to be met by the school under examination.

The University greatly desires a close working relationship with the schools of the State, and is gratified with the results of this system as thus far realized.

ACCREDITED HIGH SCHOOLS.

FOR ALL COURSES.

Beloit High School,	W. S. Axtell, Principal.
Berlin High School,	A. J. Rote, Principal.
Chicago (Ill.)High School,	Geo. Howland, Superintendent.
Fond du Lac High School,	I. N. Mitchell, Principal.
Janesville High School,	F. W. Cooley, Principal.
La Crosse High School,	Albert Hardy, Principal.
Louisville (Ky.) Male High School,	Maurice Kirby, Principal.
Madison High School,	E. J. McEwan, Principal.
Milwaukee High School,	G. W. Peckham, Principal.
Monroe High School,	J. A. Mitchell, Principal.
Rockford (Ill.) High School,	Walter A. Edwards, Principal.

FOR ANCIENT CLASSICAL, GENERAL SCIENCE, ENGLISH, ENGINEERING AND AGRICULTURAL COURSES.

Oshkosh High School	R. H. Halsey, Principal.

FOR MODERN CLASSICAL, GENERAL SCIENCE, ENGLISH, ENGINEERING AND AGRICULTURAL COURSES.

Baraboo High School,	L. H. Clark, Principal.
Black River Falls High School,	Dwight Kinney, Principal.
Burlington High School,	C. W. Rittenberg, Principal.
Darlington High School,	Geo. E. Cabanis, Principal.

De Pere High School,	F. W. Buchholtz, Principal.
Dodgeville High School,	L. L. Clarke, Principal.
Eau Claire High School,	M. S. Frawley, Principal.
Elkhorn High School,	J. T. Edwards, Principal.
Freeport (Ill.) High School,	Miss Francis A. Rosebrugh, Princip'l
Lancaster High School,	C. R. Showalter, Principal.
Mayville High School,	L. S. Kelley, Principal.
Necedah High School,	Wm. F. Sell, Principal.
Neillsville High School,	E. B. Oakley, Principal.
Prairie du Chien High School	F. G. Kraege, Principal.
Sheboygan High School,	J. E. Riordan, Principal.
Whitewater High School,	C. H. Sylvester, Principal.

FOR MODERN CLASSICAL, GENERAL SCIENCE, ENGINEERING AND AGRICULTURAL COURSES.

Appleton High School,	O. H. Ecke, Principal.
Beaver Dam High School,	H. B. Hubbell, Principal.
Delavan High School,	J. H. Hutchinson, Principal.
Evansville High School,	L. E. Gettle, Principal.
Fort Atkinson High School,	D. D. Mayne, Principal.
Green Bay High School,	Jno. A. Hancock, Principal.
Lake Geneva High School,	J. H. Gould, Principal.
Neenah High School,	C. W. Cabeen, Principal.
Prescott High School,	J. Goldsworthy, Principal.
Racine High School,	A. J. Volland, Principal.
Sparta High School,	J. W. Livingston, Principal.
Stevens Point High School,	H. A. Simonds, Principal.
Tomah High School,	G. W. Reigle, Principal.
Viroqua High School,	J. H. Martin, Principal.
West De Pere High School,	Chas. Mains, Principal.
Watertown High School,	C. F. Viebahn, Principal.

FOR GENERAL SCIENCE, ENGLISH, ENGINEERING AND AGRICULTURAL COURSES.

Ashland High School,	J. M. Turner, Principal.
Boscobel High School,	J. A. Tormey, Principal.
Columbus High School,	L. M. Roberts, Principal.
Edgerton High School,	P. M. Jack, Principal.
Grand Rapids High School,	W. H. Luehr, Principal.
Horicon High School,	J. H. Derse, Principal.
Hudson High School,	A. E. Schaub, Principal.
Kenosha High School,	Frank Clary, Principal.
Lodi High School,	O. J. Schuster, Principal.
Menominee High School,	R. B. Dudgeon, Principal.
New London High School,	H. A. Weld, Principal.

New Richmond High School, -	W. H. WILLIAMS, Principal.
Oregon High School, - -	ARTHUR SHOLTZ, Principal.
Ripon High School, - -	M. H. MCMAHON, Principal.
Waupaca High School, - -	F. A. LOWELL, Principal.
Wausau High School, - -	J. A. EAKIN, Principal.
West Bend High School, - -	D. T. KEELY, Principal.

FOR GENERAL SCIENCE, ENGINEERING AND AGRICULTURAL COURSES.

Brodhead High School, - -	F. E. MCGOVERN, Principal.
Mineral Point High School, -	A. R. JOLLEY, Principal.
Portage High School, - -	W. G. CLOUGH, Principal.
Poynette High School, -	JAMES MELVILLE, Principal.
Reedsburg High School, - -	A. B. WEST, Principal.
Waterloo High School, -	W. J. HOSKINS, Principal.

FOR ENGLISH COURSE.

Chippewa Falls High School, -	GEO. S. PARKER, Principal.
Elroy High School, - -	J. R. SLONAKER, Principal.
Jefferson High School, - -	J. G. ADAMS, Principal.
Kewaunee High School, -	M. MCMAHON, Principal.
Lake Mills High School, - -	H. L. TERRY, Principal.
Marshall High School, -	W. A. HODGE, Principal.
Mauston High School, - -	W. L. MORRISON, Principal.
Mazomanie High School, -	R. F. SKIFF, Principal.
Omro High School, - -	FRANK T. TUCKER, Principal.
Richland Center High School,	T. H. HANEY, Principal.
Sharon High School, - -	J. G. SKEELS, Principal.
Spring Green High School, -	W. A. CUNDY, Principal.
Stoughton High School, - -	C. F. CRONK, Principal.
Wauwatosa High School, -	A. W. SMITH, Principal.

ACCREDITED ACADEMIES AND OTHER INSTITUTIONS.

Albion Academy, - - -	D. E. WILLARD, Principal.
Carroll College (Waukesha), -	W. L. RANKIN, Principal.
Evansville Seminary, - -	J. E. COLEMAN, Principal.
Harvard School (2101 Indiana Ave., Chicago, Ill.), - -	J. J. SCHOBINGER and J. C. GRANT, Principals.
Hillside Home School, - -	MISS ELLEN C. LLOYD-JONES and MISS JANE LLOYD-JONES, Principals.

Kenwood Institute (5001 Lake Ave., Chicago, Ill.), - -	MRS. HELEN EKIN STARRETT and MISS ANNIE E. BUTTS, Principals.
Milwaukee Academy, - -	ISAAC THOMAS and JULIUS H. PRATT, Principals.
Racine Academy, - -	W. W. ROWLANDS, Principal.
Wayland Academy (Beaver Dam),	JAMES P. THOMS, Principal.
Wisconsin Academy (Madison), -	W. M. POND, Principal.

FITTING SCHOOLS.—The University having examined, through its representatives, the above schools, and having, in most cases, tested their work by their products, recommends them as suitable fitting schools for the University.

GRADUATES OF THE STATE NORMAL SCHOOLS.

Duly accredited graduates of the advanced course of the State Normal Schools will hereafter be admitted to the University with the rank of Juniors in the English and General Science Courses. A special adaptation of these courses has been framed for the purpose of enabling such graduates to utilize as advantageously as practicable their previous training. This has been done in view of the ill-adjustment of the courses of Normal Schools to the regular college courses, and in recognition of the excellent training given in the Wisconsin Normal Schools.

These courses are presented on a subsequent page, and the attention of Normal School graduates is invited to them.

The certified standing of any student in the regular courses of the Normal Schools of this state will be accepted in the studies which it covers, in place of an examination.

STUDENTS FROM OTHER COLLEGES AND UNIVERSITIES.

Students from other institutions, who have pursued standard college courses equivalent to those of the University, will be admitted to a like standing upon the presentation of proper certificates of creditable standing and honorable dismission. Students of other colleges of good standing who have not taken such standard courses, but who have studied one year in the college proper, may be admitted to the University as special students without examination, or, upon such an examination as may be necessary to determine their attainments, they may be admitted to any course or to any class for which they are found fitted. Students coming from other institutions are advised to bring authenticated records of their standing. In all cases of reasonable ground for doubt, the University reserves the right to test the value of such records by actual examination.

GRADUATE STUDENTS.

Graduates of this University and of other colleges and universities of good standing are admitted to graduate courses without examination.

DIPLOMAS AS STATE CERTIFICATES.

Attention is invited to the following laws of the state giving to graduates of the University the privilege of converting their diplomas into state certificates:

Section 387 (Rev. Stat.) * * After any person has graduated at the State University, and, after such graduation has successfully taught a public school in the state for sixteen school months, the Superintendent of Public Instruction shall have authority to countersign the diploma of such teacher, after such examination as to moral character, learning and ability to teach, as to the said superintendent may seem proper and reasonable. Any person holding a diploma granted by the Board of Regents of the State University, certifying that the person holding the same is a graduate of the State University, shall, after his diploma has been countersigned by the State Superintendent of Public Instruction as aforesaid, be deemed qualified to teach any of the public schools of this state, and such diploma shall be a certificate of such qualification until annulled by the Superintendent of Public Instruction.

Chapter 376, Laws of 1887. Section 1. Whenever the diploma of any graduate of the University of Wisconsin shall, by the signature or endorsement of the professor of science and art of teaching in that institution, evidence that the person therein named has completed the full course in pedagogy provided for at the university, and such person shall have taught a public school in this State successfully for eight months after receiving such diploma, the state superintendent may countersign the diploma thus beld, after such examination as to moral character, learning and ability to teach, as to the said superintendent may seem proper and reasonable, and such diploma, when countersigned, shall be a certificate of qualification to teach in any public school of this state, until annulled by the state superintendent.

GRADUATE DEPARTMENT.

The University now affords excellent facilities for graduates of colleges and universities to pursue advanced and original work. No formal courses are prescribed, but special lines of study or of investigation will be arranged to meet individual desires so far as the facilities of the institution permit. The diploma of any college or university of good standing will secure admission without examination, and no charges, except those made to under-graduate students, will be imposed. The recent establishment of nine University Fellowships will insure the constant presence of a select body of graduate students, who will furnish companionship in work and the advantages of mutual stimulus and aid in research.

UNDERGRADUATE DEPARTMENT.

COURSES OF STUDY.

RULES FOR ELECTIONS.

I. Each student must have at least three daily exercises; an additional exercises may be taken when the standing of the student is eighty-six or upwards.

II. No election can be changed after two weeks of the term have passed.

III. Elections must be conformed to the time table.

IV. The required studies of any course will ordinarily be taken in the year to which they are assigned by the table of studies. Elective studies are announced in the course and year in which they are usually elected. They may, however, be elected by students of other years and courses; and any study of the University, of whatever course, is open to any student who is qualified to take it, and can profit by it.

V. If fewer than six persons present themselves for any elective course, the formation of the class will be left to the discretion of the President and professor in charge.

VI. Special students are held to the same requirements, in regard to any study which they elect, as regular students in the same study, unless special arrangement is made with the professor in charge of the department.

VII. Students are directed to consult their class-officers in electing their studies.

GENERAL LIST OF STUDIES.

"Full study" signifies five recitations or equivalent exercises a week; "three-fifths study," three exercises a week, etc. Fuller information will be found by referring to the descriptions of the subcourses (indicated by the Roman numerals), which are given later under the head of Subcourses.

FALL TERM.

PHILOSOPHY —

I. General Psychology, full study, Prof. Stearns and Prof. Jastrow.
VI. History of Greek Philosophy, two-fifths study, Prof. Jastrow.

PEDAGOGY —

I. History of Educational Theories and Practices, full study, Prof. Stearns.

CIVICS —

I. Elementary Law, full study, Prof. Parkinson.
IV. American Constitutional Law, two-fifths study, Prof. Parkinson.
X. Political Economy, full study, Prof. Parkinson.

HISTORY —

I. Dynastic and Territorial History, three-fifths study, Dr. Haskins.
II. English History, two-fifths study, Dr. Haskins.
IV. General History, three-fifths study, Dr. Haskins.
V. Nineteenth Century, three-fifths study, Prof. Turner.
VI. Constitutional and Political History United States, full study, Prof. Turner.
VII. History of Institutions, three-fifths study, Dr. Haskins.
VIII. History of Society, two-fifths study, Prof. Turner.
IX. English Constitutional History, two-fifths study, Dr. Haskins.
XI. Seminary, two-fifths study, Prof. Turner and Dr. Haskins.

GREEK —

I. Elementary Greek Grammar and Composition, full study, Prof. Kerr.
II. Xenophon's Anabasis, speaking and writing Greek, full study, Prof. Williams.
III. Lysias, full study, Prof. Kerr.
V. Herodotus, two-fifths study, Prof. Kerr.
VI. Demosthenes' Olynthiacs, three-fifths study, Prof. Williams.
VII. Plato's Apology and Crito, two-fifths study, Prof. Kerr.
IX. New Testament Greek, two-fifths study, Prof. Williams.
X. Greek Seminary, one-fifth study, Prof. Kerr.

LATIN —

I. Cicero's Orations, full study, Miss Cornelius.
II. Livy, full study, Miss Cornelius.
III. Livy, full study, Prof. Bennett.
IV. Horace's Odes, two-fifths study, Prof. Bennett.
V. Horace's Odes and Plautus' Mostellaria, full study.

VII. Lucretius, three-fifths study, Prof. Bennett.
VIII. Latin Seminary, Text Criticism of Tacitus' Dialogus de Oratoribus, two-fifths study, Prof. Bennett.
IX. Latin Philology, two-fifths study, Prof. Bennett.

SANSKRIT—

I. Elementary, two-fifths study, Prof. Williams.
II. Advanced, two-fifths study, Prof. Williams.

HEBREW—

I. Grammar, Genesis i-viii two-fifths, study, Prof. Williams.
II. Advanced, Samuel, Isaiah, Psalms, two-fifths study, Prof. Williams.
III. Advanced, Hebrew Syntax, one-fifth study, Prof. Williams.

FRENCH—

I. Otto's French Conversation Grammar, Le Roman d'un Jeune Homme Pauvre, full study, Miss Gay.
II. A modification of (I), for Latin students, with the addition of the history of the French language, full study, Miss Gay.
III. A modification of (I), for Scientific, Engineering and English students, full study, Miss Gay.
IV. { Writing French and Cinq Mars, three-fifths study. Prof. Owen.
{ Conversation in French, extra exercise, one hour a week, Miss Gay.
V. { Oral French and Ursule Mirouet, two-fifths study, Prof. Owen.
{ Conversation in French, extra exercise, one hour a week, Prof. Owen.

ITALIAN—

I. Conversation Grammar and Manzoni's I Promessi Sposi, half study Prof. Owen. (Given in 1890-91.)

SPANISH—

I. Conversation Grammar and Castelar's Historia del año 1883, half study, Prof. Owen. (Given in 1891-92.)

GERMAN—

I. Reader, full study, Mr. Stempel.
II. Reader of German Literature, three-fifths study, Prof. Rosenstengel.
III. Wilhelm Tell, two-fifths study, Prof. Rosenstengel.
IV. Maria Stuart, three-fifths study, Prof. Rosenstengel.
V. Grammar, full study, Prof. Olson.
VI. Reader, full study, Prof. Rosenstengel.
VII. Reader, full study, Miss Sterling.
VIII. Die Bakterien, two-fifths study, Miss Sterling.
IX. Heine's Prosa, three-fifths study, Miss Sterling.
X. Grammar and Reader, full study, Mr. Stempel.
XI. German Composition, three-fifths study, Prof. Rosenstengel.

NORSE—

I. Modern Elementary, Grammar and Reader, Selections from Norse folk-lore stories, full study, Prof. Olson.
II. Modern Advanced, Kielland's Skipper Worse, full study, Prof. Olson.
III. General Survey, three-fifths study, Prof. Olson.
IV. Old Norse or Icelandic, two-fifths study, Prof. Olson.

ENGLISH—

II. Advanced Anglo-Saxon, two-fifths study, Prof. Freeman.
V. English Literature, General Survey, three-fifths study, Prof. Freeman.
X. Preliminary Shakespeare Course, two-fifths study, Prof. Freeman.

RHETORIC AND ORATORY—

I. Rhetoric, Genung's "Practical Rhetoric," full study, Prof. Frankenburger.

II. Rhetoric, Genung's "Practical Rhetoric," two-fifths study, Mr. Knowlton.

III. Philosophy of Rhetoric, D. J. Hill's "Science of Rhetoric," three-fifths study, Prof. Frankenburger.

VI. Elocution, Macbeth and Othello, with lectures, two-fifths study, Prof. Frankenburger.

VII. Elocution, three times a week, Freshmen, Mr. Palmer and Miss Flesh.

Essays, Freshmen one during the term, Mr. Cairns; Sophomores two, Mr. Knowlton and Mr. Cairns; Juniors two (or one essay and one oration), Prof. Frankenburger, Mr. Knowlton and Mr. Cairns; Seniors one essay or one oration during the term, Prof. Frankenburger.

Orations, Juniors and Seniors, one during the year, Prof. Frankenburger.

Declamations, Freshmen two during the term, Mr. Palmer and Miss Flesh; Sophomores one during the term, Mr. Knowlton and Mr. Cairns.

Rhetoricals, three general rhetorical exercises.

Class Rhetorical Exercises, for all classes once a week.

MATHEMATICS—

I. Algebra, full study, Prof. Van Velzer and Prof. Slichter.

V. Analytic Geometry, full study, Prof. Slichter.

IX to XVI. Special Advanced Courses, if desired, Prof. Van Velzer.

ASTRONOMY—

III. Advanced Special Course, full study, Prof. Comstock.

PHYSICS—

I. Elementary Short Course, full study, Dr. Loomis.

III. Laboratory work, full study, Dr. Loomis.

IV. Advanced laboratory work, full study, Prof. Davies.

V. Mathematical Physics, full study, Prof. Davies.

CHEMISTRY—

I & II. Descriptive Inorganic Chemistry, full study, Prof. Daniells.

III. Organic Chemistry, Quantitative Experimentation, full study, Prof. Daniells. and Dr. Hillyer.

IV. Quantitative Analysis, full study, Prof. Daniells.

Special courses adapted to advanced students.

MINERALOGY—

I. Blowpipe Analysis, three-fifths study, Dr. Hobbs.

II. Crystallography, two-fifths study, Dr. Hobbs.

GEOLOGY—

I. General Geology, full study, Prof. Salisbury and Prof. Van Hise.

II. Microscopic Petrography, two-fifths study, Prof. Van Hise and Dr. Hobbs.

VII. Graduate Course, full study, Pres. Chamberlin and Prof. Van Hise.

ZOOLOGY—

III. Invertebrate Zoology, laboratory work and lectures, full study, Prof. Birge.

IV. Vertebrate Anatomy, laboratory work and recitations, twelve hours per week, Prof. Birge.

V. Histology, two lectures per week, Prof. Birge.

V. Histology, ten laboratory hours per week, Prof. Birge.

VI. Physiology, recitations, three-fifths study, Prof. Birge.

BOTANY—

I. Morphology of Flowering Plants, three-fifths study, Prof. Barnes.

II. General Morphology, two lectures, eight hours' laboratory work per week, Prof. Barnes.

V. Embryology and Physiology, ten hours per week, laboratory work and reading, Prof. Barnes.

VI. Advanced original work, ten to fifteen hours per week, Prof. Barnes.

MILITARY DRILL —

Six hours per week, half study, Col. Cole.

HYGIENE —

Hygiene and Sanitary Science, two-fifths study, Dr. Frisby.

WINTER TERM.

PHILOSOPHY —

II. Experimental Psychology, three-fifths study, Prof. Jastrow.

VII. History of English Philosophy, three-fifths study, Prof. Stearns.

X. Æsthetics, full study, Prof. Stearns.

XII. Logic, full study, Prof. Jastrow.

PEDAGOGY —

II. Philosophy of Education, three-fifths study, Prof. Stearns.

III. School Law and Hygiene, two-fifths study, Prof. Stearns.

CIVICS —

II. English Constitutional Law, full study, Prof. Parkinson.

V. American Constitutional Law, two-fifths study, Prof. Parkinson.

VI. Comparative Constitutional and Administrative Law, two-fifths study, Prof. Parkinson.

VII. Roman Law, three-fifths study, Prof. Parkinson.

XI. Political Economy, Mechanism of Exchange, two-fifths study, Prof. Parkinson.

XII. Political Economy, General Theory of Exchange, three-fifths study, Prof. Parkinson.

HISTORY —

I. Dynastic and Territorial History, three-fifths study, Dr. Haskins.

III. General United States History, two-fifths study, Prof. Turner.

IV. General History, three-fifths study, Dr. Haskins.

V. Nineteenth Century, three-fifths study, Prof. Turner.

VI. Constitutional and Political History, United States, full study, Prof. Turner.

VII. History of Institutions, three-fifths study, Dr. Haskins.

VIII. History of Society, two-fifths study, Prof. Turner.

IX. English Constitutional History, two-fifths study, Dr. Haskins.

XI. Seminary, two-fifths study, Prof. Turner and Dr. Haskins.

GREEK —

I. Elementary Greek Composition and Homer's Iliad, full study, Prof. Kerr.

II. Xenophon's Anabasis, speaking and writing Greek, full study, Prof. Williams

III. Lysias, Homer's Odyssey, full study, Prof. Kerr.

V. Herodotus, one-fifth study, Prof. Kerr.

VI. Euripides' Medea, four-fifths study, Prof. Williams.

VII. Plato's Phaedo, three-fifths study, Prof. Kerr.

VIII. Derivation of Technical Terms, one-fifth study, Prof. Kerr.

IX. New Testament Greek, two-fifths study, Prof. Williams.

X. Greek Seminary, one-fifth study, Prof. Kerr.

LATIN —

I. Vergil's Æneid, full study, Miss Cornelius.
II. Cicero's de Senectute, full study, Miss Cornelius.
III. Cicero's de Senectute, full study, Prof. Bennett.
IV. Terence's Andria, three-fifths study, Prof. Bennett.
V. Tacitus' Germania and Agricola, full study.
VII. Juvenal, two-fifths study, Prof. Bennett.
VIII. Latin Seminary, Text Criticism of Tacitus' Dialogus de Oratoribus, two-fifths study, Prof. Bennett.
IX. Latin Philology, two-fifths study, Prof. Bennett.

SANSKRIT —

I. Elementary, two-fifths study, Prof. Williams.
II. Advanced, two-fifths study, Prof. Williams.

HEBREW —

I. Grammar, Genesis i-viii, two-fifths study, Prof. Williams.
II. Advanced, Samuel, Isaiah, Psalms, two-fifths study, Prof. Williams.
III. Advanced, Hebrew Syntax, one-fifth study, Prof. Williams.
IV. History of Israel, two-fifths study, Prof. Williams.

FRENCH —

I. Otto's French Conversation Grammar, Le Roman d'un Jeune Homme Pauvre (read independently of the class-room), Le Cid, full study, Miss Gay.
II. A modification of (I), for Latin students, with the addition of the history of the French language, full study, Miss Gay.
III. A modification of (I), for Scientific, Engineering and English students, full study, Miss Gay.
IV. { Writing French, and Cinq Mars, two-fifths study, Prof. Owen.
Conversation in French, extra exercise, one hour a week, Miss Gay.
V. { Oral French and Travailleurs de la Mer, three-fifths study, Prof. Owen.
Conversation in French, extra exercise, once a week, Prof. Owen.
Lectures and recitations on History of French literature in French, Prof. Owen.

ITALIAN —

I. Conversation Grammar and Manzoni's Promessi Sposi, one-half study, Prof. Owen. (Given in 1890-1.)

SPANISH —

I. Conversation Grammar and Castellar's Historia del año 1883, Prof. Owen. (Given in 1891-92.)

GERMAN —

I. Reader, full study, Mr. Stempel.
II. Reader of German Literature, two-fifths study, Prof. Rosenstengel.
III. Hermann and Dorothea, three-fifths study, Prof. Rosenstengel.
IV. Faust, two-fifths study, Prof. Rosenstengel.
V. Reader, full study, Prof. Olson.
VI. Reader of German Literature, full study, Prof. Rosenstengel.
VII. Reader, full study, Miss Sterling.
VIII. Goethe's Naturwissenschaftliche Arbeiten, three-fifths study, Miss Sterling.
IX. Goethe's Prosa, two-fifths study, Miss Sterling.
X. Iphigenie, full study, Mr. Stempel.
XI. German Composition, three-fifths study, Prof. Rosenstengel.

NORSE —

I. Frithiof's Saga and Ibsen's Terje Vigen, full study, Prof. Olson.
II. Ibsen's Brand, full study, Prof. Olson.

III. General Survey, two-fifths study, Prof. Olson.
IV. Old Norse or Icelandic, two-fifths study, Prof. Olson.

ENGLISH —

III. Chaucer, Parlament of Foules, two-fifths study, Prof. Freeman.
V General Survey of English Literature, three-fifths study, Prof. Freeman.
VI. English Masterpieces, full study, 1891-92, Prof. Freeman.
VIII. Shakespeare, full study, 1890-91, Prof. Freeman.

RHETORIC AND ORATORY —

II. Rhetoric, Genung's "Practical Rhetoric," three-fifths study, Mr. Knowlton.
IV. English Composition, three-fifths study, Prof. Frankenburger.
VI. Elocution, Othello and Julius Cæsar, and Bell's "Elements of Elocution," two-fifths study, Prof. Frankenburger.
Elocution, three times a week, Freshmen, Mr. Palmer and Miss Flesh.
Declamations, Essays and Orations required of the several classes as during fall term.

MATHEMATICS—

II. Algebra, full study, Prof. Van Velzer and Prof. Slichter.
III. Solid Geometry, full study, Prof. Slichter.
VI. Calculus, full study, Prof. Slichter.
VII. Differential Equations, full study, Prof. Van Velzer.
VIII. Modern Geometry, three-fifths study, Prof. Van Velzer.
IX to XVI. Special advanced courses, if desired, Prof. Van Velzer.

ASTRONOMY —

II. Astronomical Practice, three-fifths study, Prof. Comstock.
III. Advanced special course, full study, Prof. Comstock.

PHYSICS —

II. Elementary Long Course, full study, Dr. Loomis.
III. Laboratory work, full study, Dr. Loomis.
IV. Special advanced laboratory work, full study, Prof. Davies.
V. Mathematical Physics, full study, Prof. Davies.

CHEMISTRY —

I. Qualitative and Quantitative Analysis, full study, Prof. Daniells and Dr. Hillyer
II. Qualitative Analysis, two-fifths study, Dr. Hillyer.
III. Quantitative Analysis, full study, Prof. Daniells.
Special courses adapted for advanced students.

MINERALOGY —

III. General Mineralogy, two-fifths study, Dr. Hobbs.
IV. Determinative Mineralogy, three-fifths study, Dr. Hobbs.

GEOLOGY —

III. Special Geology, three-fifths study, Prof. Salisbury.
IV. Volcanic and Petrographic Geology, two-fifths study, Dr. Hobbs.
VII. Graduate Course, full study, Prof. Salisbury, Dr. Hobbs.

ZOOLOGY —

I. General Zoology, recitations, two-fifths study, Prof. Birge.
II. General Zoology, laboratory course, two recitations, eight hours' laboratory work per week, Prof. Birge.
III. Invertebrate Zoology, ten hours' lectures and laboratory work per week, Prof. Birge.
IV. Vertebrate Anatomy, two recitations, ten hours' laboratory work per week Prof. Birge.
VI. Physiology, three-fifths study, Prof. Birge.

BACTERIOLOGY —

I. Two recitations, ten hours' laboratory work per week, Prof. Birge.

BOTANY —

I. Morphology of Flowering Plants, laboratory work, four hours per week, Prof. Barnes.

III. General Morphology, ten hours per week laboratory work and reading, Prof. Barnes. (1890–1.)

IV. Histology, ten hours per week laboratory work and reading, Prof. Barnes. (1891–2.)

V. Physiology, ten hours per week laboratory work and reading, Prof. Barnes.

VI. Advanced original work, ten to fifteen hours per week, Prof. Barnes.

MILITARY TACTICS —

Twice a week, Col. Cole.

HYGIENE —

Hygiene and Sanitary Science, two-fifths study, Dr. Frisby.

SPRING TERM.

PHILOSOPHY —

III. Comparative Psychology, one-fifth study, Prof. Jastrow.

IV. Morbid Psychology, one-fifth study, Prof. Jastrow.

V. Anthropological Psychology, one-fifth study, Prof. Jastrow.

IX. Ethics, full study, Prof. Stearns.

XI. History of Art, two-fifths study, Prof. Stearns.

XIII. Advanced Logic, two-fifths study, Prof. Jastrow.

XIV. Mill's Logic, three-fifths study, Prof. Jastrow.

PEDAGOGY —

IV. Kindergarten and Primary School, Methods and Management, two-fifths study, Prof. Stearns.

V. Grammar and High School, Methods and Management, three-fifths study, Prof. Stearns.

VI. Seminary, Educational Problems, twice a week, Prof. Stearns.

CIVICS —

III. American Constitutional Law, full study, Prof. Parkinson.

VIII. International Law, two-fifths study, Prof. Parkinson.

IX. Commercial Law, two-fifths study, Prof. Parkinson.

XIII. Political Economy, Taxation and Finance, two-fifths study, Prof. Parkinson.

HISTORY —

I. Dynastic and Territorial History, three-fifths study, Dr. Haskins.

III. General United States History, two-fifths study, Prof. Turner.

IV. General History, three-fifths study, Dr. Haskins.

V. Nineteenth Century, three-fifths study, Prof. Turner.

VI. Constitutional and Political History, United States, full study, Prof. Turner.

VII. History of Institutions, three-fifths study, Dr. Haskins.

IX. English Constitutional History, two-fifths study, Dr. Haskins.

XI. Seminary, two-fifths study, Prof. Turner and Dr. Haskins.

GREEK —

I. Elementary, Homer's Iliad, full study, Prof. Kerr.
II. Xenophon's Anabasis, speaking and writing Greek, full study, Prof. Williams.
IV. Homer's Odyssey, three-fifths study, Prof. Williams.
V. Lyric Poetry, full study, Prof. Kerr.
VII. Plato's Protagoras, three-fifths study, Prof. Kerr.
VIII. Derivation of Technical Terms, one-fifth study, Prof. Kerr.
IX. New Testament Greek, two-fifths study, Prof. Williams.
X. Greek Seminary, one-fifth study, Prof. Kerr.

LATIN —

I. Vergil's Æneid, full study, Miss Cornelius.
III. Cicero's Letters, two-fifths study, Prof. Bennett.
IV. Horace's Satires and Epistles, three-fifths study, Prof. Bennett.
V. Horace's Satires and Epistles, full study.
VII. Lectures on the History of Roman Literature, two-fifths study, Prof. Bennett.
VIII. Latin Seminary, Text-Criticism of Tacitus' Dialogus de Oratoribus, two-fifths study, Prof. Bennett.
IX. Latin Philology, two-fifths study, Prof. Bennett.
X. Teachers' Class, one-fifth study, Prof. Bennett.

SANSKRIT —

I. Elementary, two-fifths study, Prof. Williams.
II. Advanced, two-fifths study, Prof. Williams.

HEBREW —

I. Grammar, Genesis i–viii, two-fifths study, Prof. Williams.
II. Advanced, Samuel, Isaiah, Psalms, two-fifths study, Prof. Williams.
III. Advanced, Hebrew Syntax, one-fifth study, Prof. Williams.
IV. History of Israel, two-fifths study, Prof. Williams.

FRENCH —

I. Otto's French Conversation Grammar, La Petite Fadette (read independently of the class-room) Le Misanthrope, Athalie, full study, Miss Gay.
II. A modification of (I), for Latin students, with the addition of the history of the French language, full study, Miss Gay.
III. A modification of (I), for Scientific, Engineering and English students, full study, Miss Gay.
IV. Lectures on History of French Language, in French.
Writing French, two-fifths study, Prof. Owen.
Conversation in French, extra exercise, one hour a week, Miss Gay.
V. Oral French and Les Travailleurs de la Mer, three-fifths study, Prof. Owen.
Lectures and recitations on French Literature, in French.
Conversation in French, extra exercise, one hour a week, Prof. Owen.

ITALIAN —

I. Manzoni's Promessi Sposi, one-half study, Prof. Owen. (Given in 1890–1.)

SPANISH —

I. Conversation Grammar and Castelar's Historia del año 1883, Prof. Owen. (Given in 1891–2).

GERMAN —

I. Reader of German Literature, full study, Mr. Stempel.
II. Die Journalisten, two-fifths study, Prof. Rosenstengel.
III. Nathan der Weise, three-fifths study, Prof. Rosenstengel.
IV. Lectures, two-fifths study, Prof. Rosenstengel.
V. Reader, full study, Prof. Olson.
VI. Reader of German Literature, full study, Prof. Rosenstengel.

VII. Einfuehrung in die Naturwissenschaften, full study, Miss Sterling.
VIII. Chemie, three-fifths study, Miss Sterling.
IX. Historische Skizzen, two-fifths study, Miss Sterling.
X. Laokoon, full study, Mr. Stempel.
XI. Composition, three-fifths study, Prof. Rosenstengel.
XII. Language Teaching, one-fifth study, Prof. Rosenstengel.

NORSE —
I. Selections from Björnson's stories and poems, full study, Prof. Olson.
II. Lie's Den Fremsynte and Swedish selections from Runeberg and Tegnèr, full study, Prof. Olson.
III. General Survey, two-fifths study, Prof. Olson.
IV. Old Norse or Icelandic, two-fifths study, Prof. Olson.

ENGLISH —
I, Anglo-Saxon Reader, full study, Prof. Freeman.
IV. Early English, full study, Prof. Freeman.
IX. American Prose Writers, full study, 1890-1, Prof. Freeman.
VII. American Poets, full study, 1891-92, Prof. Freeman.

RHETORIC AND ORATORY —
Essays, Declamations and Orations by the Freshmen, Sophomores and Juniors as during winter term.

MATHEMATICS —
IV. Trigonometry, full study. Prof. Van Velzer and Prof. Slichter.
VI. Calculus, full study, Prof. Slichter.
VII. Differential Equations, full study, Prof. Van Velzer.
IX to XVI. Special advanced Courses, if desired, Prof. Van Velzer.

ASTRONOMY —
I. Short Course, full study, Prof. Comstock.
II. Astronomical Practice, three-fifths study, Prof. Comstock.
III. Advanced special course, full study, Prof. Comstock.

PHYSICS —
II. Elementary Long Course, full study, Dr. Loomis.
III. Laboratory Work, full study, Dr. Loomis.
IV. Advanced Laboratory work, full study, Prof. Davies.
V. Mathematical Physics, full study, Prof. Davies.

CHEMISTRY —
I. Descriptive Organic Chemistry, full study, Dr. Hillyer.
II. Qualitative Analysis, two-fifths study, Dr. Hillyer.
III. Advanced Organic Chemistry, full study, Dr. Hillyer, *or*,
Quantitative Inorganic Analysis, full study, Prof. Daniells.
VIII. Short Course, full study, Prof. Daniells.
Special courses adapted to advanced students.

MINERALOGY —
V. Descriptive Mineralogy, two-fifths study, Dr. Hobbs.
VI. Microscopic Mineralogy, three-fifths study, Dr. Hobbs.

GEOLOGY —
V. Applied Geology, full study, Prof. Van Hise.
VI. Practical Field Geology, three-fifths study, Pres. Chamberlin.
VII. Graduate Course, full study, Pres. Chamberlin and Prof. Van Hise.

ZOOLOGY —
I. General Zoology, recitations, two-fifths study, Prof. Birge.
II. General Zoology, laboratory course, two recitations and eight hours laboratory work per week, Prof. Birge.

III. Invertebrate Zoology, ten hours laboratory work and lectures per week, Prof. Birge.

VII. Embryology, three recitations, ten hours in laboratory per week, Prof. Birge.

BACTERIOLOGY —

I. Advanced laboratory work, full study, Prof. Birge.

BOTANY —

III. General Morphology, ten hours laboratory work per week, Prof. Barnes (1890-91).

IV. Histology, ten hours laboratory work per week, Prof. Barnes (1891-92).

V. Physiology, ten hours laboratory work per week, Prof. Barnes.

VI. Advanced original work, ten to fifteen hours per week, Prof. Barnes.

MILITARY DRILL —

Six hours a week, Col. Cole.

GENERAL COURSES OF STUDY.

ANCIENT CLASSICAL COURSE.

The subcourses will be found described more fully under their appropriate heads on the pages following these courses of study. "Full study" signifies five recitations, lectures or equivalent exercises a week; "three-fifths study," three exercises, etc.

FRESHMAN YEAR.

FALL TERM.

GREEK, subcourse III, Lysias, *full study.*

LATIN, subcourse III, Livy, *full study.*

MATHEMATICS, subcourse I, Algebra, *full study.*

WINTER TERM.

GREEK, subcourse III, Lysias, Homer's Odyssey, *full study.*

LATIN, subcourse III, Cicero de Senectute, *full study.*

MATHEMATICS, subcourse III, Solid Geometry, *full study.*

SPRING TERM.

GREEK, subcourse IV, Homer's Odyssey, *three-fifths study.*

LATIN, subcourse III, Cicero's Letters, *two-fifths study.*

MATHEMATICS, subcourse IV, Trigonometry, *full study.*

ANGLO-SAXON, subcourse I, Reader, *full study.*

Elocution as a three-fifths study for either fall or winter term.

Hygiene as a two-fifths study for either fall or winter term.

Class rhetorical exercises, weekly throughout the year.

Latin composition and reading at sight and Greek composition throughout the year.

Military drill throughout the year. Military tactics in the winter term, optional.

SOPHOMORE YEAR.

FALL TERM.

Required Studies—

GREEK, subcourse VI, Demosthenes' Olynthiacs, *three-fifths study.* Subcourse V, Herodotus, *two-fifths study.*

LATIN, subcourse V, Horace's Odes and Epodes and Plautus' Mostellaria, *full study.*

RHETORIC, subcourse II, Principles of Rhetoric, *two-fifths study.*

Elective Studies—

MATHEMATICS, subcourse V, Analytic Geometry, *full study.*

ELEMENTARY MECHANICS, subcourse II, *three-fifths study.*

ENGLISH, subcourse II, Advanced Anglo-Saxon, *two-fifths study.*

SCIENCE, Physics I, Chemistry I or II, Physiology VI, or Botany I or II.

WINTER TERM.

Required Studies—

GREEK, subcourse VI, Euripides' Medea, *four-fifths study.* Subcourse V, Herodotus, *one-fifth study.*

LATIN, subcourse V, Tacitus's Germania and Agricola, *full study.*

RHETORIC, subcourse II, Principles of Rhetoric, *three-fifths study.*

Elective Studies—

MATHEMATICS, subcourse VI, Calculus, *full study.*

ENGLISH, subcourse III, Chaucer's Parlament of Foules, *two-fifths study.*

SCIENCE, Physics II, Chemistry I or II, Zoology I or II, Physiology VI, or Botany I or IV.

SPRING TERM.

Required Studies—

GREEK, subcourse V, Lyric Poetry, *full study.*

LATIN, subcourse V, Horace's Satires and Epistles, *full study.*

Elective Studies—

EARLY ENGLISH, subcourse IV, Chaucer's Canterbury Tales, *full study.*

MATHEMATICS, subcourse VI, Calculus, *full study.*

SCIENCE, Botany IV, Zoology I or II, Chemistry I, II or VIII, or Physics II.

LATIN, occasional exercises in sight-reading and composition throughout the year.

Class rhetorical exercises weekly throughout the year.

Military drill throughout the year. Military tactics in the winter term, optional.

JUNIOR AND SENIOR YEARS.

The work of the Junior and Senior years is chiefly elective. Psychology and two additional terms of philosophical study, political economy, constitutional law, a general survey of English literature and the elements of physics, chemistry, botany and zoology are required for graduation, and if they have not been satisfactorily acquired before, must be taken during either the Junior or Senior year. The student, subject to the advice of his class-officer, may choose one or more leading courses and pursue these continuously with a view to thoroughness and mastery, adding shorter courses to them to give breadth and general culture, or he may distribute his studies more widely with a view to general information and balanced development. The elections may embrace any study offered by the University which the student can advantageously pursue. The general list previously given will be found convenient in making selections.

MODERN CLASSICAL COURSE.

FRESHMAN YEAR.

FALL TERM.

LATIN, subcourse II, Livy, *full study.*

GERMAN, subcourse I, Grammar reviewed, Reader, Conversation, *full study.*

MATHEMATICS, subcourse I, Algebra, *full study.*

WINTER TERM.

LATIN subcourse II, Cicero de Senectute, *full study.*

GERMAN subcourse I, Reader, Conversation, *full study.*

MATHEMATICS, subcourse II, Theory of Equations, Graphic Algebra, Determinants, *full study.*

SPRING TERM.

GERMAN, subcourse I, Reader of German Literature, *full study.*

MATHEMATICS, subcourse IV, Trigonometry, *full study.*

ANGLO-SAXON, subcourse I, Reader, *full study.*

Latin and German Composition throughout the year.

Class rhetorical exercises weekly throughout the year.

Military drill throughout the year. Tactics (optional) in the winter term.

Elocution as a three-fifths study for either fall or winter term.

Hygiene as a two-fifths study for either fall or winter term.

SOPHOMORE YEAR.

FALL TERM.

Required Studies—

LATIN, subcourse IV, Horace's Odes, *two-fifths study.*

GERMAN, subcourse II, Reader of German Literature, *three-fifths study.*

FRENCH, subcourse I, Conversation Grammar, Le Roman d'un Jeune Homme Pauvre, *full study.*

RHETORIC, subcourse II, Principles of Rhetoric, *two-fifths study.*

Elective Studies—

MATHEMATICS, subcourse V, Analytic Geometry, *full study.*

ELEMENTARY MECHANICS, subcourse II, *three-fifths study.*

ENGLISH, subcourse II, Advanced Anglo-Saxon, *two-fifths study.*

GREEK, with any class for which the student is fitted.

SCIENCE, Physics I, Chemistry I or II, Physiology VI, or Botany I or II.

WINTER TERM.

Required Studies—

LATIN, subcourse IV, Terence's Andria, *three-fifths study.*

GERMAN, subcourse II, Reader of German Literature, *two-fifths study.*

FRENCH, subcourse I, Le Cid, Le Roman d'un Jeune Homme Pauvre, *full study.*

RHETORIC, subcourse II, Principles of Rhetoric, *three-fifths study.*

Elective Studies—

MATHEMATICS, subcourse VI, Calculus, *full study.*

ENGLISH, subcourse III, Chaucer's Parlament of Foules, *two-fifths study.*

GREEK, with any class for which the student is fitted.

SCIENCE, Physics II, Chemistry I or II, Zoology I or II, Physiology VI, or Botany I or IV.

SPRING TERM.

Required Studies—

LATIN, subcourse IV, Horace's Satires and Epistles, *three-fifths study.*

GERMAN, subcourse II, Freytag's Die Journalisten, *two-fifths study.*

FRENCH, subcourse I, Le Misanthrope, Athalie, La Petite Fadette, *full study.*

Elective Studies—

MATHEMATICS, subcourse VI, Calculus, *full study.*

EARLY ENGLISH, subcourse IV, Chaucer's Canterbury Tales, *full study.*

GREEK, with any class for which the student is fitted.

SCIENCE, Botany IV, Chemistry I, II, or VIII, Physics II, Zoology I or II.

Class rhetorical exercises once a week through the year.

Military drill throughout the year. Tactics (optional) in the winter term.

JUNIOR AND SENIOR YEARS.

The work of the Junior and Senior years is chiefly elective. Psychology and two additional terms of philosophical study, political economy, constitutional law, a general survey of English literature and the elements of physics, chemistry, botany and zoology are required for graduation, and if they have not been satisfactorily acquired before, must be taken during either the Junior or Senior year. The student, subject to the advice of his class-officer, may choose one or more leading courses and pursue these continuously with a view to thoroughness and mastery, adding shorter courses to them to give breadth and general culture, or he may distribute his studies more widely with a view to general information and balanced development. The elections may embrace any study offered by the University which the student can advantageously pursue. The general list given above will be found convenient in making selections.

GENERAL SCIENCE COURSE.

FRESHMAN YEAR.

FALL TERM.

MATHEMATICS, subcourse I, Algebra, *full study.*
GERMAN, subcourse VII, Reader, *full study.*
BOTANY, subcourse II, General Morphology, *full study.*

WINTER TERM.

MATHEMATICS, subcourse II, Algebra, *full study.*
GERMAN, subcourse VII, Reader, *full study.*
ZOOLOGY, subcourse II, General Zoology, *full study.*

SPRING TERM.

MATHEMATICS, subcourse IV, Trigonometry, *full study.*
GERMAN, subcourse VII, Scientific Reader, *full study.*
ZOOLOGY, subcourse II, General Zoology, *full study.*
Class rhetorical exercises weekly through the year.
Elocution, as a three-fifths study for either fall or winter term.
Hygiene as a two-fifths study for either the fall or winter term.
Military drill throughout the year. Military tactics (optional) in the winter term.

SOPHOMORE YEAR.

FALL TERM.

Required Studies—

RHETORIC, subcourse I, Principles and Practice, *full study.*

CHEMISTRY, subcourse II, Descriptive Inorganic, *full study.*

*GERMAN, subcourse VIII, Die Bakterien, *two-fifths study.*

MECHANICS, subcourse II, Elementary, *three-fifths study.*

ANALYTIC GEOMETRY, subcourse V, *full study.*

(*Required in place of mechanics of students intending to take advanced physics or astronomy.*)

Elective Studies, sufficient to make up three full studies.

Students desiring to take French through the year may postpone rhetoric until the winter term, or take it as a two-fifths study in the fall term and a three-fifths study in the winter term. German may be elected as a three-fifths study (subcourse IX).

WINTER TERM.

Required Studies—

CHEMISTRY, subcourse II, Qualitative Analysis, *two-fifths study.*

PHYSICS, subcourse II, Experimental Lectures, *full study.*

*GERMAN, subcourse VIII, Goethe's Naturwissenschaftliche Arbeiten, *three-fifths study.*

CALCULUS, subcourse VI, *full study.*

(*Required of students contemplating advanced astronomy or physics.*)

Elective Studies, sufficient to make up three full studies.

SPRING TERM.

Required Studies—

CHEMISTRY, subcourse II, Qualitative Analysis, *two-fifths study.*

PHYSICS, subcourse II, Experimental Lectures, *full study.*

*GERMAN, subcourse VIII, Chemie, *three-fifths study.*

CALCULUS, subcourse VI, *full study.*

(*Required of students contemplating advanced astronomy or physics.*)

Elective Studies sufficient to make up three full studies.

Class rhetorical exercises once a week through the year.

Military drill throughout the year. Military tactics (optional) in winter term.

JUNIOR AND SENIOR YEARS.

Required Studies—

1. SCIENCE. At least three terms of "long course" science must be taken in each year. The sciences are divided into two groups, one, embracing astronomy, physics and chemistry; the other,

*Required of those who do not elect French as a long course.

zoology (including vertebrate anatomy), botany and mineralogy and geology. One long course, a year's work, must be taken from from each of these groups. The short course in geology must be taken, if that study is not taken as a long course, and the short course in astronomy must be taken. Advanced mathematics may be substituted for one course in science. The physics, chemistry and mathematics required in the Sophomore year will not count as long course work in the Junior and Senior years.

2. LANGUAGE AND LITERATURE. At least one year in English or French. Advanced French or German must be taken as a half-study for at least one year. German or French may be taken in the Sophmore year, as stated above.
3. PHILOSOPHY. Psychology, one term, which may be in Junior or Senior year. Civics, or philosophical studies, two additional terms.
4. RHETORICALS. Five essays and one oration during Junior year; three essays and one oration during Senior year.

Elective Studies—

Enough elective work must be done to make a total of *thirty-nine* terms' work during the course, besides elocution, hygiene, military drill and rhetorical exercises. The elective work must be selected and pursued under the advice and approval of the class-officer.

ENGLISH COURSE.

FRESHMAN YEAR.

FALL TERM.

LANGUAGE, *either elementary French, German or Norse, or Latin with Greek Class.*

German, subcourse V, Elementary, *full study.*

French, subcourse III, Elementary, *full study.*

Latin, subcourse I, Cicero's Orations, Latin Composition, *full study.*

Norse, subcourse I, Elementary, *full study.*

HISTORY—

Subcourse I, Dynastic and Territorial History, *three-fifths study.*

Subcourse II, English History, *two-fifths study.*

MATHEMATICS—

Subcourse I, Algebra, *full study.*

German or Latin, if chosen, must be pursued for two years. If French is taken, it must be pursued through the Freshman year, at the end of

which the alternative is offered of continuing French as a half-study through the Sophomore and Junior years (in which case subcourse I should be substituted for subcourse III) or of substituting English Language.

WINTER TERM.

LANGUAGE —

German, continued, subcourse V, *full study*, or

French, continued, subcourse III, *full study*, or

Latin, subcourse I, Vergil's Æneid, Latin Prosody, Composition, *full study*, or

Norse, subcourse I, Frithiof's Saga, *full study*.

HISTORY —

Subcourse I, Dynastic and Territorial, *three-fifths study*.

Subcourse III, General United States, *two-fifths study*.

MATHEMATICS —

Subcourse II, Algebra, *full study*.

SPRING TERM.

LANGUAGE —

German, continued, subcourse V, *full study*, or

French, continued, subcourse III, *full study*, or

Latin, subcourse I, Vergil's Æneid, Composition, *full study*, or

Norse, subcourse I, Björnson, *full study*.

MATHEMATICS —

Subcourse IV, Trigonometry, Plane and Spherical, *full study*.

HISTORY —

Subcourse I, Dynastic and Territorial, *three-fifths study*.

Subcourse III, General United States, *two-fifths study*.

Anglo-Saxon may be taken instead of trigonometry, which must then be taken in the spring term of the Sophomore year instead of English.

Military drill throughout the year. Military tactics (optional) in the winter term.

Rhetoricals weekly, throughout the year.

Elocution as a *three-fifths study* for either fall or winter term.

Hygiene as a *two-fifths study* for either fall or winter term.

SOPHOMORE YEAR.

FALL TERM.

LANGUAGE — *One of the following:*

French, subcourse IV, Cinq Mars, Translation into French, *three-fifths study*.

German, subcourse VI, Reader, *full study*.

Latin, subcourse III, Livy, *full study*.

English, subcourse II, Advanced Anglo-Saxon, *two-fifths study* (*alternative to French.*)

Norse, subcourse II, Kielland's Skipper Worse, *full study.*

RHETORIC, subcourse I, Principles, *full study.*

SCIENCE — *One of the following:*

Chemistry, subcourse I or II, Inorganic, *full study.*

Botany, subcourse II, General Morphology, *full study.*

Mathematics, subcourse V, Analytic Geometry, *full study.*

Physiology, subcourse VI, *three-fifths study.*

WINTER TERM.

LANGUAGE — *One of the following:*

French, subcourse IV, continued, *two-fifths study.*

German, subcourse VI, Reader of Literature, *full study.*

Latin, subcourse III, Cicero de Senectute, *full study.*

Norse, subcourse II, Ibsen's Brand, *full study.*

ENGLISH, subcourse III, Chaucer's Parlament of Foules, *two-fifths study.*

RHETORIC, subcourse IV, English Composition, *three-fifths study.*

SCIENCE — *One of the following branches:*

Physics, subcourse II, Experimental Lectures, *full study.*

Zoology, subcourse I or II, *full or two-fifths study.*

Botany, subcourse IV, Histology, *full study.*

Physiology, subcourse VI, *three-fifths study.*

Chemistry, subcourse I or II, Qualitative Analysis, *two-fifths or full study.*

Mathematics, subcourse VI, Calculus, *full study.*

SPRING TERM.

LANGUAGE — *One of the following:*

French, subcourse IV, continued, Lectures on French Language, *two-fifths study.*

German, subcourse VI, Reader of Literature, *full study.*

Latin, subcourse III, Cicero's Letters, *two-fifths study.*

Norse, subcourse II, Lie's Den Fremsynte, *full study.*

ENGLISH, subcourse IV, English of the XIV Century, *full study.*

SCIENCE — *One of the following:*

Physics, subcourse II, Experimental Lectures, *full study.*

Chemistry, subcourse I, II, or VIII, *two-fifths or full study.*

Zoology, subcourse I or II, *full or two-fifths study.*

Botany, subcourse IV, Histology, *full study.*

Mathematics, subcourse VI, Calculus, *full study.*

Rhetorical and elocutionary work weekly throughout the year. Military drill throughout the year. Military tactics (optional) in the winter term.

JUNIOR AND SENIOR YEARS.

The work of the Junior and Senior years is chiefly elective. Psychology and two additional terms of philosophical study, political economy, constitutional law, a general survey of English literature and the elements of physics, chemistry, zoology, and botany are required for graduation, and if they have not been satisfactorily acquired before, must be taken during either the Junior or Senior year. Three terms' work in science must be taken in the University. The student with the advice of his class-officer, may choose one or more leading courses and pursue them continuously with a view to thoroughness and mastery, adding shorter courses to give breadth and general culture, or he may distribute his studies more widely with a view to general information and balanced culture. The elections may embrace any study offered by the University which the student can advantageously pursue. Enough elective work must be done to make a total of *thirty nine* terms' work during the course, besides military drill and rhetorical exercises. The general list of studies given above will be used in making elections.

THE CIVIC-HISTORICAL COURSE, ANTECEDENT TO LAW AND JOURNALISM.

For the benefit of those contemplating the study of law or journalism, the following studies in civil polity, economics and historical science, together with literary and philosophical branches, have been arranged so as to constitute the work of the Junior and Senior years of the collegiate course. Students in either of the Classical Courses or in the English Course may take the greater number of these studies and still graduate with the degree appropriate to the course they are pursuing. To do this they should take as much of the required science as possible during the Sophomore year. Students of the English Course will have had American, dynastic and territorial history. Students are thus enabled to profit by an adaptation of their college course to their future work without essential deviation from the general purposes of collegiate training.

Special students may take this course without the regular work of the Freshman and Sophomore years, but they are advised not to do so except when they have attained a considerable degree of maturity.

FRESHMAN AND SOPHOMORE YEARS.

The Freshman and Sophomore studies of any of the four regular college courses may constitute the first two years of this course.

The work of the Junior and Senior years will be elected chiefly from the departments of history, civics, political economy and English literature. If the student desires a bachelor's degree, he must take also the required studies of one of the regular college courses. The studies in the departments named and which are open to election are as follows:

FALL TERM.

CIVICS —

Elementary Law, subcourse I, *full study.*

American Constitutional Law (advanced course), subcourse IV, *two-fifths study.*

POLITICAL ECONOMY —

Elementary Political Economy, subcourse X, *full study.*

HISTORY —

Dynastic and Territorial History, subcourse I, *three-fifths tudy.*

English History, subcourse II, *two-fifths study.*

General History, subcourse IV, *three-fifths study.*

History of the XIXth Century, subcourse V, *three-fifths study.*

Constitutional and Political History of the United States, subcourse VI, *full study.*

English Constitutional History, subcourse IX, *two-fifths study.*

Historical Seminary, subcourse XI, *two-fifths study.*

Subcourses I and II are elementary and should precede any of the other courses.

ENGLISH —

English Literature, subcourse V, *three-fifths study.*

PSYCHOLOGY and LANGUAGE may also be taken during this term under like conditions.

WINTER TERM.

CIVICS —

English Constitutional Law, subcourse II, *full study.*

American Constitutional Law, subcourse V, *two-fifths study.*

Comparative Constitutional Law, subcourse VI, *two-fifths study.*

Roman Law, subcourse VII, *three-fifths study.*

POLITICAL ECONOMY —

Money, Credit and Banking, subcourse XI, *two-fifths study.*

General Theory of Exchange, subcourse XII, *three-fifths study.*

HISTORY —

Dynastic and Territorial History, subcourse I, *three-fifths study.*
General United States History, subcourse III, *two-fifths study.*
General History, subcourse IV, *three-fifths study.*
History of the XIXth Century, subcourse V, *three-fifths study.*
Constitutional and Political History of the United States, subcourse VI, *full study.*
History of Institutions, subcourse VII, *three-fifths study.*
English Constitutional History, subcourse IX, *two-fifths study.*
Seminary, subcourse XI, *two-fifths study.*

ENGLISH —

General Survey of English Literature, subcourse V, *three-fifths study.*
English Masterpieces, subcourse VI, *full study.*

PHILOSOPHY and LANGUAGE, if elected in previous term, may be continued.

SPRING TERM.

CIVICS —

American Constitutional Law, Elementary, subcourse III, *full study.*
International Law, subcourse VIII, *two-fifths study.*
Commercial Law, subcourse IX, *two-fifths study.*

POLITICAL ECONOMY —

Taxation, Finance, subcourse XIII, *two-fifths study.*

HISTORY —

Dynastic and Territorial History, subcourse I, *three-fifths study.*
General United States History, subcourse III, *two-fifths study.*
General History, subcourse IV, *three-fifths study.*
History of the XIXth Century, subcourse V, *three-fifths study.*
Constitutional and Political History of the United States, subcourse VI, *full study.*
History of Institutions, subcourse VII, *three-fifths study.*
English Constitutional History, subcourse IX, *two-fifths study.*
Seminary, subcourse XI, *two-fifths study.*

ENGLISH —

Early English, subcourse IV, *full study.*
American Poets, subcourse VII, *full study.*

PHILOSOPHY and LANGUAGE, if previously elected, may be continued.

SPECIAL SCIENCE COURSE, ANTECEDENT TO MEDICINE.

The University offers the following Special Course in Science, arranged for those contemplating the study of medicine and surgery. It is intended to give a broad and solid foundation for the professional medical course, together with collegiate culture.

The Chicago College of Physicians and Surgeons, Rush Medical College and the Chicago Medical College have approved the course and will accept it as the equivalent of one year's study, thus enabling those who have taken the four years' course here to complete their medical course in these excellent colleges in two years.

All the studies given cannot be taken in the time allotted. Three full studies are required during each term, which may be chosen from those given. If the degree of Bachelor of Science is sought the *required* studies of the General Science Course must be taken.

From the branches offered, special students may select a two years' course embracing the larger portion of those subjects which bear directly upon the studies of medicine and surgery. A more liberal course, however, is recommended, which shall embrace not only all of these sciences, but cognate branches and a due measure of language and of mental science, substantially as outlined in the following course:

FRESHMAN YEAR.

FALL TERM.

ELEMENTARY BOTANY, subcourse I, *three-fifths study.*
BOTANY, subcourse II, Morphology, *full study,*
GERMAN or FRENCH, Elementary or Advanced, *full or half study.*
MATHEMATICS, subcourse I, Algebra, *full study.*

WINTER TERM.

ELEMENTARY BOTANY, subcourse I, *three-fifths study.*
ZOOLOGY, subcourse II, General, *full study.*
MATHEMATICS, subcourse II, Theory of Equations, *full study.*
GERMAN or FRENCH, continued.

SPRING TERM.

ZOOLOGY, subcourse II, General, *full study.*
MATHEMATICS, subcourse IV, Trigonometry, *full study.*
GERMAN or FRENCH, continued.

SOPHOMORE YEAR.

FALL TERM.

ZOOLOGY, subcourse IV, Vertebrate Anatomy, *full study.*
CHEMISTRY, subcourse I, Descriptive Inorganic, *full study.*
BOTANY, subcourse II, General Morphology, *full study.*
MECHANICS, subcourse II, *three-fifths study.*
GERMAN or FRENCH.

WINTER TERM.

ZOOLOGY, subcourse IV, Vertebrate Anatomy, *full study.*
CHEMISTRY, subcourse I or II, Qualitative Analysis, *two-fifths or full study.*
BOTANY, subcourse III, General Vegetable Morphology, *full study.*
BOTANY, subcourse IV, Vegetable Histology, *full study.*
PHYSICS, subcourse II, *full study.*
GERMAN or FRENCH, continued.

SPRING TERM.

ZOOLOGY, subcourse VII, Animal Embryology, *full study.*
CHEMISTRY, subcourse I or II, Qualitative Analysis, *two-fifths or full study.*
BOTANY, subcourse III, General Vegetable Morphology, *full study,*
BOTANY, subcourse IV, Vegetable Histology, *full study.*
PHYSICS, subcourse II, *full study.*
GERMAN or FRENCH, continued.

JUNIOR YEAR.

FALL TERM.

BOTANY, subcourse V, Vegetable Embryology and Physiology, *full study.*
ZOOLOGY, subcourse VI, Human Physiology, *three-fifths study.*
Subcourse V, Animal Histology, *two-fifths or full study.*
CHEMISTRY, subcourse III, Descriptive Organic Chemistry, *full study half the term.*
CHEMISTRY, subcourse IV, Quantitative Analysis, Volumetric and Gravimetric, *full or partial study.*
PHARMACEUTICAL CHEMISTRY, subcourse I, *three-fifths study.*
EXPERIMENTAL PHYSICS, subcourse III, *full study.*

WINTER TERM.

BOTANY, subcourse V, Vegetable Physiology, *full study.*
ZOOLOGY, subcourse VI, Human Physiology, *three-fifths study.*
BACTERIOLOGY, subcourse I, *full study.*
CHEMISTRY, subcourse III, Quantitative Analysis, *full or partial study.*
PHARMACEUTICAL CHEMISTRY, subcourse II, *three-fifths study.*
EXPERIMENTAL PHYSICS, subcourse III, *full study.*

SPRING TERM.

BOTANY, subcourse V, Vegetable Physiology, *full study.*
ZOOLOGY, subcourse VIII, Advanced Histology or Bacteriology, *full study.*
ORGANIC CHEMISTRY, subcourses III or IV, *full or partial study.*
TOXICOLOGY AND URINE ANALYSIS, subcourse VI, *part term studies.*

SENIOR YEAR.

FALL TERM.

CHEMISTRY, subcourse IV, Advanced work, organic and inorganic, *amount optional.*
MATERIA MEDICA, subcourse II, *three-fifths study.*
ZOOLOGY, subcourse VIII, Advanced and original work, *full study.*
BOTANY, subcourse VI, Advanced and original work, *full study.*
MINERALOGY, subcourse I, Blowpipe Analysis, *three-fifths study.**
GEOLOGY, subcourses, I and II, *full or three-fifths study.*
PSYCHOLOGY, subcourse I, *full study.*

WINTER TERM.

CHEMISTRY, subcourse IV, Advanced work, organic or inorganic, *amount optional.*
MATERIA MEDICA, subcourse II, *three-fifths study.*
ZOOLOGY, subcourse VIII, Advanced and original work, *full study.*
BOTANY, subcourse VI, Advanced and original work, *full stydy.*
GEOLOGY, subcourse III, Special Geology, *three fifths study.*
GEOLOGY, subcourse IV, Volcanic and Petrographic Geology, *two-fifths study.*

SPRING TERM.

CHEMISTRY, subcourse IV, Advanced work, organic and inorganic, *amount optional.*
ZOOLOGY, subcourse VIII, Advanced and original work, *full study.*
BOTANY, subcourse VI, Advanced and original work, *full study.*

Rhetorical work and military drill required as of other students.

Students completing the *required studies* of the General Science Course (which see) and sufficient of the foregoing to make a total of thirty-nine terms' work during the course will be entitled to the degree of Bachelor of Science.

* Mineralogy should be taken in the Junior Year if the long course in Geology is contemplated.

SPECIAL COURSES FOR NORMAL GRADUATES.

To afford graduates of the State Normal Schools facilities for extending their studies advantageously, and, at the same time, to attain a recognized standing leading to a degree, without loss of time or inconvenience arising from the want of adjustment of their previous studies to the standard college courses, the following special courses have been adopted by the University. To these courses the regular graduates from the advanced courses of the State Normal Schools of Wisconsin will be admitted with the rank of Juniors. Two years of successful study will enable the graduates to complete one of the courses, and, by proper selection of studies, to graduate with the degree of Bachelor of Letters (English Course) or of Bachelor of Science.

The courses presented are essentially elective, but if regular graduation and a degree are sought, the range of election is restricted in important particulars. It is felt that in all but exceptional cases the greatest benefit will be secured by protracted study in definite lines, since the previous courses of the candidates have consisted of a somewhat wide range of relatively short studies. The student rarely becomes possessed of the real life and spirit of a language, a science or a philosophy, except through prolonged, continuous study. The acquisition of this deeper vital insight is deemed of supreme importance to the truest scholarship. The requirements imposed, however, but partially enforce this view; they are rather the minimum of consecutive specialized work that can be accepted from candidates for the respective degrees. Purely elective courses may be taken by those who do not seek degrees.

For the degree of Bachelor of Letters (English Course) continuous studies running through at least one year will be required in civics, in ancient or modern language, and in science. Similar courses in history, literature and philosophy are recommended. Those who have not previously taken the Latin offered in the Normal Schools, or whose preparation in Latin is insufficient to enter the University classes, will be required to take a two years' course in some foreign language, preferably German or French. Latin cannot be taken, as the University offers no elementary classes in that language. Those who have previously taken Latin, will be expected to take at least an additional year's course in language, preferably Latin, German or French. A continuous two years' course is recommended. Greek may be taken. Three full studies will be required throughout the course, those additional to the above being elective. These may be selected from any of the studies offered by

the University which the student's preparation and the schedule of the recitations permit. Extra studies may be taken by those whose standing and strength justify it.

To attain the degree of Bachelor of Science, three courses of one year each in selected sciences (one of each of the two groups prescribed in the General Science Course, page 93, to be taken), and two courses of one year each in ancient or modern language are required. A course of two years is regarded not only as the equivalent of two courses of one year each, but as generally preferable to the latter, especially in language. Those who have taken no previous classical or foreign language will be required to take two courses of two years each in foreign language. In this case Latin cannot be taken for want of an elementary course. German and French are recommended. In addition to the above requirements, elective studies sufficient to constitute three full studies throughout the course are required.

The regular rhetorical work of the college classes will be required o students in these courses.

Normal graduates who may have a sufficient knowledge of Latin, French or German, in addition to the full acquirements of Normal School graduates, may become candidates for the degree of Bachelor of Letters (Modern Classical Course), in which case they will be permitted to take such sub-courses as will be the nearest available equivalents of those of the Modern Classical Course.

COURSE FOR NORMAL GRADUATES LEADING TO THE DEGREE OF BACHELOR OF LETTERS (ENGLISH COURSE).

JUNIOR YEAR.

I. LANGUAGE (Latin, French or German), pursued continuously throughout the year.

II. CIVICS (Elementary Law, English and American Constitutional Law, Political Economy), pursued continuously throughout the year.

III. SCIENCE (Chemistry, Physics, Mathematics, Astronomy, Botany, Mineralogy or Geology), pursued continuously throughout the year.

IV. ELECTIVES. One or more of the above long courses may be deferred until the Senior year, and elective studies substituted therefor.

V. RHETORICAL WORK, five essays or theses and one oration during the year

SENIOR YEAR.

I. LANGUAGE (Latin, French or German), pursued continuously throughout the year.

II. HISTORY, a course embracing one or more of the following is recommended: History of Modern Institutions, History of Civilization, Dynastic and Territorial History, English Constitutional History, Archæology, advanced American or English History.

III. ENGLISH, elective, a course in English Masterpieces and Early English is recommended to those who chose Latin instead of English Literature in the Normal School course.

IV. CIVICS, the required long course in civics may be taken during this year. Additional elective studies in civics may also be taken.

V. SCIENCE, the required long course in science may be taken during this year. Additional elective studies in science may also be taken.

VI. RHETORICAL WORK, three essays or theses, and one oration are required during the fall and winter terms.

COURSE FOR NORMAL GRADUATES LEADING TO THE DEGREE OF BACHELOR OF SCIENCE.

JUNIOR YEAR.

I. SCIENCE. (1). A continuous course in Chemistry, Physics, Mathematics or Astronomy throughout the year.

(2). A continuous course in Botany, Zoology or Mineralogy throughout the year.

(3). Mineralogy may be taken during the second half of winter term, and through the spring term preparatory to Geology in the Senior year. One of these courses in science may be taken in the Senior year, but if Geology is elected, courses in Chemistry, Mineralogy or Physics, or in Zoology or Botany, should be taken during the Junior year.

II. LANGUAGE (Latin, German or French), pursued throughout the year. Students who chose English Literature in the Normal course will be required to take two courses in language throughout the year.

III. ELECTIVES, if either course in science is deferred until the Senior year, elective studies are to be substituted. Extra elective studies may also be taken by those prepared for them.

IV. RHETORICAL WORK, five essays or theses, and one oration during the year.

SENIOR YEAR.

I. SCIENCE, a continuous study running through the year. If Geology is chosen as one of the three required courses, it should be taken during this year, and be preceded by the two other courses in science.

II. LANGUAGE (Latin, German or French), throughout the year. Students who chose English Literature in the Normal course will be required to take two courses in language throughout the year.

III. ELECTIVE STUDIES, sufficient to make at least three full studies.

IV. RHETORICAL WORK, three essays or theses, and one oration during the fall and winter terms.

SIX-YEAR COURSES.

Those desiring to devote to music, or any similar pursuit, the time of one entire study, will be allowed to take two studies, and thus extend their course over six years.

ELEMENTARY GREEK COURSE.

FALL TERM.

GREEK, subcourse I, Goodwin's Grammar and the exercises for Composition in Harper's Inductive Method, *full study.*

GREEK, subcourse II, Xenophon's Anabasis, *full study.*

LATIN, subcourse I, Cicero's Select Orations, Latin Composition, *full study.*

WINTER TERM.

GREEK, subcourse I, Homer's Iliad, Prosody, Composition, *full study.*

GREEK, subcourse II, Xenophon's Anabasis, Grammatical Exercises, *full study.*

LATIN, subcourse I, Vergil's Æneid, Latin, Prosody, Composition, *full study.*

SPRING TERM.

GREEK, subcourse I, Homer's Iliad, Composition, *full study.*

GREEK, subcourse II, Xenophon's Anabasis, Grammatical Exercises, *full study.*

LATIN, subcourse I, Vergil's Æneid, Composition, *full study.*

FALL TERM, 1891.

	M., W., F.—8—Tu., Thu.	M., W., F.—9—Tu., Thu.	M., W., F.—10—Tu., Thu.	M., W., F.—11—Tu., Thu.	M., W., F.—12—Tu., Th
Prof. Barnes				‡‖Botany 1.	
Prof. Bennett		†Latin 5.	Latin 6. ‡Latin 4.	†*Latin* 3.	
Prof. Birge	Physiology 6. Histology 5.				
Miss Cornelius	Elementary Latin 1.		‡*Latin* 2.		
Prof. Daniells					
Prof. Davies				Mathematical Physics 5.	
Prof. Frankenburger			*§Rhetoric 1.	‡Rhetoric 2.	Rhetoric 3. Dram. Read
Prof. Freeman	Anglo-Saxon 2	English Lit. 5. Shakesp're 10.			
Prof. Frisby	§*Hygiene.*				§*Hygien*
Miss Gay		‡French 1.		French 2.	*§French 3.
Dr. Haskins	History 7. History 9.	§*History* 1. §*History* 2.	§*History* 1. §*History* 2.		History 4.
Prof. Hillyer	Organic Chemistry 2.				
Prof. Hobbs			Metallurgy 1.		
Prof. Hoskins			Analytic Mechanics 3.	Des. Geom. 1.	*Mechanics 2.
Prof. Jastrow			Greek Phil. 6.	¶Psychology 1.	
Prof. Kerr		†*Greek* 3.	†Greek 5 (2 d.) Greek 7.	Elementary Greek 1.	
Dr. Loomis					Physics 2.
Prof. Olson	Norse 3.	§*Norse* 1.		§*German* 5.	Norse 2.
Prof. Owen	French 4. French 5.				
Mr. Palmer	**Elocution.*				†‡*Elocution.*
Prof. Parkinson		†‡§Political Economy 10.	§Elementary Law 1.	Const. Law 4.	
Prof. Rosenstengel		§German 6.	‡German 2.	German Seminary 11.	‡§German 4. ‡§Germa
Prof. Salisbury					Geology 1.
Prof. Slichter		§*Algebra* 1.		‡*Algebra* 1.	Analytic Geometry 5.
Prof. Stearns			Pedagogy 1.	¶Psychology 1.	
Mr. Stempel	†German 10.	‡*German* 1.		§*German* 5.	§*German* 5.
Miss Sterling		*German 9. *German 8.			*German 7.
Prof. Turner			History 8.		History 5.
Prof. Van Hise					Geology
Prof. Van Velzer	Differential Equations 7.	*§Algebra* 1.	†*Algebra* 1.		
Prof. Williams	‖Hebrew 2. ‖Sanskrit 2.	Elementary Greek 2.	‖Hebrew 3 (1 d.) †Greek 5.		‖Hebrew 1. ‖Sanskrit

WINTER TERM, 1892.

Prof. Bennett		†Latin 5.	‡Latin 4. Latin 6.	†*Latin* 3.	
Prof. Birge	Physiology 6. Bacterol'gy 1.				
Prof. Comstock			‡*Latin* 2.		
Miss Cornelius	Elementary Latin 1.				
Prof. Daniells				Mathematical Physics 5.	
Prof. Davies				††Rhetoric 2. Chaucer 3.	Dr. Read.
Prof. Frankenburger			§Rhetoric 4.		Eng. Mast'p'c's 6.
Prof. Freeman		Eng. Lit. 5.			††*Hygien*
Prof. Frisby	**Hygiene.*				*§*French* 3.
Miss Gay		‡French 1.		French 2.	History 4.
Dr. Haskins	History 7. History 9.	§*History* 1.	§*History* 1.		
Prof. Hillyer		Chemistry 2.	Chemistry 2.		Geology
Prof. Hobbs					
Prof. Hoskins			Mechanics 3.		
Prof. Jastrow		Logic 12.			
Prof. Kerr		†*Greek* 3.	Greek 7. Greek 5 (1 d.)	Elementary Greek 1.	
Dr. Loomis			§*Physics 2.		
Prof. Olson	Norse 3.	§*Norse* 1.		§*German* 5.	Norse 2.
Prof. Owen	French 5. French 4.				
Prof. Parkinson	Polit. Econ. 12.	Roman Law 7. Polit. Econ. 11.	Constitutional Law 2.	Comp. Con. L. 6. Am. Con. L. 5.	§*Elocution.*
Mr. Palmer	§*Elocution.*				‡§German 3. ‡§Germa
Prof. Rosenstengel		§German 6.	‡German 2.	German Seminary 11.	Geology 3.
Prof. Salisbury					Calculus 6.
Prof. Slichter		§*Algebra* 2.		‡*Algebra* 2.	
Prof. Stearns		Pedagogy 2. Pedagogy 4.	Psychology 7. Pedagogy 3.	Æsthetics 10.	
Mr. Stempel	†German 10.	‡*German* 1.			§*German* 5.
Miss Sterling		*German 8. *German 9.		§*German* 5.	*German 7.
Prof. Turner			History 8.		History 5. §*History*
Prof. Van Velzer	Differential Equations 7.	*§Algebra* 2.	†*Mathematics* 3.		
Prof. Williams	‖Hebrew 2. ‖Sanskrit 2.	Elementary Greek 2.	†Greek 5 (4d.) Hebrew 3 (1d.)		‖Hebrew 1. ‖Sanskrit

SPRING TERM, 1892.

Prof. Barnes					
Prof. Bennett			‡Latin 4. Latin 6.	†*Latin* 3.	
Prof. Birge	Embryology 7.				
Prof. Bull				Descriptive Geometry 1.	
Miss Cornelius	Elementary Latin 1.				
Prof. Comstock					Astronomy 1.
Prof. Daniells					Chemistry 7.
Prof. Davies				Mathematical Physics 5.	
Prof. Freeman			†‡*Anglo-Saxon* 1.	§Chaucer 4.	American Masterpieces
Miss Gay		‡French 1.		French 2.	*§French* 3.
Dr. Haskins	History 7. History 9.	§*History* 1.	§*History* 1.		History 4.
Prof. Hillyer					
Prof. Hobbs					
Prof. Jastrow		Logic 12. Logic 11.	Psych. 3, 4 or 5.		
Prof. Kerr			Greek 7.	†Greek 5.	Elementary Greek 1.
Dr. Loomis			*Physics 1.		
Prof. Olson	Norse 3.	§*Norse* 1.		§*German* 5.	Norse 2.
Prof. Owen	French 5. French 4.				
Prof. Parkinson	Pol. Econ. 13.	Intern. Law 8.	Constitutional Law 3.	Com'l Law 9.	
Prof. Rosenstengel		§German 6.	‡German 2.	German Seminary 11.	‡§German 3. ‡§Germa
Prof. Slichter		†§*Trigonometry* 4.		‡*Trigonometry* 4.	Calculus 6.
Prof. Stearns		Pedagogy 5. Hist. Art 11.	Pedagogy 6.	Ethics 8.	
Mr. Stempel	†German 10.	‡*German* 1.			§*German* 5.
Miss Sterling		*German 8. *German 9.		§*German* 5.	*German 7.
Prof. Turner					History 5. §*History*
Prof. Van Hise	Geology 5.				
Prof. Van Velzer	Differential Equations 7.	*§*Trigonometry* 4.		†*Trigonometry* 4.	
Prof. Williams	‖Hebrew 2. ‖Sanskrit 2.	Elementary Greek 2.	‖Hebrew 3 (1 d.)	†*Greek* 4.	‖Hebrew 1. ‖Sanskrit

*General Science. †Ancient Classical. ‡Modern Classical. §English. ¶All Courses. Freshman studies in *Italics*, Sophomore in Small Caps. ‖The hours of many

SUBCOURSES.

The general courses of study given above are made up of numerous subcourses, of which brief outlines are here given. The subcourses which are marked as required of certain classes of students are to be understood as elective for all others who are prepared to take them, and who are entitled to make elections.

MENTAL SCIENCE.

PROFESSOR STEARNS AND PROFESSOR JASTROW.

All students in the regular college courses are required to take the equivalent of three terms of philosophic studies, one of which is General Psychology, subcourse I.

Subcourse I, General Pyschology. It is the object of this course to acquaint the student with the problems of mental life, especially such as have a living interest and are susceptible of every-day illustration. Observation of the intellectual operations in the student's own mind is encouraged and an acquaintance with the best literature is furthered. Among the topics introduced are the relations of body and mind; the development of mind in animals; the senses as factors in mental life; the mind in disease, illustrated by the diseases of language, of memory, and of personality; the experimental methods applied to psychic acts; the time relations of mental phenomena; mind in savages; practical applications, especially in the field of education; the laws of association and their consequences; perception; retentiveness; the nature of reasoning; idealization; dreams and illusions; the problem of the nature of knowledge; the emotional nature; the will and action. Five times a week during the fall term. (Professors Stearns and Jastrow.)

Required of all the students in the regular college courses. Elective to students in the engineering and special courses. Recommended for Junior year to students intending to pursue advanced studies in psychology and other philosophical courses.

Subcourse II, Experimental Psychology. An advanced course for students who have completed subcourse I. The methods will be largely those of experiment and observation. One afternoon each week will be given to laboratory exercises or demon-

strations. In addition each student is expected to work upon an experimental topic in connection with the professor or with other students, and to formulate the results obtained in a thesis. The topics covered by the lectures will be chosen from the following: the anatomy and physiology of the nervous system; the location of function in the brain, with consideration of the evidences from comparative anatomy, from experimentation and from pathology; the study of the senses with special reference to physiological optics; the time taken up by elementary mental phenomena; the time-senses; the study of memory and associations; mental statistics; the psychophysic law; psychological theories and so on. The laboratory equipment will be especially directed to the study of the senses, particularly of the tactile and visual senses; to the quantitative relations of sense-impressions as formulated in the psychophysic law; to simple tests illustrating the importance of every-day observation and the application of the statistical method; to the time-relations of mental phenomena, and to the physical indices of psychic activity. This subcourse is counted as a full study when accompanied by laboratory work of sufficient amount and quality. Three times a week, winter term. (Prof. Jastrow.)
Elective.

Subcourse III, Comparative Psychology. The course of mental development along the animal scale forms the chief topic, and in this the works of Romanes will be followed. As far as practicable some form of animal life will be selected for special study and observation will be encouraged. The development of mental faculty in the human infant will be constantly brought in for comparison with the animal development. Once weekly, spring term. (Prof. Jastrow.)
Elective.

Subcourse IV, Morbid Psychology. The chief topics will be the criterion of the normal delusions and hallucinations, the chief forms of mental diseases, the diseases of language, the diseases of memory, the diseases of the will, the diseases of personality; dreams, hypnotism. Once weekly, spring term. (Prof. Jastrow.)
Elective.

Subcourse V, Anthropological Psychology. The development of the human mind in the race, as illustrated by the history of human arts, customs and beliefs. Tylor's Anthropology will be used as a reference book and the topics there treated may be taken as a fair index of the nature of the course. Once weekly, spring term. (Only two of the three subcourses III, IV and V, will be given in any one year.) (Prof. Jastrow.)
Elective.

Laboratory work in psychology is pursued through the entire year and is arranged by conference with Prof. Jastrow.

Subcourse VI, History of Greek Philosophy. A brief survey of the development of philosophical thought in Greece. The deep educational value of this development lies in its completeness and in its many and striking applications to the problems of modern thought. Exercises with occasional reviews. Zeller's Hand-book of Greek Philosophy is the reference book. Special attention will be paid to Plato and Aristotle. Twice a week, fall term. (Prof. Jastrow.)
Elective.

Subcourse VII, The History of Modern English Philosophy. The historical development of the English school of psychology is treated in this course, beginning with Locke, Berkeley and Hume, and sketching the main features of the doctrines of James Mill, John Stuart Mill, Herbert Spencer, Alexander Bain and G. H. Lewes. For the latter part of the course Ribot's English Psychology is in the hands of the students. Three times a week, winter term. (Prof. Stearns.)
Elective.

Subcourse VIII, The Philosophy of Kant. In this course use will be made of Prof. Watson's selections from Kant, which give in the form of extracts from the Critique of Pure Reason, the Metaphysics of Morality, the Critique of Practical Reason and the Critique of Judgment, all the passages essential to the understanding of his philosophy. The students will be expected to work their way, with such assistance as may be given in the class room, to an apprehension of the relations and significance of the chief doctrines of the critical philosophy. This course will be given in 1893, and regularly in alternate years with course VII. (Prof. Stearns.)
Elective to those who have taken subcourse I.

Subcourse IX, Ethics. The aim of this course is to lay a foundation for systematic thought on the problems of morals, and to introduce the student to the literature of the subject. After a brief review of the chief ethical theories, attention is directed to the most significant distinctions of practical ethics, and to the study and discussion of ethical problems. Five times a week, spring term. (Prof. Stearns.)
Elective.

Subcourse X, Æsthetics. In addition to the study of the physiological and psychological basis of æsthetics an elementary knowledge of the history of art and the principles of art criticism is given by lectures and discussions. Five times a week, winter term. (Prof. Stearns.)
Elective.

Subcourse XI, History of Art. A brief course of readings and lectures in the History of Art will be offered in the spring term as supplementary to subcourse X. Special attention will be given to the historic development of sculpture and painting. Twice a week. (Prof. Stearns.) *Elective to those who have taken subcourse X.*

Subcourse XII, Elementary Logic, Deductive and Inductive. The analysis of arguments, the construction and elaboration of syllogisms; the symbolic and diagrammatic methods of representing logical operations, and modern and ancient systems of logic will form the main topics of the deductive logic; while in inductive logic special emphasis will be laid upon the methods of scientific reasoning, the logic of chance, the detection of fallacies, and the estimation of evidence. The exercises will be in the nature of comment and discussion, with abundant practical exercises. Recommended for Junior year to all properly prepared. Daily in winter term. (Prof. Jastrow.)

Subcourse XIII, Advanced Logic. A continuation of subcourse XII. The instruction will be mainly by lectures. Special attention will be paid to the logic of the sciences, following Mill's system of logic; to mathematical logic as introduced by Boole and developed by Venn, Peirce, Schroeder and others; to the theory of probabilities and the history of logical doctrines. Twice weekly, spring term. (Prof. Jastrow.) *Elective.*

Subcourse XIV, Mill's Logic. A general course upon the philosophy of reasoning and the principles of inductive science. Killick's Handbook to Mill's logic will be used and the exercise will be mainly in the nature of discussions. Three times weekly, spring term. (Prof. Jastrow.) *Elective.*

Attention is directed to the fact that students in the regular college courses may now select any fifteen hours of work from the studies enumerated above, irrespective of the term in which the study occurs, provided that subcourse I is included in their selection and that their selection is approved by their class-officer.

PEDAGOGY.

PROFESSOR STEARNS.

Subcourse I, History of Educational Theories and Practices. Lectures five times a week during the first term. Text-books, Browning's History of Educational Theories, Quick's Essays on Educational Reformers, and Boone's Education in the United States.
Elective for all students.

Subcourse II, The Philosophy of Education. A study of the nature, form and limitations of education, and of the psychological basis of methods, with a view to developing a rational criticism of educational plans and processes. Lectures and recitations three times a week during the winter term.

Elective for all students who have taken subcourse I in Mental Science.

Subcourse III, School Law and School Hygiene. Twice a week during the winter term.

Elective for all students.

Subcourse IV, Kindergarten and Primary School. Management and methods. Twice a week during the spring term.

Elective for all students.

Subcourse V, Methods and Management. Developed with special reference to grammar and high school grades. Three times a week during the spring term.

Elective for all students.

Subcourse VI, Seminary. For the discussion of educational problems. Twice a week during the spring term.

Students who have taken subcourse I or subcourse II will be admitted to this exercise.

The first course aims to make the student acquainted with the chief currents of thought on education, and with the most important experiments which have been tried. This, it is believed, furnishes the best possible introduction to the problems of practical pedagogy. Subcourses III, IV and V are practical studies of the actual work undertaken in our graded schools, while subcourse II investigates systematically the principles underlying such work. A year's work in this department is made up of subcourses I, II and V, with either III or IV, as the student may elect.

CIVICS—CIVIL POLITY AND POLITICAL ECONOMY.

PROFESSOR PARKINSON.

The studies in this department may be entered upon at the beginning of the Junior year and continued to the close of the Senior year.

The work consists at present, of the following subcourses:

Subcourse I, Elementary Law. This is a full study through the fall term. It is aimed here to secure a broad, general view of the field of law as a systematic whole, and to acquire some familiarity with its leading principles, especially with the elements of American law, of which no

one who claims its protection or is liable to its penalties, can afford to be entirely ignorant.

Required of Juniors in the English Course.

Subcourse II, English Constitutional Law. During the winter term lectures will be given upon the English Constitution and upon the development of constitutional law and government in the United States prior to the adoption of the present constitution. This is a full study, and designed to trace in outline the growth of the English Constitution from the time of Magna Charta to the present, setting forth its leading principles and distinguishing characteristics, and especially its unwritten growth since the Revolution of 1688.

Required of Juniors in the English Course.

Subcourse III, American Constitutional Law. Subcourse II is designed to prepare the way for a more intelligent study of the present constitutional law of the United States, which is taken up at the beginning of the spring term, and continued, by recitation or lecture, daily to its close. A text-book is here used to guide and steady discussion.

Required of Juniors in the Ancient Classical, Modern Classical and English Courses.

Subcourse IV, American Constitutional Law. Continued twice a week during the fall term. This time is given to a closer examination of the more important parts of the constitution, but especially to a study of the amendments, their nature, scope and influence as a bill of rights. Special attention is given to important cases involving vital principles of constitutional law, and to the decisions upon them by the highest judicial tribunals. It is designed here, and throughout the department of civics, to give instruction that shall be practical to all, in the highest sense of the term, and which shall be of immediate service to that large class of graduates and others who pass at once from the academic to the law department of the University.

Elective for students who have had subcourse III.

Subcourse V, American Constitutional Law. The last three amendments, and the leading judicial decisions bearing upon them. Also a study of the unwritten constitution of the United States. Twice a week during the winter term.

Elective for those who have had subcourse III.

Subcourse VI, Comparative Constitutional and Administrative Law. The constitutions of leading foreign countries. An examination of the salient points in their government and administration. Lectures with collateral reading. Twice a week during the winter term.

Elective for those who have had subcourse II or III.

Subcourse VII, Roman Law. Its outlines. The aim is to trace the important steps in the growth of the Roman law, but to give chief attention to its more modern form, as codified by Justinian, and which underlies the jurisprudence of so many of the leading states of the world. Three times a week during the winter term.
Elective to Juniors and Seniors. Open to graduate students.

Subcourse VIII, International Law. This subject is taught wholly by lectures. These are given twice a week through the spring term. The aim is to present the outlines of the science in as complete a manner as possible in the time allowed, and to note any modifications or advances which may be made from time to time in the recognized law of nations.
Elective in all the general courses. Open to graduate students.

Subcourse IX, Commercial Law. The fundamental principles governing business transactions. This subject is offered for the special benefit of those who intend to enter upon business pursuits. Lectures and recitations. Twice a week during the spring term.
Elective for Juniors and Seniors.

Subcourse X, Political Economy. This subject is taken up at the beginning of the fall term. There are five exercises a week upon the general principles of the science as set forth in the ordinary manuals. A text-book is here used, but is supplemented with occasional lectures. It is designed to treat the science of political economy, not as an isolated one, but as intimately connected with that of government, and as closely bearing upon the welfare and interdependence of states as well as of individuals.
Required of students in the Ancient Classical, Modern Classical and English Courses.

Subcourse XI, Political Economy. Practical applications. The mechanism of exchange—money, credit and banking. Recitations and lectures. Twice a week during the winter term.
Elective for those who have had subcourse X.

Subcourse XII, Political Economy. Practical applications. Lectures, papers and discussions upon the more important topics under exchange and distribution. Among the subjects investigated are: The general theory of exchange, international exchange, balance of trade, rent, interest, profits, wages, trades-unions, strikes, co-operation, profit-sharing and the unearned increment of land. Three times a week during the winter term.
Elective for those who have had subcourse X. Open to graduate students.

Subcourse XIII, Political Economy. Practical applications. Taxation and finance, theories and methods, state and national, with some com-

parison of methods in leading foreign countries. Lectures, papers and discussions. Twice a week during the spring term.
Elective for those who have had subcourse X. Open to graduate students.

Text-books: Robinson's Elementary Law, Cooley's Constitutional Law. Tiedeman's The Unwritten Constitution of the United States, Morey's Outlines of Roman Law, Walker's Political Economy (larger course), Jevon's Money and the Mechanism of Exchange, and Bonamy Price's Currency and Banking.

HISTORY.

PROFESSOR TURNER AND DR. HASKINS.

The method of instruction aims to cultivate the habit of going to the original sources of information in historical study. Students are encouraged to follow out independent lines of investigation, and arrangements have been made by which students so engaged have a seminary room in the library of the State Historical Society, a library of 141,000 books and pamphlets, which in American history has no rival west of the Alleghany mountains.

Students who wish to make a specialty of history should acquire a reading knowledge of French and German as early in their course as practicable.

Subcourse I, Dynastic and Territorial History. The topical method is pursued, with the assistance of historical maps and charts and books of reference. The following books are used: Allen's History Topics, Labberton's Historical Atlas, Myers & Allen's Outlines of Ancient History, Myers' Outlines of Mediæval and Modern History. Three times a week three terms. (Dr. Haskins.)
Required of Freshmen in the English Course.

Subcourse II, English History. The instruction is given by lectures in connection with class work in Gardiner's Student's History of England and the preparation of essays on assigned subjects. Twice a week during the fall term. (Dr. Haskins.)
Required of Freshmen in the English Course.

Subcourse III, General History of the United States. Allen's Topics in connection with lectures and text-books. Twice a week in the winter and spring terms. (Prof. Turner.)
Required of Freshmen in the English Course.

Subcourse IV, General History. 1. For 1891–1892: fall term, primitive, oriental and Greek history; winter term, Roman history; spring term, mediæval history. Text-books: Keary's Dawn of History, Myers'

Eastern Nations and Greece, Oman's Greece, Allen's Rome, Duruy's Middle Ages. (Dr. Haskins.) 2. For 1892–1893: fall term, the Renaissance; winter term, the Reformation; spring term, the Eighteenth Century. (Prof. Turner.)

The method of study is by topics, lectures and text-books. In this subcourse attention is given to economic and social conditions as well as to the field covered by subcourse I. Three times a week through the year, but may be elected by separate terms.

Elective.

Subcourse V, History of the Nineteenth Century. The method of study is by lectures and text-book during the fall and winter terms, and a topical review with especial reference to present conditions in the spring term. Text-books: Müller's Political History of Recent Times, Ely's French and German Socialism, Chisholm's Shorter Commercial Geography. Three times a week through the year. Those electing the study must begin in the fall term. (Prof. Turner.)

Elective.

Subcourse VI, Constitutional and Political History of the United States. The subject is studied by the seminary method, from the original authorities, together with required readings in standard histories. Particular attention is given to the growth of American nationality, and of state and local institutions, and to the development of the constitution by interpretation and by usage. Five times a week through the year. (Prof. Turner.)

Elective for Juniors and Seniors.

Subcourse VII, History of Institutions. Fall term, ancient institutions; winter term, mediæval institutions; spring term, modern institutions. This subcourse consists of lectures on the institutional history the principal continental states, supplemented by assigned readings and exercises in the interpretation of original authorities. Three times a week through the year. (Dr. Haskins.)

Elective for students who have had a suitable preparation.

Subcourse VIII, History of Society. In the fall term, primitive society and classical civilization. In the winter term, modern civilization. The method is by lectures and required readings. Twice a week in the fall and winter term. (Prof. Turner.)

Elective for students who have had a suitable preparation.

Subcourse IX, English Constitutional History. Lectures, text-books, topics and required readings. Twice a week for the year. (Dr. Haskins.)

Elective. May be substituted by English Juniors for subcourse II under Civics.

Subcourse X, Advanced English History. This subcourse is devoted to the study of English history since 1688, with special reference to economic history and the history of political parties. The method of study is by assigned readings, oral reports and essays involving the use of original authorities. Twice a week during the winter term. (Dr. Haskins.) (Omitted in 1891–92.)

Elective for students who had subcourse II or an equivalent.

Subcourse XI, Seminary. The work ranks as a two-fifths study and is open to qualified students who desire to do original investigation. The seminary meets once a week in its rooms at the State Historical Society Library. (Prof. Turner and Dr. Haskins.)

GREEK.

PROFESSOR KERR AND PROFESSOR WILLIAMS.

Subcourse I, Grammar, Prose Composition, Homer. Designed for students who desire to begin the Greek language, or to review its fundamental principles; especially arranged to meet the wants of Ancient Classical Freshmen who enter the University with advanced standing in other studies, but with inadequate preparation in Greek. It embraces a study of Goodwin's Greek Grammar, Greek Composition and three books of Homer's Iliad. Five exercises a week one year. (Prof. Kerr.)

Open to first and second year special students and to undergraduates in any of the regular courses in which Greek is either elective or required.

Subcourse II, Xenophon's Anabasis, Translation. Special drill in writing paradigms, and oral exercises in Greek syntax.

This can be taken with or independently of subcourse I. Adapted, as I, for beginners, or for those who have some knowledge of the language but wish to make a thorough review of the essentials of Attic prose. It includes the study of three books of the Anabasis. Special attention given to the analysis of the text, and to the geographical and historical references. Five times a week for one year. (Prof. Williams.)

Elective.

Subcourse III, Lysias, Homer. Five orations of Lysias, two books of Homer's Odyssey, Sidgwick's Greek Prose Composition, five times a week during the fall and winter terms. (Prof. Kerr.)

Required of Freshmen in the Ancient Classical Course.

Subcourse IV, Homer's Odyssey. Two books; three times a week, spring term. (Prof. Williams.)

Required of Freshmen in the Ancient Classical Course.

Subcourse V, Herodotus, Lyric Poets. Book VII of Herodotus, both in prepared lessons and at sight. Selections from the Lyric Poets. Twice a week, fall term; once a week, winter term; five times a week, spring term. (Prof. Kerr.)
Required of Sophomores of the Ancient Classical Course.

Subcourse VI, Demosthenes, Euripides. The Olynthiacs of Demosthenes, the Medea of Euripides. Three times a week, fall term; four times a week, winter term. (Prof. Williams.)
Required of Sophomores of the Ancient Classical Course.

Subcourse VII, Plato's Apology, Crito, Phaedo and Protagoras This course is changed every year. Twice a week, fall term; three times a week, winter and spring terms. (Prof. Kerr.)
Elective for students who have completed the required Greek of the Freshman and Sophomore years.

Subcourse VIII, Derivation of Technical Terms. Practice in the inflection and formation of words and in elementary composition. Designed to aid students of other departments in the mastery of technical terms of Greek derivation. One-fifth study, winter and spring terms. (Prof. Kerr.)
Elective.

Subcourse IX, New Testament Greek. Reading of the Gospel and Epistles of John, the peculiarities of New Testament grammar and diction. Twice weekly, three terms. (Prof. Williams.)
Elective.

Subcourse X, Greek Seminary. Textual criticism and interpretation of the Bacchantes of Euripides. Papers upon the antiquities, mythology and literature of the play. Once a week during the year. (Prof. Kerr.)

Subcourses III, IV, V and VI are required of candidates for the degree of Bachelor of Arts; elective for other students.

LATIN.

PROFESSOR BENNETT AND MISS CORNELIUS.

Subcourse I, Cicero, Vergil. Cicero's Orations (four), Vergil's Æneid (six books), Latin Composition; five exercises a week during the year. (Miss Cornelius.)
Required of members of the Greek Class; elective for Freshmen of suitable preparation in the English Course.

Subcourse II, Livy, Cicero. Livy, Book I, Cicero de Senectute, Latin Composition and reading at sight, Roman History in the Epoch Series; five exercises a week during the fall and winter terms. (Miss Cornelius.)
Required of Freshmen in the Modern Classical Course.

Subcourse III, Livy, Cicero. Livy, Book I, Cicero de Senectute and Select Epistles, Latin Composition and reading at sight, Roman History in the Epoch Series; five exercises a week during the fall and winter terms and two exercises a week during the spring term. (Prof. Bennett.)
Required of Freshmen in the Ancient Classical Course; elective for Sophomores of suitable preparation in the English Course.

Subcourse IV, Horace, Terence. Horace's Odes, Satires and Epistles, Terence's Andria, Roman History in the Epoch Series; two exercises a week during the fall term and three exercises a week during the winter and spring terms. (Prof. Bennett.)
Required of Sophomores in the Modern Classical Course.

Subcourse V, Horace, Plautus, Tacitus. Horace's Odes, Satires and Epistles, Plautus' Mostellaria, Tacitus' Germania and Agricola, Latin Composition and reading at sight, Roman History in the Epoch Series; five exercises a week during the year.
Required of Sophomores in the Ancient Classical Course.

Subcourse VI, (a) Terence's Adelphœ and Plautus' Menæchmi; (b) Pliny's Letters; (c) Lectures on the Private Antiquities of the Romans and the Architectural Remains of the City of Rome, illustrated by lantern views; three times a week in the fall term and twice a week in the winter and spring terms. (Prof. Bennett.) Omitted in 1891–92; will be given in 1892–93.
Elective for Juniors and Seniors in the Ancient and Modern Classical Courses.

Subcourse VII, (a) Lucretius, Books I, III, V; (b) Juvenal and Persius; (c) Lectures on the History of Roman Literature, with Quintilian, Book X, and direction of the student's private reading. (Prof. Bennett.)
Elective for Juniors and Seniors in the Ancient and Modern Classical Courses.

Subcourse VIII, Latin Seminary. Text Criticism of Tacitus's Dialogus de Oratoribus. This course is intended chiefly for graduate students, but will be open to others with the consent of the instructor. The work will be accompanied by the presentation of papers on special topics; one meeting weekly of an hour and a half, counting as two hours. (Prof. Bennett.)

Subcourse IX, Latin Philology. Sounds, inflections and syntax of the Latin language from the comparative standpoint, with extracts from

Aulus Gellius and Quintilian; twice a week throughout the year. (Prof. Bennett.)

Subcourse X, Teachers' Course. Methods of teaching Latin in preparatory schools; one exercise a week during the spring term. (Prof. Bennett.)

SANSKRIT.

PROFESSOR WILLIAMS.

Subcourse I, Perry's Sanskrit Primer and Whitney's Grammar, twice weekly during the year.

Elective.

Subcourse II, Reader, the selections of Laman's Reader, twice weekly during the year.

Elective.

SEMITIC LANGUAGES.

PROFESSOR WILLIAMS.

Subcourse I, Hebrew, Genesis i-viii, and with these chapters the leading grammatical principles of the language, Pentateuchal poetry, twice weekly during the year.

Elective.

Subcourse II, Hebrew, Linguistic Interpretation of parts of Samuel, Isaiah and the Psalms; twice weekly during the year.

Elective.

Subcourse III, Hebrew Syntax, recitations and lectures; once weekly during the year.

Elective.

Subcourse IV, History of Israel, twice a week during the winter and spring terms.

Elective for all students whether they have pursued the study of the Semitic languages or not.

Instruction is offered in Assyrian (selections in cuneiform text and Lyon's Assyrian Manual) and in Arabic (portions of the Kuran and Lansing's Arabic Manual) if desired by a sufficient number of students to justify it.

FRENCH.

PROFESSOR OWEN AND MISS GAY.

It is intended to give to the study of this language disciplinary as well as practical value, thus affording to such as have not studied Latin or Greek a substitute, so far as possible, for the mental training obtained by the study of those languages. It is believed that in carrying out this plan there is little, if any, sacrifice of practical acquisition. To avoid

such sacrifice, the disciplinary (a) and the more practical work (b) have, as far as possible, been separated. The former (a), embracing the treatment of that in which the student requires aid, is allowed to occupy the whole of the recitation hour, which is accordingly occupied, after the first term, with the reading of difficult authors, study of syntax, translation into French and lectures on the French language and literature. The latter (b), consisting of reading so adapted to the student's progress as always to be comparatively easy, is done by students for examination, independently, except for the aid furnished by notes upon the books selected and for the opportunity given to all to ask questions on passages not completely understood. An effort has been made to select for this independent reading works not only of reputation, but of interest, the last quality being an important aid to the student in the performance of his task.

The department maintains two advanced and three elementary subcourses, the latter being differentiated to meet the wants of the different grades of students to whom they are offered.

Subcourse I, Elementary for Modern Classical Students. Otto's French Conversation Grammar, Roman d'un Jeune Homme Pauvre, La Petite Fadette (the former read mainly and the latter altogether independently of the classroom), Le Cid, Le Misanthrope, Athalie. Five exercises weekly throughout the year. (Miss Gay.)

This course or its equivalent is required of Modern Classical Sophomores and of all students who elect subcourses IV or V; it is also a general elective.

Subcourse II, Elementary for Ancient Classical Students. The same as subcourse I, with the addition of lectures on the history of the French Language, consideration of Latin etymologies and treatment of the subject generally from the standpoint of the classics. Additional material for translation will be assigned as the progress of the class allows. Five exercises weekly throughout the year. (Miss Gay.)

Elective for Ancient Classical Seniors and Juniors and for all students whose knowledge of Latin is deemed sufficient.

Subcourse III, Elementary for Scientific Students. The same as subcourse I, but with the omission of such portion (usually Athalie and Petite Fadette) as the needs of the class suggests. Five exercises weekly throughout the year. (Miss Gay.)

This course is a general elective, but is especially arranged for students of the General Science Course during the Sophomore year. It is alternative with other languages to students of the Civil, Mechanical, Mining, Metallurgical, Railroad and Electrical Engineering, English and Agricultural Courses.

As many students desire a reading knowledge only, the effort of the above elementary courses is concentrated upon reading. Students are expected at the end of any elementary course to read with sufficient ease and accuracy to make a practical use of French text-books in the prosecution of their other studies.

Subcourse IV, Advanced. Written translation into French of the English exercises in Otto's Grammar, lectures in French on the history of the language, reading of Cinq Mars independently for examination; three exercises weekly during the fall term, and two exercises weekly during the winter and spring terms. (Prof. Owen.)

Elective for students who have taken subcourse I or its equivalent. Alternative with other languages in certain courses.

An additional exercise weekly is given to reading and speaking French. This exercise is optional and no preparation is prescribed. So far as practicable, French is made the means of instruction.

Subcourse V, Advanced. Oral translations into French of Howard's Aids to French Composition, and recitations in French from Demogeot's History of French Literature, lectures in French on the early literature of the language, reading of Ursule Mirouet and les Travailleurs de la Mer independently or examination, two exercises weekly during the fall term and three exercises weekly during the winter and spring terms. (Prof. Owen.)

Elective for students who have taken subcourses I and IV, or their equivalents.

An additional exercise weekly is given to speaking French. This exercise is optional and no preparation is prescribed. Students, however, at their option, investigate special subjects and present them to the class in French.

So far as possible French is made the medium of instruction. Students are expected at the end of subcourse V to express themselves with ease in writing or in speaking.

Students contemplating the election of subcourses IV or V as an extra study are recommended to prepare the outside reading during the preceding summer vacation, thus lessening by half the work of each term of the course.

SPANISH.

PROFESSOR OWEN.

Subcourse I, Elementary. Translation into English of the Spanish exercises in Sauer's Conversation Grammar and of Castelar's Historia

del año 1883, half study for the year. The distribution of the hours throughout the year will be influenced by considerations of convenience.

General Elective, but especially adapted to the interests of advanced students in French, as these can take it to the best advantage. It is assumed that students in this course have received the disciplinary training of French or other languages. The aim of the course will accordingly be the rapid acquisition of the power of intelligent reading. The recitation hour will be largely devoted to translation for the students of the succeeding day's lesson with comments on syntactical and other difficulties. With such help students obtain the power of independent reading at the end of one year. It is believed that advanced French students will make essentially the same progress as in the elementary year of French.

This course will be given only every other year, beginning in 1887.

ITALIAN.

PROFESSOR OWEN.

Subcourse I, Elementary. Translation into English of the Italian Exercises in Sauer's Conversational Grammar, and of Manzoni's I Promessi Sposi, half study for the year. This course is in general like that in Spanish, with which it alternates, beginning in 1888.

GERMAN.

PROF. ROSENSTENGEL, MISS STERLING, MR. STEMPEL AND PROF. OLSON.

Subcourse I, Reading, Writing, Conversation. Reading, together with a review of grammar, exercises in writing, and, above all, practice in conversing in German. Five exercises a week during the year. (Mr. Stempel.)

Required of Freshmen of the Modern Classical Course.

Subcourse II, Reading, Writing, Conversation, continued. Three exercises a week in the fall term, and two exercises a week in the winter and spring terms. (Prof. Rosenstengel.)

Required of Sophomores of the Modern Classical Course.

Subcourse III, German Classics. Wilhelm Tell, Hermann and Dorothea, and Nathan der Weise. Two exercises a week in the fall term, and three exercises a week in the winter and spring terms. (Prof. Rosenstengel).

Elective for Juniors of the Modern Classical and English Courses.

Subcourse IV, German Classics and Lectures. Maria Stuart, Faust and lectures on the principal periods of German literature, and on the

most important German classics. Three exercises a week in the fall term, and two exercises a week in the winter and spring terms. (Prof. Rosenstengel.)

Elective for the Seniors of the Modern Classical and English Courses.

Subcourse V, Grammar, Reading, Conversation. Thorough drill in grammar, reading, translating, writing, and practice in conversation. Five exercises a week during the year. (Prof. Olson.)

No previous study of German required.

Alternative with French, Latin or Norse for Freshmen of the English Course.

Subcourse VI, Reading, Writing, Conversation. Subcourse V, continued. Five exercises a week during the year. (Prof. Rosenstengel.)

Alternative with French, Latin or Norse for Sophomores of the English Course.

Subcourse VII, Reading, Translating. Reading, together with a review of grammar, translating and reading of Einfuehrung in die Naturwissenschaften. Five exercises a week during the year. (Miss Sterling.)

Required of Freshmen of the General Science and Engineering Courses.

Subcourse VIII, Naturwissenschaftliche Elementarbuecher. Die Bakterien, Goethe's Naturwissenschaftliche Arbeiten, and Chemie. Two exercises a week in the fall term, and three exercises a week in the winter and spring terms. (Miss Sterling.)

Required of those Sophomores or Juniors of the General Science Course who do not elect French as a long course.

Subcourse IX, Prose Selections, Heine's, and Goethe's Prosa, and Schiller's Historische Skizzen. Three exercises a week in the fall term, and two exercises a week in the winter and spring terms. (Miss Sterling.)

Elective for Sophomores of the General Science Course.

Subcourse X, Grammar, Reading, Translating. Five exercises a week during the year. (Mr. Stempel.)

Elective for Juniors and Seniors of the Ancient Classical Course.

Subcourse XI, Seminary. German composition; reading and interpretation of classical works. Three times a week during the year. (Prof Rosenstengel.)

Elective for advanced students.

Subcourse XII, Pedagogical Seminary. Theory of teaching German, and practice in teaching. Once a week during the spring term. (Prof. Rosenstengel.)

Elective for advanced students.

SCANDINAVIAN LANGUAGES.

PROFESSOR OLSON.

This department offers facilities for acquiring a knowledge of all of the Scandinavian languages (Norse, Danish, Swedish and Old Norse or Icelandic). Sufficient knowledge of Modern Norse can be acquired from one year's instruction to enable the student to read both Norwegian and Danish authors, as Norway and Denmark have substantially the same literary language. After having obtained a reading knowledge of Norse, the student will find but little difficulty in reading Swedish. A part of one of the courses offered is devoted to studying some of the gems of Swedish poetry.

The principal object of subcourse I is to give students a reading knowledge of Norse — such a knowledge as will enable them to appreciate the literary value of the works read during the year. The instructional methods used aim to make the work of both disciplinary and practical value.

Subcourse II is essentially a literary one. The works studied are of acknowledged intrinsic merit and high excellence of literary style. The course is adapted for students that have completed the elementary course, and for Norse-Americans who already have a reading knowledge of the language.

Subcourse III is especially planned for Norse-Americans who desire more practice in speaking and writing than can be offered in subcourses I and II. The exercises are conducted in Norse. A critical study of the grammar and orthography of the language is made, so as to give students a good foundation for a correct use of the language. This course alternates with subcourse IV.

The work in Modern Norse (subcourses I and II) serves as a foundation for the study of Old Norse. From the work in subcourse IV the student will obtain a reading knowledge of Old Norse, and some familiarity with early Scandinavian history, and will also be enabled to judge for himself as to the historical worth and literary merit of the Sagas. Some lectures on Scandinavian history, literature and mythology are delivered during the spring term of this course.

Subcourse I, Modern Norse, Elementary. *First term:* Grammar and reader, and selections from Norse folk-lore stories. *Sceond term:* Tegnér's Frithiof's Saga (Monsen's translation), and Henrik Ibsen's Terje Vigen. *Third term:* Selections from Björnson's shorter stories and poems. Five exercises a week during the year.

Alternative with German, French or Latin for Freshmen and Sophomores of the English Course, and with French of the Modern Classical Course; also a general elective.

Subcourse II, Modern Norse, Advanced. *First term:* Alexander Kielland's Skipper Worse. *Second term:* Henrik Ibsen's Brand. *Third term:* Jonas Lie's Den Fremsynte, and selections in Swedish from Runeberg and Tegnér. Five exercises a week during the year.

A continuation of subcourse I for the English Course, and the first years' work for Norse-Americans.

Subcourse III, General Survey of Scandinavian Literature. Seip and Broch's Literaturhistorie, Hofgaard's Grammatik, and Aars' Retskrivningsregler. Three exercises a week during the fall term, and two during the winter and spring terms.

Elective for students that have completed subcourse II.

Subcourse IV, Old Norse or Icelandic. Vigfusson and Powell's Icelandic Prose Reader is used throughout the year. Selections in poetry are also read. Two exercises a week through the year.

Elective for Seniors.

The Scandinavian department of the University library affords excellent advantages to students pursuing these studies.

ENGLISH LANGUAGE AND LITERATURE.

PROFESSOR FREEMAN.

Subcourse I, Anglo-Saxon. Five exercises a week during the spring term. Sweet's Anglo-Saxon Reader.

Required of Ancient and Modern Classical Freshmen, and elective for Freshmen in the English Course.

Subcourse II, Advanced Anglo-Saxon. Two exercises a week during the fall term.

Elective for Ancient and Modern Classical and English Sophomores.

Subcourse III, Chaucer's The Parlament of Foules and Earle's Philology of the English Tongue. Two exercises a week during the winter term.

Required of English and elective for Ancient and Modern Classical Sophomores.

Subcourse IV, Chaucer's Canterbury Tales. Five exercises a week during the spring terms.

Required for English and elective for Ancient and Modern Classical Sophomores.

Subcourse V, General Survey of English Literature. Three exercises a week during fall and winter terms.

Required of Ancient and Modern Classical Juniors. English Juniors are required to pursue a similar course before entering college. If they have not done so, this course is required of them.

Subcourse VI, Seminary in English Masterpieces. Sir Thomas More's Utopia, Roger Ascham's Schoolmaster, Sir Philip Sidney's Defense of Poetry, Spenser's Faery Queen, Bacon's Essays, Milton's Areopagitica, Pope's Essay on Man, Burke's French Revolution, Tennyson's Princess, full study during the winter term. (1891–2.) This course may be offered in the fall term of 1891, if desired.
Elective for Juniors and Seniors.

Subcourse VII, American Masterpieces. The poems of Bryant, Longfellow, Whittier, Holmes and Lowell, five exercises a week during the spring term. (1891–2.)
Elective for Juniors and Seniors.

Subcourse VIII, Seminary in English Masterpieces. The Shakespeare course: Midsummer Night's Dream, Richard III, Merchant of Venice, Henry IV, Parts I and II, As You Like It, Twelfth Night, Hamlet, Othello, Macbeth, The Tempest; full study during the winter term. (1890–1.)
Elective for Juniors and Seniors.

Subcourse IX, American Masterpieces. The prose writings of Hawthorne, Irving, Lowell, Thoreau and Emerson, five exercises a week during the spring term. (1890–1.)
Elective for Juniors and Seniors.

Subcourse X, Preliminary Shakespeare Course. Corson's Introduction to Shakespeare; two exercises a week during the fall term. (1892.)
Elective for Juniors and Seniors.

Subcourse XI, Nineteenth Century Writers. Carlyle, Ruskin, Browning, Dickens, Thackeray, George Eliot.
Elective for Juniors and Seniors. This course was given in the spring term, 1889, and will be given as occasion offers.

Two out of the four subcourses VI, VII, VIII and IX, are required for graduation in the English Course.

Subcourses VI and VIII, VII and IX are given in alternate years; VIII and IX will be given in 1891, VI and VII in 1892.

RHETORIC AND ORATORY.

PROFESSOR FRANKENBURGER, MR. KNOWLTON, MR. PALMER, MR. CAIRNS AND MISS FLESH.

Subcourse I, Principles of Rhetoric. Genung's Practical Rhetoric and Rhetorical Analysis, five exercises a week during the fall term. (Prof. Frankenburger.)
Required of Sophomores in the General Science and English Courses.

Subcourse II, Genung's Practical Rhetoric and Rhetorical Analysis, twice a week in fall term and three times a week during winter term. (Mr. Knowlton.)
Required of Sophomores in the Ancient and Modern Classical Courses.

Subcourse III, Philosophy of Rhetoric. D. J. Hill's Science of Rhetoric, three times a week during the fall term. (Prof. Frankenburger.)
Elective for students who have had subcourse I or II.

Subcourse IV, Nichols' Manual of English Composition and Genung's Rhetorical Analysis, three times a week during the winter term. (Prof. Frankenburger.)
Required of Sophomores in the English Course. Elective for students who have had subcourse I or II.

Subcourse V, Practical Rhetoric. A. S. Hill's Principles of Rhetoric and Nichols' Manual of English Composition, with lectures, three times a week during the fall term and twice a week during the winter term. (Prof. Frankenburger.)
Required of Freshmen in the Engineering Courses.

Subcourse VI, Elocution. Macbeth, Julius Caesar and Othello, with lectures, and Bell's Elements of Elocution, twice a week, fall and winter terms. (Prof. Frankenburger.)
Elective for students who have had subcourse I or II.

Subcourse VII. Rhetorical Exercises. Freshman Year. Elocution, instruction and drill, three times a week during fall or winter term, and two declamations each term. (Mr. Palmer and Miss Flesh.) Lectures on methods of writing clearly; one essay each term. (Mr. Cairns.) Each division meets one hour a week for declamations and for reading of essays and criticism, and three hours a week for one term for elocution. Declamations rehearsed before delivery. Essays criticized and carefully rewritten.
Required in all the courses.

Sophomore Year. Two essays and one declamation each term are required in all the courses. (Mr. Knowlton and Mr. Cairns.)

Junior Year. Six exercises — five essays and one oration — during the year are required in all the courses. (Prof. Frankenburger, Mr. Knowlton and Mr. Cairns.)

Senior Year. Two exercises — one essay and one oration — during the fall and winter terms are required in all the courses. (Prof. Frankenburger.)

Students write a portion of the time upon assigned themes. In addition to the above class exercises there are general rhetorical exercises in each term. At these exercises are given those orations of the Juniors

and Seniors and those essays and declamations of the Freshmen and Sophomores which possess special merit. Besides the instruction in elocution given to the Freshmen, special classes are formed for the Sophomores, Juniors and Seniors, meeting once a week.

This department is supplemented by work in the literary societies, six in number, two maintained by the young women, and four by the young men.

MATHEMATICS.

PROFESSOR VAN VELZER AND PROFESSOR SLICHTER.

Subcourse I, Algebra. Students having previously studied through quadratics in some elementary book are prepared to begin with the general theory of quadratic equations and quadratic functions, and from this point the course includes progressions, arrangements and groups (permutations and combinations), binomial theorem, the theory of limits, undetermined co-efficients, derivatives, series and logarithms. The text-book used is Van Velzer and Slichter's University Algebra. Five exercises a week during the fall term. (Prof. Van Velzer and Prof. Slichter.)

Required of Freshmen in all courses.

Subcourse II, Algebra. This course includes imaginaries (treated by modern methods giving geometric constructions), discussion of rational integral functions of one variable (topics usually treated under the head of theory of equations) solution of numerical equations of higher degrees, graphic representation of equations and determinants. The text-book used is Van Velzer and Slichter's University Algebra. Five exercises a week during the winter term. (Prof. Van Velzer and Prof. Slichter.)

Required of Freshmen in General Science, English and Modern Classical Courses.

Subcourse III, Solid Geometry. The theorems and problems usually given in solid geometry (including spherical), and a few original exercises and practical applications. The text-book is Wentworth's (Revised Edition). Five exercises a week during the winter term. (Prof. Slichter.)

Required of Freshmen in Ancient Classical Course.

Subcourse IV, Trigonometry. In this course the ratio system is exclusively used. The greater part of the term is devoted to plane trigonometry, special stress being laid on goniometry. Spherical trigonometry occupies the last three or four weeks of the term. Text-book: Van Velzer and Slichter's Trigonometry and Mathematical Tables. Five exercises a week during the spring term. (Prof. Van Velzer and Prof. Slichter.)

Required of Freshmen in Ancient Classical, Modern Classical, General Science and English Courses.

Subcourse V, Analytic Geometry. This course includes the straight line, conic sections, general equation of the second degree, curves of higher degrees, transcendental curves, and an introduction to geometry of three dimensions. Five exercises a week during the fall term. (Prof. Slichter.)

Required of Sophomores who intend to take advanced physics or astronomy, elective for all others who have taken subcourse IV.

Subcourse VI, Calculus. Two term course. The calculus is founded on the method of limits. In the winter term the leading subjects treated are differentiation of explicit and implicit functions, expansion of functions in series, indeterminate forms, maxima and minima; in the spring term there is a thorough drill in elementary integration and the integration of different classes of integrable functions, followed by applications to lengths of curves, areas of curves and surfaces, volumes of solids, etc. Five exercises a week during the winter and spring terms. (Prof. Slichter.)

Required of Sophomores who intend to take advanced physics or astronony, elective for all others who have taken subcourse V.

Subcourse VII, Differential Equations. Solution of various forms of total differential equations of the first order and degree, integrating factors, singular solutions with geometrical applications, equations of higher order and degree, partial differential equations, symbolic methods. Text-book: Johnson's Differential Equations. Five exercises a week during the winter and spring terms. (Prof. Van Velzer).

Elective for all students who have taken subcourse VI.

Subcourse VIII, Modern Geometry. Trilinear and tangential co-ordinates, pole and polar and reciprocal polars. Works of reference are Salmon's Conic Sections, Whitworth's Trilinear Co-ordinates and Ferrers' Trilinear Co-ordinates. Three exercises a week during the winter term. (Prof. Van Velzer.)

Elective for all students who have taken subcourse V.

Subcourses IX to XVI, Special Advanced Electives. Courses varying from year to year are offered in the following subjects: IX, Higher Plane Curves; X, Analytic Geometry of Three Dimensions; XI, Spherical Harmonics; XIII; Elliptic Functions; XII, Theory of Functions; XIV, Theory of Numbers, XV, Quantics; XVI, Quaternions.

ASTRONOMY,

PROFESSOR COMSTOCK.

Subcourse I, Descriptive Astronomy, This course consists of recitations, five hours a week during the spring term, supplemented by

visits to the Washburn Observatory for the inspection of astronomical instruments and the examination of the principal heavenly bodies. Text-book: Newcomb and Holden's Astronomy, Advanced Course, American Science Series.

Required of students in the General Science Course. Elective to Sophomores, Juniors and Seniors in other courses.

Subcourse II, Astronomical Practice. This is a course designed to give to engineering students and others, some training in the theory and use of instruments of precision, and to familiarize them with the more important practical applications of astronomy, such as the determination of time, latitude, longitude and the direction of the meridian. In this connection attention is paid to methods of computation and the numerical treatment of observed data. The necessary theoretical introduction to the work is given during the winter term. This is followed in the spring term by practice in the use of instruments and in the reduction and discussion of observations. The time given to this study is two consecutive hours, three times a week.

Required of students in the Civil Engineering Course, and elective in the General Science, Mechanical, Mining and Railroad Engineering Courses.

Subcourse III, Theoretical and Practical Astronomy. This is a long course in astronomy, extending over three terms. The instruction in theoretical astronomy will include the determination of orbits and computation of ephemerides of comets and planets. Under practical astronomy will be included instruction in the theory and use of the sextant, altazimuth, transit instrument and zenith telescope, with such other instruments as the prescribed limits of time may allow. Each student will be assigned some problem requiring the execution and discussion of an extended series of observations with some one or more of the instruments of the Observatory, and the presentation of his results in the form of a thesis will be required. It is not probable that the whole of the work thus outlined can be completed by the average student in a single year, but such selections will be made from it as seem best adapted to the requirements of individual cases. In place of the theoretical astronomy outlined above there may be substituted an equivalent amount of work in the history of astronomy and the development of the modern astronomical physics. Students pursuing this course will have access to and free use of the excellent Woodman Astronomical Library, and will be directed to, and aided in the use of the standard astronomical text-books and memoirs as sources of information.

Subcourse III may be elected by any student who has obtained credit for subcourse I in astronomy and for two terms of calculus, but all

students electing this study are advised to take the course in analytical mechanics concurrently with it, if that course has not previously been taken.

The Students' Observatory and the minor instruments of the Washburn Observatory furnish excellent facilities for astronomical study and practice. The instruments available for the use of students comprise a 3-inch combined zenith telescope and transit instrument by Fauth & Co.; two Spencer & Browning sextants; Fauth theodolite and chronograph; Bamberg universal instrument; and mean time and sidereal chronometers.

Post-graduate students will be received in the Washburn Observatory as assistants, and will take part in the regular series of observations with the large equatorial telescope, or with the meridian circle, at the same time continuing their theoretical studies. Facilities for independent original work will be afforded to such students, and their work, if of sufficient importance, will be printed in the *Publications of the Washburn Observatory*. Seven volumes of these publications, representing the work of the Observatory prior to 1890, have already been issued.

The Observatory is open to visitors on the first and third Wednesday of each month, from 7:30 to 9:30 P. M., if the evenings are clear. Students of the University who are interested in astronomy are invited to come at these times.

PHYSICS.

PROFESSOR DAVIES AND DR. LOOMIS.

Subcourse I, Experimental Lectures in General Physics. Short Course. This is intended for students in the Ancient and Modern Classical Courses. No previous knowledge of physics is required. Instruction is given by lectures accompanied by written and oral recitations. Students are from time to time required to submit in writing solutions of simple problems involving the principles laid down in the lectures. These papers are carefully corrected and returned. Daily exercises through the fall term.

Subcourse II, Elementary Long Course. This is intended for students in the Engineering and General Science courses, and is required of them. A previous knowledge of Physics, equivalent to that required for admission, is necessary. The method of instruction is the same as outlined for Subcourse I. Daily exercises through the winter and spring terms.

Subcourse III, Laboratory Work in Electricity, Magnetism, Sound and Light. This course is begun only upon the completion of Subcourse II. It consists of experimental work such as is laid out in Stewart and Gee's Practical Physics, Kohlrausch's Physical Measurements, Glazebrook and Shaw's Practical Physics, and similar works. The time required is ten hours' laboratory work per week during the Junior year, with attendance

upon such occasional lecture-room illustrations as the professor of physics may deem necessary for the student's guidance in his experimen tal work.

Subcourses II and III are required of all students taking the so-called long course in physics.

Subcourse IV, **Advanced Laboratory Work.** Special laboratory work in electrical testing and the principles of electrical enginering, or advanced work in heat, light and sound for those students who prefer it. Ten hours per week. This course is elective, but when elected must be completed.

Subcourse V, **Mathematical Physics.** A course for advanced students, during the Senior year, consisting of recitations from Lamb's Theory of Fluid Motion, or Minchin's Uniplanar Kinematics of Solids and Fluids, Rayleigh on Sound, Glazebrook's Physical Optics, Clerk Maxwell on Electricity and Magnetism.

This course can be continued as a post-graduate course.

For special electrical course, see Electrical Engineering.

CHEMISTRY.

PROFESSORS DANIELLS AND HILLYER.

Subcourse I, consists of a daily exercise throughout the year, as follows: 1, **Descriptive Inorganic Chemistry,** lectures and laboratory practice for thirteen weeks. (Prof. Daniells.) 2, **Qualitative Analysis,** for eleven weeks. (Dr. Hillyer.) 3, **Quantitative Work** in the determination of the equivalence of elements, four weeks. (Prof. Daniells.) 4, **Descriptive Organic Chemistry,** lectures and laboratory practice nine weeks. (Dr. Hillyer.)

Elective.

Subcourse II, 1, **Descriptive Inorganic Chemistry.** Lectures and laboratory practice daily during the fall. (Prof. Daniells.) 2, **Qualitative Analysis.** Twice a week during the winter and spring terms. (Dr. Hillyer.)

Required of all Scientific and Engineering Sophomores.

Subcourse III, 1, **Descriptive Organic Chemistry.** Lecturers and recitations, and laboratory work daily during the first half of the fall term. (Dr. Hillyer.) 2, **Quantitative Experiments** in Inorganic Chemistry, daily during the last half of the fall term, and **Quantitative Analysis** daily during the winter term. (Prof. Daniells.) 3, **Advanced Organic Chemistry.** Laboratory work in the preparation of typical organic compounds and ultimate analysis daily during the spring term or any subsequent term. (Dr. Hillyer.) Or a continuation of Quantitative Inorganic Analysis. (Prof. Daniells.)

Elective for all students who have completed Subcourse II.

Subcourse IV, Elective Advanced Course. Students may elect chemistry as a full study for the winter and spring terms of the Sophomore year, and continue the study during the Junior and Senior years. The methods followed will be in general the same as those laid down in subcourses I and III, until suitable proficiency is acquired, when each student may follow any special line of work desired, either in organic or in inorganic chemistry, or in both; descriptive organic chemistry being given in the fall term as well as in the spring term.

Subcourse V, Metallurgical Course in Chemistry. Students in metallurgy, after completing subcourse I, will continue quantitative analysis applied to minerals, ores, crude metals, metallurgical products, furnace gases and fuels. (Prof. Daniells.)

Required daily during Junior year and the first two terms of the Senior year.

Subcourse VI, Toxicology and Urine Analysis. Students preparing for the study of medicine follow subcourse I. After a sufficient amount of Quantitative Analysis has been done to acquire a knowledge of analytical methods, and sufficient skill in manipulating, special work in urine analysis and toxicology will be taken up. (Prof. Daniells.)

Subcourse VII, Teachers' Course. Students preparing to become teachers, after completing subcourses I and III, will be given instructions in higher theoretical and experimental chemistry, the determination of atomic weights, the laws of molecular volumes, etc. (Prof. Daniells.)

Subcourse VIII, Short Course. A brief course of descriptive inorganic and organic chemistry, intended to give an outline of the science, with some knowledge of the principles governing chemical changes. Daily during the spring term of the Junior year. (Prof. Daniells.)

Required of all students who do not take subcourse II, or its equivalent.

The laboratories are open daily from 8:30 A. M. to 5 P. M. Classes in laboratory work (qualitative and quantitative analysis, experimental and organic chemistry) are being conducted during the entire day, enabling students to adapt their work in this science to that in other courses.

MINERALOGY.

PROFESSOR HOBBS.

Subcourse I, Blowpipe Analysis. The rapid method of qualitative analysis. At least one term of chemistry is a prerequisite to this study. The course is chiefly a laboratory one. Besides being necessary to the mineralogist, it is adapted to students in the pre-medical course and in

the course in pharmacy, as well as to students who take long course work in chemistry. Three-fifths study during the fall term. Text-book: Landauer's Blow-pipe Analysis.

Required of all students who elect a long course in mineralogy and geology, and of all students in mining engineering.

Subcourse II, Crystallography. This course may be profitably taken by students who intend to do advanced work in chemistry or physics. The student is taught to distinguish the crystals of the different systems on the basis of symmetry, to derive all possible crystal forms from the most general form, to use the nomenclatures of Miller and Naumann, and Quensted's method of projection. A complete set of the glass crystal models of F. Thomas, of Siegen, and a selected collection of Krantz's wooden crystal models serve for illustration. Special advanced work with the reflecting goniometer may be taken in connection with this course. Two-fifths study during the fall term. Text-book: G. H. Williams' Crystallography.

Required of all students who take a long course in mineralogy and geology, and of all students in civil and mining engineering.

Subcourse III, General Mineralogy. Prerequisites are one term of chemistry and crystallography, as above. Lectures and recitations. After a treatment of the chemical and common physical characters of minerals, considerable time is devoted to optical mineralogy. A Nörremberg polarizing apparatus, a collection of Steeg and Reuter's oriented sections of minerals, Böhm and Wiedermann's models to illustrate wave surfaces and dispersion, Brill's plaster models of surfaces of elasticity, etc., and Werlein's glass models to illustrate the dispersion of monoclinic crystals, serve for illustration in this course. Two-fifths study during winter term.

Required of all students who elect a long course in mineralogy and geology, and of all students in civil and mining engineering.

Subcourse IV, Determinative Mineralogy. The necessary preliminaries are subcourses I and II, as given above. Given wholly in the laboratory. Three-fifths study during winter term. Text-book: Dana's Text-book of Mineralogy.

Required of all students in mining engineering.

Subcourse V, Descriptive Mineralogy. Prerequisite, subcourses II and III. Lectures, recitations, and examinations of cabinet mineral specimens, of which about 3,000 are in the systematic collection. The non-silicate minerals are considered in the order given by Groth in his Tabellarische Uebersicht der Mineralien (3d edition, 1889), while with the silicate minerals the natural groups are treated in a geological rather than a chemical order. It is recommended that students provide them-

selves with either Dana's Text-book of Mineralogy, or the text-book of Tschermak or Bauer. Two-fifths study during spring term. Arrangements for special advanced work can be made in this subject.

Required of all students who elect a long course in mineralogy and geology, and of all students of civil and mining engineering.

Subcourse VI, Microscopical Mineralogy. Prerequisites, subcourses II, III and V, as above. Given entirely in the laboratory, where each student is provided with a microscope for his especial use. The collections of 100 oriented crystal sections by Voigt & Hochgesang, and 80 by Julien, and a very large number of rock sections are available in this course. Three-fifths study during the spring term. Text-book: Microscopical Physiography of Rock-making Minerals, Rosenbusch-Iddings.

Required of all students in civil and mining engineering, and of all who elect a long course in mineralogy and geology. This course is a necessary preliminary to microscopic petrography.

GEOLOGY.

PRESIDENT CHAMBERLIN, PROFESSORS VAN HISE AND HOBBS.

[PROF. R. D. SALISBURY IN 1891–2.]

Subcourse I, General Geology. This embraces a general treatment of lithological, structural, dynamical, historical and geographic geology, and is intended to meet the wants of those who can take only a short, comprehensive course, and at the same time, to lay a broad, general foundation for those who wish to pursue special advanced studies. The constitution of rocks, the crystalline formations and the pre-Cambrian history will be treated by Prof. Van Hise (twice a week). Derivation and sedimentation, geographic evolution, life development and the post-Cambrian history will be treated by President Chamberlin (three times a week [Prof. Salisbury in 1891–2]. The two parts are to be taken together and constitute a full study, fall term. Text-books: Geikie's Class-book of Geology and Volume I, Geology of Wisconsin.

Required of all students in the General Science, Civil and Mining Engineering Courses.

Subcourse II, Microscopical Petrography. The necessary preliminaries to this study are subcourses II, III, V, and VI, under Mineralogy, as given above. Instruction is mainly in the laboratory, each student having a microscope assigned to his exclusive use. The University collection contains a good suite of rocks, including the general series of B. Stürz, known as the Rosenbusch collection, all of which have thin sections. The laboratory also owns the thin sections of the rocks of the Wisconsin State Geological Survey, about 600 in number. In addition,

the students have access to a collection of more than 10,000 rock specimens and 8,000 thin sections, illustrative of the pre-Cambrian rocks of North America. Much of this material has not been worked up and gives ample opportunity for special work by advanced students. It is desired to call attention of graduate students and specialists to the unusual opportunities offered for obtaining training in this new and important branch of geology. Two-fifths study during the fall term for students who, in addition to General Geology, take this course, but any student may devote all the time he can give to this subject throughout the entire year. (Profs. Hobbs and Van Hise.)
Elective.

Subcourse III, Special Geology. This course consists of the special study of selected themes intended to give the student a deeper insight into geological processes and methods of investigation. Subcourse I is to be taken preparatory to this. Winter term, three-fifths study. [Prof. Salisbury in 1891–2.] President Chamberlin.
Required of students taking a long course in geology, and of students in Mining Engineering.

Subcourse IV, Volcanic and Petrographic Geology. This course begins with five or six lectures on modern volcanic phenomena to familiarize the student with the larger structural features of the massive rocks. The remainder of the course is devoted to a classification of the massive rocks and a study of their properties so far as this is possible, without the use of the microscope. Students are expected to obtain such familiarity with the specimens in the collection as to distinguish readily members of the different families. Two-fifths study in the winter term (Prof. Hobbs.)
Required of students taking a long course in geology.

Subcourse V, Applied Geology. A necessary preliminary to this study is subcourse I. The course treats of the relations of geology to potable water, to structural materials, to soils, to mineral fuels, and to ore-deposits. The composition, properties, modes of occurrence, geological and geographical distribution of each of these classes are considered. The origin of the more important of the metalliferous and non-metalliferous deposits of economic value is discussed. Williams' Applied Geology is obtained by the students, but the course is largely given by lecture. Full study during the spring term. (Prof. Van Hise.)
Required of all students in the Civil and Mining Engineering courses.

Subcourse VI, Practical Field Geology. Geological mapping, construction and correlation of sections, description and identification of formations, aneroid measurements and their reduction, scientific use of terms,

method of reporting, etc. Spring term. To count according to time given to it.
Elective.

The full long under-graduate course in geology consists of subcourses I, II, III, IV, V and VI. The minimum that can be counted a long course embraces one full study throughout the year. Students desiring to take a long course in geology ought to take at least subcourses II, III and V in Mineralogy, and, if they wish petrography, must also take VI.

Subcourses II, III and V in Mineralogy, with I and III, or I and V in Geology will count as a long course in mineralogy and geology jointly.

Subcourse VII, Graduate Course. There is offered a graduate course in practical geology intended to meet the wants of those who desire to become professional geologists. The special character of the course will be determined by consultation with the professors in charge. Special facilities are offered in two general lines; sedimentary, erosive, glacial and geographic geology; and petrographic, metamorphic and crystalline geology. Students who have taken the preceding long under-graduate course will be prepared for either of these lines.

An under-graduate course of unusual excellence, preparatory to professional geology, may be formed by combining the engineering courses in descriptive geometry, topography, topographic drawing, geodesy and mechanics, with assaying, metallurgy, chemistry and mineralogy, and the judicious selection of the necessary physical and biological courses, super-added to a suitable mathematical and linguistic foundation.

ZOOLOGY.

PROFESSOR BIRGE AND MR. TRUE.

Subcourse I, General Zoology. Recitation course. Two recitations weekly, winter and spring terms. One hour weekly is given to demonstrations and exhibition of specimens. Text-book: Orton's Zoology.
Elective for all students.

Subcourse II, General Zoology. Two hours recitation and eight hours laboratory work weekly, winter and spring terms. In laboratory the types of Huxley and Martin's Biology are dissected. The recitations are the same as those in Subcourse I. (Mr. True in charge of laboratory.)
Required, with Botany II, of Freshmen in the General Science Course.

Subcourse III, Invertebrate Zoology. A general course in the morphology and classification of Invertebrates. The work will be on Arthropoda in the fall term, Mollusca in the winter term, and Vermes in the spring term. Text-book: Claus-Sedgwick's Zoology, Vogt and Jung's Lehrbuch der Praktischen Vergleichenden Anatomie.
Elective for students who have subcourse II.

Subcourse IV, Vertebrate Anatomy. Dissection of lamprey, shark, perch, pigeon and cat. Two recitations per week from Wiederheim's Anatomy of Vertebrates. For the completion of the course it is necessary to begin the laboratory work in the preceding spring term. Twelve hours weekly, fall and winter terms.

Elective to students who have had subcourse II.

Subcourse V, Histology. Two demonstrations weekly, fall term; additional laboratory work, ten hours weekly, fall term. The demonstrations include preparations of the more important tissues and organs, and in the laboratory the student learns the preparation of histological specimens.

The lectures are elective to students of subcourse IV or VI. The laboratory work is elective to students who had subcourse II.

Subcourse VI, Physiology. Three recitations weekly, fall and winter terms. Text-book: Martin's The Human Body.

The lectures of subcourse V may be taken with this course so as to make a full study during the fall term.

Elective.

Subcourse VII, Embryology. Three lectures and ten hours laboratory work weekly, spring term. The development of the chick during the first three days is studied. Text-books: Foster and Balfour's Embryology, Hertwig's Embryology of Vertebrates.

Elective to students who have had subcourse IV or V.

Subcourse VIII, Original Work. Students who have completed a sufficient amount of elementary work will be given facilities for advanced and original work. The precise character of the work will be determined by the professor in each case, so that no general statement can be made. In general, the study will be in the departments of histology or bacteriology.

Subcourses I, II and VI, are general courses and are open to any student. Subcourses III, IV, V, VII and VIII, are advanced courses and should be taken only by students whose interest in the subjects pursued is such as to lead them to devote a large amount of time to their prosecution.

A continuous course of two or three years is provided for as follows:

FIRST YEAR.	SECOND YEAR.	THIRD YEAR.
Subcourse II, Botany, Subcourse II.	Subcourses III or Subcourses IV and VII; or Subcourses V and VII, and Bacteriology I.	Subcourses V and VIII and Bacteriology I.

BACTERIOLOGY.

PROFESSOR BIRGE.

Subcourse I. Two recitations and ten hours laboratory work weekly, during the winter term. The recitations are from De Bary's Lectures on Bacteria. In the laboratory the student first learns the ordinary methods of staining cover-glass preparations, and the study of fresh and stained typical forms of the different groups of bacteria. Culture methods are then taken up, including the isolation and culture of various forms of bacteria in gelatine, agar, etc. Experiments in the isolation and determination of the bacteria of air, ice, snow and water follow, and the course concludes with experiments on disinfection by chemical means and by heat. The tubercle-bacillus is stained by the standard methods. The course is designed to give practical familiarity with the methods of bacteriology.

The study may be continued with more advanced laboratory work through the spring term.

BOTANY.

PROFESSOR BARNES AND MR. TRUE.

Subcourse I, Morphology of Flowering Plants. An elementary course, embracing lectures, field and laboratory work, intended to train the observing faculties by the study of the best known plants, and to impart information particularly as to their habits, mode of life and actions. It is intended to give Pharmacy students such a knowledge of the elements of botany and such a familiarity with plants themselves as will enable them to pursue profitably their studies in pharmacognosy. In the laboratory in the winter term students will examine the gross anatomy of the flowering plants and will be taught to describe accurately and to identify species of wild plants. The course of Pharmacy students is not complete until the fall term of the succeeding year, when a herbarium of twenty-five species of wild plants, fully described, must be presented. Three hours a week, fall term; four hours a week, winter term. Textbooks: Gray's Lessons in Botany; Gray's Manual; revised editions.

Required of students in Pharmacy, and of Ancient and Modern Classical students before graduation.

Subcourse II, General Morphology. Besides presenting the fundamental phenomena of living organisms as illustrated by the plant cell, the course is designed to acquaint the student with some of the important types of plants and their life-histories, and to serve as an introduction to vegetable histology and physiology. The course is not complete

until the spring term, when the morphology of the flower is studied. For students pursuing subcourse III or IV, this spring work is optional. Two lectures, eight hours laboratory work a week, fall term. Two hours a week, spring term. Manuals: Arthur, Barnes & Coulter's Handbook of Plant Dissection; Bessey's Botany. (Mr. True in charge of laboratory.)
Required of Freshmen in General Science Course; for Ancient and Modern Classical students elective after subcourse I.

Subcourse III, General Morphology. This course is recommended only as a sequel to II. Its aim is, by a continued study of the structure of various types of plants, to fill out and complete the student's idea of the forms of vegetable life. To this end such plants will be selected as supplement those used in subcourse II. Ten hours a week, winter and spring terms. Reference book: Goebel's Outlines of Classification.
Elective; offered only in odd years, alternating with subcourse IV.

Subcourse IV, Histology. A systematic study of the tissues of phanerogams and ferns. Instruction is given in the use of reagents and stains, modes of imbedding, section cutting and mounting. To obtain the most advantage from this course, students should have completed subcourse II, or at least should be familiar with the use of the microscope. Ten hours a week, winter and spring terms. Reference book: DeBary's Comparative Anatomy of Phanerogams and Ferns.
Elective; offered only in even years, alternating with subcourse III.

Subcourse V, Embryology and Physiology. About five weeks of the fall term will be given to studies in development, and the remainder of the year to a course in experimental physiology, supplemented by reference readings. Subcourses III or IV, and Chemistry, subcourse I, must precede this. Those taking it should be willing to give extra time when their experiments require it. Ten hours a week, three terms. Reference books: Detmer's Pflanzenphysiologisches Praktikum; Vines' lectures on Physiology of Plants.
Elective.

Subcourse VI, Special and Original Work. Facilities will be offered for special and original work, on which theses will be required. The course is offered only to advanced students who can devote a large amount of time to its prosecution. Those wishing to pursue such work should consult the professor in the winter or early spring preceding, in order that the line of work may be determined and suitable material collected and prepared in the proper season. Fifteen to twenty hours a week, three terms.
Elective.

A modification of subcourse IV is offered for Juniors in pharmacy who have completed the work of the fall term, viz.: a less thorough and exhaustive study of the tissues of phanerogams, but sufficient to give some idea of the minute structure of these plants. This study may be resumed in the Senior year at the same time and prosecuted with special reference to the structure of officinal barks, roots, rhizomes, seeds, etc. Ten hours a week, winter term.

Those who desire to pursue a continuous course in botany can do so by taking subcourses II, and III or IV, in the first year, V in the second, and VI in the third.

Those who have taken Subcourse II and wish to take both III and IV can utilize the fall term of one year in a study of some special group, such as the mosses.

For those who expect to teach botany in high schools subcourses II and III are the minimum preparation desirable; and to General Science students expecting to teach this subject subcourse I is recommended as a review, to be taken after II and III.

MILITARY SCIENCE AND TACTICS.

LIEUTENANT COLE.

This department of the University is maintained in accordance with United States and State statutes. By the regulations of the depart nent, all the able-bodied male students of the Freshman and Sophomore classes, and of the special courses, for the first two years of such courses, are required to take military exercise.

The work of the department embraces a course in tactics, a course of lectures on military subjects and practical instruction in the school of the soldier, company and battalion, target practice, sabre practice and artillery drill. The class in Tactics is formed November 1st, of each year, and may be elected by both classes. All non-commissioned officers are required to take the course, which continues through the winter term. The course of lectures may be elected during the winter term of the Sophomore year. Commissioned officers are expected to take this course. The study value of tactics and the lecture course is that of a two-fifths and one-fifth study respectively.

Freshmen who, prior to their entering the University, have received the equivalent of one year's instruction in the University battalion, will be required to drill during their Freshman year only; *provided*, that they furnish certificates from superintendents of military schools or commanding officers of military companies, setting forth in detail the military duty performed; that they are able at the opening of the drill season

to give instruction in the school of the soldier; that they take the full course in drill regulations, maintaining a class standing of 90 per cent.; that they waive all right of promotion and that their conduct and deportment are thoroughly satisfactory during the year. This regulation shall affect those students only who enter the University after the close of the college year 1890-91. All students ranking below Juniors, no matter how extended may have been their previous military training, will be required to take one year's drill in the University battalion.

Drill for Freshmen begins at the opening of the fall term and is held four times a week until November 1st. Well instructed Freshmen are assigned to duty as drill masters. A thorough knowledge of the school of the soldier is a prerequisite for such assignment. The drill is continued through the winter term and closes in May. The Sophomore privates commence drill November 1st, at which time the battalion is divided into two divisions, one division drilling Mondays and Wednesdays and one on Tuesdays and Thursdays. A crack company is chosen, by competition, from each of the divisions. The color sergeant and color corporals are also chosen by competition.

The officers and non-commissioned officers are selected from those members of the battalion who, in the opinion of the battalion commander, possess the highest qualifications as soldiers—attention to duty, knowledge of the tactics, practical efficiency as soldiers, and general soldierly bearing and deportment being factors in determining relative availability.

The uniform of the battalion is prescribed by regulation, and can be obtained in Madison.

The University battalion is at present composed of four companies. The following is the

ROSTER

of officers and non-commissioned officers of the University Battalion for the year 1890-91.

1st Lieut. James A. Cole, 9th U. S. Cavalry, Commanding Battalion.

BATTALION STAFF.

Captain and Adjutant, Moss, J.
Captain and Quartermaster, Erbach.
Captain and Battalion Inspector, Stevens.

COMPANY "A."

Captain, Myers; 1st Lieutenant, Ziemer; 2d Lieutenant, Ford; 1st Sergeant, Tessier; Sergeants, Silber, Strong A. W., Carpenter, Rickeman; Corporals, Melaas, Carleton.

COMPANY "B."

Captain, Parker; 1st Lieutenant, Burton W. E.; 2d Lieutenant, Wray; 1st Sergeant, Katzenstein; Sergeants, Curtis, Thorbus, Blake, Smith E. A.; Corporals, Beffel, Hawley C. F.

COMPANY "C."

Captain, Sweet; 1st Lieutenant, Doyon; 2d Lieutenant, Case; 1st Sergeant, Kellogg; Sergeants, Moss M. C., Spensley C. F., Shurly, Spensley H. G.; Corporals, Howland, Henning, Rienow.

COMPANY "D."

Captain, Lardner; 1st Lieutenant, Swope; 2d Lieutenant, Boardman; 1st Sergeant, Burton; Sergeants, Baehr, Cleveland, Beebe, Coe; Corporals, Hill, Bierhart, Burt.

FIRST DIVISION CRACK COMPANY.

Silber, Strong A. W., Carpenter, Rickerman, Melaas, Carlton, Curtiss, Thorbus, Blake, Smith E. A., Beffel, Hawley C. F., Bill, Bowman, Dow G., Dawson, Durfee, Ford, Fales, Kelly, Kanneberg, Kull, Kinney, Knapp, Messersmith, Monahan, McGregor, Pease B. D., Parker, Rohn, Smart M. M., True, Williams C. H. 33 men.

SECOND DIVISION CRACK COMPANY.

Kellogg, Moss M. C., Spensley C. F., Shurly, Spensly H. G., Howland, Henning, Rienow, Baehr, Cleveland, Beebe, Coe, Hill, Bierhart, Burt, Austin O., Dockery, Dow, Dunning, Elwell, Evans, Graves, Hawley E. E., Hanks, Kurtz, Menges, Newton, O'Connor, Peterson, Soden, Schultz, Whitson, Tibbits. 33 men.

MUSIC.

PROFESSOR PARKER AND MR. SIRED.

Harmony may be taken as an elective, counting as a two-fifths study, during the first two terms of the year. The class will be organized at the beginning of the fall term and will meet twice a week. (Prof. Parker.)

There are two general classes in music, each of which meets once a week during the collegiate year. One of these begins at the opening of each year, with a course in the elements of the theory of music, combined with practical exercises in the art of reading vocal music. All students who desire to join this class are admitted without restriction. (Mr. Sired.)

The second class is devoted to the practice of glees, choruses, part-songs, etc. The selections of music are varied in kind and style, for the purpose of acquainting the students with the works of both classical and modern authors. All who enter this class are expected to read plain music readily. (Prof. Parker.)

Smaller organizations for special occasions or general practice are encouraged, and receive such attention as can be given without detriment to other work.

Private lessons in vocal culture, piano playing and harmony, are given to students pursuing any of the regular courses of study on application and presentation of a card from the Secretary of the Board of Regents, to indicate that the fees mentioned under the head of expenses have been paid. Special students taking two studies may receive private lessons on the same conditions by consent of the Faculty.

The instruction, both in singing and piano playing, is designed to be thorough and progressive, combining a careful technical training with proper guidance to intelligent interpretation.

HYGIENE AND SANITARY SCIENCE.

DR. ALMAH J. FRISBY.

Instruction in personal hygiene and sanitary science is given twice a week during the fall and winter terms. The course each term covers the subjects of food and drink, care of the person, clothing, exercise, healthy and unhealthy residence sites, modes of construction of houses, house drainage and sanitary plumbing, water-supply, ventilation and heating, causes and prevention of contagious and other diseases, treatment of emergencies, preservation of the eyesight and hearing, etc.

Attendance upon these lectures during one term is required of all Freshmen and special students in their first year.

PHYSICAL TRAINING.

CLARA E. S. BALLARD.

This is the second year that the University has offered opportunity for physical training to the young women students. The aim of this training is to secure a symmetrical development of the muscular system, to improve the circulation and produce healthy action in all the organs of the body.

Each student is examined and measured on beginning the work in order to discover physical defects. Individual work is assigned for the correction of these. There is a four years' course, consisting of free or Swedish movements, deep breathing exercises, dumb bell drill, chest weight work and other exercises with apparatus.

All exercises in the gymnasium are taken under the personal direction of the instructor, and every precaution is taken to prevent over-exertion.

Class instruction is given twice a week from the beginning of the fall term until May 1st. As many classes will be organized as are necessary for the accommodation of students. For those who wish to take daily exercise, a line of work will be marked out especially adapted to the need of the individual.

GENERAL INFORMATION.

TEACHERS' INSTITUTE LECTURESHIP.

An admirable system of Teachers' Institutes is maintained in Wisconsin under the supervision of the Regents of the State Normal Schools. By a special act of the Legislature of 1883 the Professor of Pedagogy of the University was appointed lecturer to these institutes, and a special appropriation made to meet the necessary expenses. Through this provision about forty lectures are given annually at as many different institutes held in various portions of the State. These lectures are directed in part toward the promotion of advanced professional work and in part toward fostering higher and broader educational views among the people.

LITERARY AND SCIENTIFIC SOCIETIES.

The literary societies, the Athenæan, Hesperian, Adelphian and Philomathian, composed of gentlemen, and the Castalian and Laurean, composed of ladies, are sustained with unusual interest and constitute an important means of intellectual training. A German society, the Bildungsverein, and a Scandinavian society, the Nora Samlag, cultivate an interest in the German and Norse languages and literature. A Natural History Club offers opportunities for the presentation and discussion of themes relating to natural science. Occasional excursions are conducted under its auspices.

LADIES' HALL.

Lady students are allowed the same choice of boarding accommodations that is accorded to gentlemen, but to provide for those who prefer a home under the immediate auspices of the University, a Ladies' Hall is maintained. It contains suites of rooms for sixty-two students, and ample accommodations for boarding. The apartments are in suites of two and three rooms, each suite accommodating four students. There is a bath-room on each floor. The building is heated by steam, lighted by gas, has three fire escapes, and other precautions have been taken to render it as secure as practicable against fire. Students' rooms are

carpeted and furnished, but occupants are expected to provide washstand furniture, towels, napkins, napkin rings, sheets, pillow-cases, counterpanes and blankets. Young women occupying this building are under the immediate charge of the preceptress, and are required to board in the Hall. They are expected to cheerfully conform to the requirements necessary for a family of students. Students are admitted only on the expectation of remaining throughout the term, and the charges for board are by the term and not for any fraction of it. No deduction is made for voluntary absence, and any commutation in cases where students leave before the close of the term, except in cases of necessity, is entirely voluntary with the preceptress in charge. To secure rooms in advance, payment of room-rent for the ensuing term ($6.00) must be made to the Secretary of the Board. The music department has accommodations in this building, with music rooms for piano practice, and a hall for the use of general music classes, gymnastics and the ladies' literary societies.

No responsibility is assumed for lady students rooming in the city beyond that involved in good scholarship and general deportment.

The foregoing statements and the prices of board given below under the head of "Charges and Fees" relate to the current year and are subject to modification for the ensuing year. The price of board will be no greater than that stated.

ROOMS AND BOARD.

Rooms furnished and unfurnished can be obtained in the city at reasonable rates. The cost of board in clubs is from $2.00 to $2.50 per week; in private families from $3.00 to $4.00 per week. Washing costs from sixty to seventy-five cents per dozen. Many of the students support themselves in whole or in part. The places offering available work are eagerly sought for and cannot always be obtained at once. Those dependent on themselves should secure some means before coming here, and be ready to wait and learn how to help themselves.

CHARGES AND FEES.

Tuition for residents of the State of Wisconsin,	FREE.
Tuition for non-resident students, per term,	$6 00
General Expenses — First term,	5 00
General Expenses — Second Term,	5 00
General Expenses — Third Term	2 00
Room-rent in Ladies' Hall, per term,	6 00

Fuel and light in Ladies' Hall at actual cost, (about $20 a year).

Board in Ladies' Hall — Fall Term,	$50 75
Board in Ladies' Hall — Winter Term	42 00
Board in Ladies' Hall — Spring Term,	36 75
Washing, Ladies' Hall, per dozen,	60
Instrumental Music, 20 lessons,	10 00
Use of instrument for practice, 10 weeks,	2 00–5 00
Vocal Music, 20 lessons,	10 00

Students will be charged for not less than one term, and no deduction will be made for voluntary absence. Payment of all University charges for tuition, room-rent, heating, etc., is required strictly in advance, and made to the Secretary of the Board of Regents.

Students working in the laboratories are required to pay a fee to cover the cost of the materials and instruments used by them. When this cannot be fixed before hand a deposit sufficient to cover the probable cost is required and an account of the same is kept, and the amount of the deposit not used is returned to the student at the close of his term of study in the laboratory.

The items of expense are subject to revision at the commencement of each collegiate year.

COLLEGE OF MECHANICS AND ENGINEERING.

FACULTY.

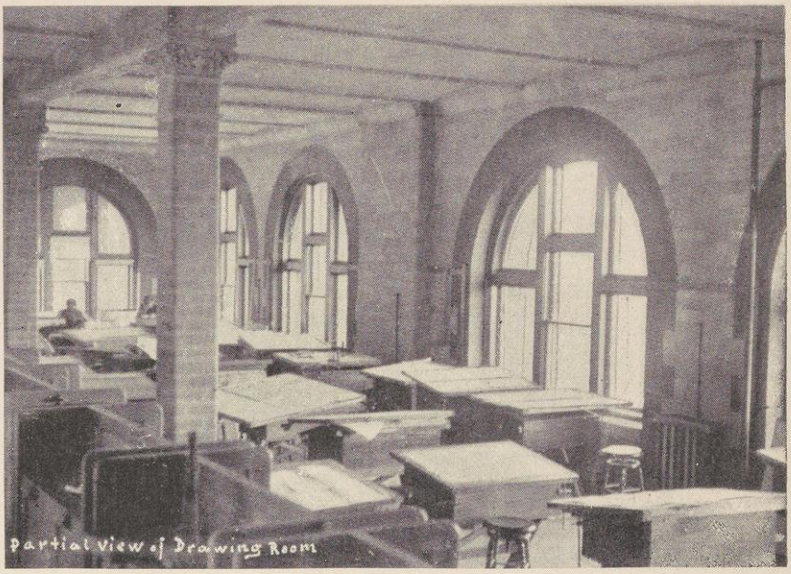
THE PRESIDENT OF THE UNIVERSITY.
STORM BULL, Professor of Mechanical Engineering.
C. D. MARX, Professor of Civil Engineering.
G. B. RANSOM, Professor of Steam Engineering.
C. I. KING, Professor of Mechanical Practice.
L. M. HOSKINS, Assistant Professor of Pure and Applied Mechanics.
J. E. DAVIES, Professor of Physics.
W. W. DANIELLS, Professor of Chemistry.
C. A. VAN VELZER, Professor of Mathematics.
C. R. VAN HISE, Professor of Archæan and Applied Geology.
W. H. ROSENSTENGEL, Professor of German.
E. T. OWEN, Professor of French.
D. B. FRANKENBURGER, Professor of Rhetoric.
G. C. COMSTOCK, Professor of Astronomy.
J. A. COLE, Professor of Military Science and Tactics.
C. S. SLICHTER, Assistant Professor of Mathematics.
H. W. HILLYER, Assistant Professor of Organic Chemistry, Instructor in Assaying.
W. H. HOBBS, Assistant Professor of Mineralogy and Metallurgy.
H. B. LOOMIS, Instructor in Physics.
A. E. PALMER, Instructor in Elocution.
A. A. KNOWLTON, Instructor in Rhetoric.

The College of Mechanics and Engineering offers seven systematic courses as follows:

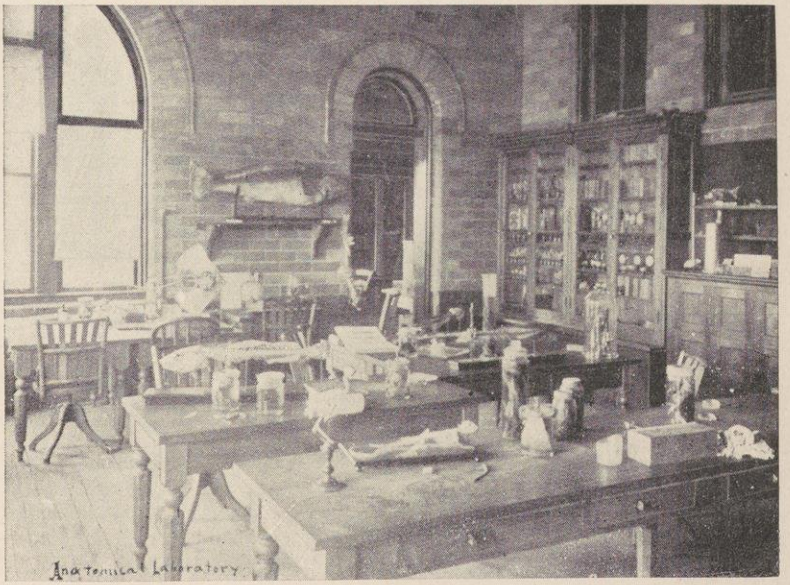
Civil Engineering,
Railway Engineering,
Mechanical Engineering.
Railroad Mechanics.
Mining Engineering,
Metallurgical Engineering.
Electrical Engineering.

REQUIREMENTS FOR ADMISSION.

The requirements for admission are alike for all the engineering courses and are as follows: English grammar, including sentential analysis and orthography, political and physical geography, history of the U. S., arithmetic, algebra through quadratics, plane and solid geome-



Partial view of Drawing Room



Anatomical Laboratory

try, physiology, botany, natural philosophy, German grammar (the equivalent of Sheldon's Short Course), and twenty lessons in any standard German reader. An equivalent amount of French may be substituted for the German. Candidates may be admitted as special students in engineering by passing upon all of the above studies except German.

The rules respecting equivalents and conditions given under the College of Letters and Science apply here.

For the requirements for the year 1892–3, see page 70.

ADMISSION FROM ACCREDITED SCHOOLS.

The graduates of schools accredited for the General Science Course, College of Letters and Science, will be admitted to the Engineering Courses upon presentating of diplomas or special certificates. See list on page 73.

LOCAL EXAMINATIONS.

Local examinations for admission to the Engineering courses will be given on the same conditions as those offered for admission to the literary and scientific courses, given on page 65.

ENGINEERING LABORATORIES.

The engineering laboratories contain a variety of apparatus for experimental purposes, among which are the following: Three testing machines made by Tinius Olsen & Co., of 10,000 pounds, 20,000 pounds and 50,000 pounds capacity respectively, provided with tools for making tests in tension, compression, bending and torsion; a Thurston autographic torsion testing machine, a Riehle Bros. cement testing machine of 1,000 pounds capacity, with the necessary clamps and apparatus for measuring and moulding; high and low level tanks of large capacity, fitted for experimenting on and determining the flow of water through orifices and pipes and over weirs; friction brakes of large and small capacity and transmitting dynamometers suitable for carrying out a great variety of tests; a ten-horse power experimental turbine wheel. A ten-horse power vertical steam engine supplies power to the laboratory. There is a fifty-horse power quarter-crank compound engine, so arranged that either cylinder can be supplied with live steam from the boiler and run as a single cylinder engine. The condensor and pumps can also be disconnected so that the engine may be run as a non-condensing one. Both cylinders and the receiver are provided with steam jackets, which may be put out of use at will. By means of a Proell governor the number of revolutions may be varied from 50 to 125. The cylinders

have each four puppet valves and the cut-off of the steam is automatically controlled by the governor and may vary between zero and nine-tenths of the stroke. A new fifty-one horse power Root boiler furnishes the steam for this engine exclusively, and will be run in connection with it for the large number of interesting experiments and tests which may be carried out by means of this very perfect engine. There are also the necessary tanks, weighing apparatus, pyrometers, calorimeters, etc., for making complete tests of the economy and capacity of boilers; with a variety of minor and accessory apparatus. The laboratory contains a large model of Stephenson's link motion, in connection with the piston, cross-head, connecting-rod and crank of engine. It is made in such a way that the dimensions of all the different parts of the model can be changed at will. There is also a small beam engine, with Corliss valve gear, cylinder 4½″ x 9″, an Ericsson hot-air engine, a small dynamo, furnishing light to the laboratory, with a small high speed engine furnishing the motive power; a small compound marine engine, with surface condenser and pumps. All these last named machines, including the link motion, have been made by the Seniors in Mechanical Engineering of the last few years. Two lathes (in addition to those in the machine shop) are placed in the laboratory for convenience in preparing specimens for the testing machine.

The engineering museum contains a complete set of Schroeder's models for descriptive geometry, including shades, shadows and perspective; also a small but carefully selected collection of Schroeder's kinematic models, besides a number of smaller models, made by students, illustrative of kinematics.

The draughting room contains a large and varied collection of general working and detailed drawings illustrating a great variety of engineering structures and machines.

The Civil Engineering department is very completely equipped with surveying instruments, gauges, meters, etc. The standard of weights and measures belonging to the State are kept in this department, and all official comparisons are made here.

THE ASSAY LABORATORY.

The assay laboratory, situated in the south part of the basement of the chemical building, is one of the largest and best equipped laboratories of its kind in the country. It has separate rooms for furnaces, tables, wet assaying, and balances. The furnace room is supplied with eleven crucible and three muffle furnaces, as well as a small gas plant. It has steam power, a Sturtevant blower, bullion rolls, a Blake ore crusher, and other pulverizers. The table room has space for twenty-four students,

and is well supplied with ordinary balances. In the balance room are first-class quantitative balances by Becker, and an Oertling's gold balance.

MACHINE SHOP.

The machine shop affords excellent facilities for mechanical practice. It embraces a main machine-room equipped with eight engine lathes, a polishing lathe, a 24″ wood lathe, a grinding lathe, a shaper, two planers, a milling machine, a turret lathe and two drilling machines; a room for smaller machines, furnished with an engine lathe, a milling machine, a polishing lathe, a drill; a carpenter shop supplied with a planer, two saws, a shaper, a sticker, a mortising machine, a tenoning machine and a scroll saw; a forge room provided with ten forges and their equipment, supplied with a Sturtevant blower for the blast, and an exhaust fan for ventilation; a foundry room whose equipment consists of a cupola, brass furnace and core oven, with the necessary small tools; a wood-work room supplied with benches, carpenter tools, and wood turning lathes, sufficient for the accommodation of twenty-four students, and a pattern room furnished with the requisite tools.

The shop is supplied with convenient lockers, closets and wash-room with hot and cold water.

GENERAL LIST OF ENGINEERING STUDIES.

Those subcourses in the College of Engineering which are identical with those in the College of Letters and Science are not repeated here and will be found under the head of General List of Studies, College of Letter and Science, p. 79.

FALL TERM.

PURE AND APPLIED MECHANICS —

I. Elementary Mechanics, half study, Prof. Ransom.
II. Elementary Mechanics, three-fifths study, Prof. Hoskins.
III. Analytical Mechanics, full study, Prof. Hoskins.
IV. Graphic Statics, full study, Prof. Hoskins.
VII. Theory of Structures, full study, Prof. Marx.

DESCRIPTIVE GEOMETRY —

I. Elementary Descriptive Geometry, half study, Profs. Bull and Ransom.

MATHEMATICS —

I. Algebra, full study, Prof. Slichter.
V. Analytic Geometry, three-fifths study, Prof. Van Velzer.
VI. Calculus, two-fifths study, Prof. Van Velzer.

SPECIAL ENGINEERING —

III. Elements of Machines, three-fifths study, Prof. Bull.

VI. Steam Engine, full study, Prof. Bull.

ELECTRICAL ENGINEERING —

III. Elementary Testing, full study, Prof. Davies.

IV. Advanced Electrical Testing, full study, Prof. Davies.

DRAUGHTING —

II. Descriptive Geometry Problems, ten hours per week, Prof. Bull and Mr. Richter.

III. Elements of Machines, ten hours per week, Prof. Bull and Mr. Richter.

V. Machine Construction, ten hours per week, Prof Bull.

VII. Graphic Statics, ten hours per week, Prof. Hoskins.

VIII. Framed Structures, ten hours per week, Prof. Marx.

X. Metallurgical Structures, ten hours per week.

SHOP WORK —

I. Shop Work in Wood, ten hours per week, five weeks, Prof. King.

II. Machine Work in Wood, ten hours per week, five weeks, Prof. King.

III. Pattern Work, ten hours per week, five weeks, Prof. King.

VI. Forge Work, five hours per week, Prof. King.

VII. Machine Work in Iron, ten hours per week, Prof. King.

X. Machine Construction, ten hours per week, eighty hours, Prof. King.

METALLURGY —

I. Iron, etc., full study, Prof. Hobbs.

WINTER TERM.

TOPOGRAPHICAL ENGINEERING —

I. Elementary Surveying, three-fifths study.

II. Railroad Surveying, two-fifths study, Prof. Hoskins.

III. Geodesy, full study, Prof. Hoskins.

PURE AND APPLIED MECHANICS –

III. Analytical Mechanics, full study, Prof. Hoskins.

V. Graphic Statics, two-fifths study, Prof. Bull.

VIII. Mechanics of Machinery, full study, Prof. Bull.

IX. Thermodynamics, full study, Prof. Ransom.

X. Thermodynamics, three-fifths study, Prof. Ransom.

DESCRIPTIVE GEOMETRY —

II. Advanced Descriptive Geometry, three-fifths study, Prof. Bull.

MATHEMATICS —

II. Algebra, two-fifths study, Prof. Slichter.

IV. Plane Trigonometry, three-fifths study, Prof. Slichter.

VI. Calculus, full study, Prof. Van Velzer.

SPECIAL ENGINEERING —

II. Hydraulic Engineering, full study, Prof. Marx.

III. Elements of Machines, three-fifths study, Prof. Bull.

IV. Masonry Construction, three-fifths study, Prof. Marx.

V. Mine Engineering, three-fifths study.

VIII. Hydraulic Motors, three-fifths study, Prof. Bull.

X. Locomotive, full study.

XVI. Construction and Maintenance of Way, three-fifths study.

ELECTRICAL ENGINEERING —

III. Elementary Testing, full study, Prof. Davies.

V. Dynamo Testing and Design, full study, Prof. Davies.

DRAUGHTING —

I. Elementary, ten hours per week, Prof. Hoskins, Mr. Richter and Mr. Hinrichs.

III. Elements of Machines, eight hours per week, Prof. Bull and Mr. Richter.

IV. Graphic Statics Problems, eight hours per week, Prof. Bull.

V. Machine Construction, ten hours per week, Prof. Bull.

VI. Topographical, six hours per week, Profs. Marx and Hoskins.

VIII. Framed Structures, ten hours per week, Prof. Marx.

IX. Mines and Mine Timbering, ten hours per week.

X. Metallurgical Structures, five hours per week.

SHOP WORK —

IV. Hand Work in Iron, five hours per week, Prof. King.

VIII. Tool Making, five hours per week, Prof. King.

XI. Model Design and Construction. ten hours per week, Prof. King.

ASSAYING —

II. Dry Methods, Bullion, full study, Prof. Hillyer.

SPRING TERM.

TOPOGRAPHICAL ENGINEERING —

I. Elementary Surveying, one and two-fifths study, Prof. Marx.

PURE AND APPLIED MECHANICS —

VI. Mechanics of Materials, one and two-fifths study, Prof. Hoskins.

VIII. Mechanics of Machinery, two-fifths study, Prof. Bull.

MATHEMATICS —

IV. Spherical Trigonometry, two-fifths study, Prof. Slichter.

V. Analytic Geometry, three-fifths study, Prof. Slichter.

VI. Calculus, full study, Prof. Van Velzer.

DESCRIPTIVE GEOMETRY —

I. Elementary Descriptive Geometry, full study, Prof. Ransom and Mr. Richter.

SPECIAL ENGINEERING —

I. Sanitary Engineering, full study, Prof. Marx.

III. Elements of Machines, three-fifths study, Prof. Bull.

VI. Steam Engine, full study, Prof. Bull.

VII. Steam Engine, two-fifths study, Prof. Ransom.

VIII. Hydraulic Motors, three-fifths study, Prof. Bull.

IX. Hoisting Machinery, two-fifths study, Prof. Bull.

XI. Hoisting, Pumping and Excavating Machinery, two-fifths study.

XII. Railway Machinery, full study.

XIII. Economic Theory of Railroad Location, three-fifths study.

XIV. Railroad Field Work, two-fifths study.

XV. Railway Equipment, three-fifths study.

XVI. Construction and Maintenance of Way, two-fifths study.

ELECTRICAL ENGINEERING —

III. Elementary Testing, two-fifths study, Prof. Davies.

V. Dynamo Testing and Design, full study, Prof. Davies.

DRAUGHTING —

II. Descriptive Geometry Problems, five hours per week, Prof. Bull and Mr. Richter.

III. Elements of Machines, eight hours per week, Mr. Richter and Mr. Hinrichs.

V. Machine Construction, ten hours per week, Prof. Bull.

VI. Topographical and Platting, five hours per week, Profs. Marx and Hoskins.

IX. Mines and Mine Timbering, ten hours per week.

X. Metallurgical Structures, five hours per week.

SHOP WORK —

V. Surface-plate Work, five hours per week, Prof. King.

IX. Machine Construction, eight hours per week, Prof. King.

XII. Model Construction and Testing, ten hours per week, Prof. King.

ASSAYING —

II. Dry Methods, Bullion, full study, Prof. Hillyer.

COURSES OF STUDY.

CIVIL ENGINEERING COURSE.

FRESHMAN YEAR.

FALL TERM.

GERMAN, subcourse VII, Reader, *full study*; or,*
FRENCH, subcourse III, *full study*,* or subcourse IV, *half study*.
MATHEMATICS, subcourse I, Algebra, *full study*.
PRACTICAL MECHANICS, subcourses I, II and III, *ten hours a week*.
RHETORIC, subcourse V, Practical, *three-fifths study*.
HYGIENE, *two-fifths study*.

WINTER TERM.

GERMAN, subcourse VII, Reader, *full study*; or,
FRENCH, subcourse III, *full study*, or subcourse IV, *half study*.
MATHEMATICS, subcourse II, Algebra, *two-fifths study*.
MATHEMATICS, subcourse IV, Plane Trigonometry, *three-fifths study*.
RHETORIC, subcourse V, Practical, *two-fifths study*.
DRAUGHTING, subcourse I, Elementary, *ten hours a week*.
ELOCUTION, *three-fifths study*.

SPRING TERM.

GERMAN, subcourse VII, Scientific Reader, *full study*; or,
FRENCH, subcourse III, *full study*, or subcourse IV, *half study*.
MATHEMATICS, subcourse IV, Spherical Trigonometry, *two-fifths study*.
MATHEMATICS, subcourse V, Analytic Geometry, *three-fifths study*.
DESCRIPTIVE GEOMETRY, subcourse I, Elementary, *full study*.
DRAUGHTING, subcourse II, Descriptive Geometry Problems, *five hours a week*.

Essays, declamations, once a week throughout the year.

Military drill from September 20 to May 15. Military tactics (optional) in winter term.

* The language of the Freshman year must be the same as that offered for the entrance examination.

The subcourses given here, except those in engineering and mathematical studies, are those of the College of Letters and Science.

SOPHOMORE YEAR.

FALL TERM.

MATHEMATICS, subcourse V, Analytic Geometry, *three-fifths study.*
MATHEMATICS, subcourse VI, Calculus, *two-fifths study.*
MECHANICS, subcourse I, Elementary, *half study.*
CHEMISTRY, subcourse I, Lectures and laboratory practice, *full study.*
DESCRIPTIVE GEOMETRY, subcourse I, Elementary, *half study.*
DRAUGHTING, subcourse II, Descriptive Geometry Problems, *ten hours a week.*

WINTER TERM.

MATHEMATICS, subcourse VI, Calculus, *full study.*
TOPOGRAPHICAL ENGINEERING, subcourse I, Elementary Surveying, *three-fifths study.*
CHEMISTRY, subcourse I, Inorganic Analysis, *four-fifths study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
DRAUGHTING, subcourse VI, *six hours a week.*

SPRING TERM.

MATHEMATICS, subcourse VI, Integral Calculus, *full study.*
PHYSICS, subcourse II, Experimental Lectures, *full study,*
TOPOGRAPHICAL ENGINEERING, subcourse I, Field practice, *one and two-fifths study.*
DRAUGHTING, subcourse VI, Topographical, *five hours a week.*

Essays, declamations and elocution once a week throughout the year.

Military drill from November 1 to May 15. Military tactics, etc. (optional), in the winter term.

JUNIOR YEAR.

FALL TERM.

MECHANICS, subcourse III, Analytical, *full study.*
PHYSICS, subcourse III, Electricity and Magnetism, *three-fifths study.*
MINERALOGY, subcourse II, Crystallography, *two-fifths study.*
APPLIED MECHANICS, subcourse IV, Graphic Statics, *full study.*
DRAUGHTING, subcourse VII, Graphic Statics Problems, *ten hours a week.*

WINTER TERM.

MECHANICS, subcourse III, Analytical, *full study.*
APPLIED MECHANICS, subcourse X, Thermodynamics, *three-fifths study.*

MINERALOGY, subcourse III, General, *two-fifths study.*

TOPOGRAPHICAL ENGINEERING, subcourse II, Railroad Surveying, *two-fifths study.*

ENGINEERING, subcourse IV, Masonry Construction, *three-fifths study.*

DRAUGHTING, subcourse VIII, Problems in Construction, *ten hours a week.*

SPRING TERM.

APPLIED MECHANICS, subcourse VI, Mechanics of Materials, Text-book and Laboratory work, *one and two-fifths study.*

ENGINEERING, subcourse XIV, Railroad Field Work, *two-fifths study.*

MINERALOGY, subcourse V, Descriptive, *two-fifths study.*

MINERALOGY, subcourse VI, Microscopical, *three-fifths study.*

ENGINEERING, subcourse VII, Steam Engine, *two-fifths study.*

DRAUGHTING, subcourse VI, Topographical and Platting, *six hours a week.*

Five essays and one oration during the year.

SENIOR YEAR.

FALL TERM.

METALLURGY, subcourse I, Iron, etc., *full study.*

APPLIED MECHANICS, subcourse VII, Theory of Structures, *full study.*

GEOLOGY, subcourse I, General, *full study.*

DRAUGHTING, subcourse VIII, Design of Iron and Steel Structures, *ten hours a week.*

WINTER TERM.

ENGINEERING, subcourse II, Hydraulics, *full study.*

ASTRONOMY, subcourse II, Practical, *three-fifths study.*

TOPOGRAPHICAL ENGINEERING, subcourse III, Geodesy, *full study.*

DRAUGHTING, subcourse VIII, Schemes for Ventilation, Drainage, etc., *ten hours a week.*

SPRING TERM.

ENGINEERING, subcourse I, Sanitary, *full study.*

GEOLOGY, subcourse V, Applied, *full study.*

ASTRONOMY, subcourse II, Practical, *three-fifths study.*

DRAUGHTING, Drawing for Thesis, *ten hours a week.*

One essay and one thesis required in Senior year.

A thesis is required for graduation, which must be approved by the Professor of Rhetoric, as well as by the Professor of Civil Engineering.

RAILWAY ENGINEERING COURSE.

FRESHMAN YEAR.

The same as in the Civil Engineering Course.

SOPHOMORE YEAR.

The same as in the Civil Engineering Course.

JUNIOR YEAR.

FALL TERM.

The same as in the Civil Engineering Course.

WINTER TERM.

The same as in the Civil Engineering Course.

SPRING TERM.

APPLIED MECHANICS, subcourse VI, Mechanics of Materials, *one and two-fifths study.*

ENGINEERING, subcourse XIV, Railroad Field Work, *two-fifths study.*

ENGINEERING, subcourse XIII, Economic Theory of Railroad Location, *three-fifths study.*

ENGINEERING, subcourse VI, Steam Engine, *full study.*

DRAUGHTING, subcourse VI, Topographical and Platting, *six hours a week.*

Five essays and one oration during the year.

SENIOR YEAR.

FALL TERM.

APPLIED MECHANICS, subcourse VII, Theory of Structures, Bridge Building, *full study.*

METALLURGY, subcourse I, Iron, etc., *full study.*

GEOLOGY, subcourse I, General, *full study.*

DRAUGHTING, subcourse VIII, Design of Iron and Steel Structures, *ten hours a week.*

WINTER TERM.

ENGINEERING, subcourse II, Hydraulics, *full study.*

ASTRONOMY, subcourse II, Practical, *three-fifths study.*

TOPOGRAPHICAL ENGINEERING, subcourse III, Geodesy, *full or elective study.*

ENGINEERING, subcourse XVI, Construction and Maintenance of Way, *three-fifths study.*

DRAUGHTING, subcourse VIII, Bridge Designs and Railroad Architecture, *ten hours a week.*

SPRING TERM.

ENGINEERING, subcourse XI, Hoisting, Pumping and Excavating Machinery, *two-fifths study.*

ENGINEERING, subcourse XV, The Locomotive and General Equipment, *three-fifths study.*

ENGINEERING, subcourse XVI, Railroad Engineering, *two-fifths study.*

GEOLOGY, subcourse V, Applied, *full study.*

ASTRONOMY, subcourse II, Practical, *three-fifths study.*

DRAUGHTING, Drawing for Thesis, *ten hours a week.*

One essay and one thesis required in Senior year.

A thesis is required for graduation, which must be approved by the Professor of Rhetoric as well as by the Professor of Civil Engineering.

MECHANICAL ENGINEERING COURSE.

FRESHMAN YEAR.

The same as in the Civil Engineering Course.

SOPHOMORE YEAR.

FALL TERM.

MATHEMATICS, subcourse V, Analytic Geometry, *three-fifths study.*

MATHEMATICS, subcourse VI, Calculus, *two-fifths study.*

DESCRIPTIVE GEOMETRY, subcourse I, Elementary, *half study.*

MECHANICS, subcourse I, Elementary, *half study.*

CHEMISTRY, subcourse I, Lectures and Laboratory practice, *full study.*

DRAUGHTING, subcourse II, Descriptive Geometry Problems, *ten hours a week.*

WINTER TERM.

MATHEMATICS, subcourse VI, Calculus, *full study.*

ENGINEERING, subcourse III, Elements of Machines, *three-fifths study.*

PHYSICS, subcourse II, Experimental Lectures, *full study.*

CHEMISTRY, subcourse II, Inorganic Analysis, *two-fifths study.*
DRAUGHTING, subcourse III, Elements of Machines, *eight hours a week.*
PRACTICAL MECHANICS, subcourse IV, *five hours shop-work a week.*

SPRING TERM.

MATHEMATICS, subcourse VI, Calculus, *full study.*
ENGINEERING, subcourse III, Elements of Machines, *three-fifths study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
CHEMISTRY, subcourse II, Inorganic Analysis, *two-fifths study.*
DRAUGHTING, subcourse III, Elements of Machines, *eight hours a week.*
PRACTICAL MECHANICS, subcourse V, *five hours' shop-work a week.*

Essays, declamations and elocution, once a week throughout the year.

Military drill, from November 1 to May 15. Military tactics (optional) in the winter term.

JUNIOR YEAR.

FALL TERM.

ENGINEERING, subcourse III, Elements of Machines, *three-fifths study.*
MECHANICS, subcourse III, Analytical, *full study.*
PHYSICS, subcourse III, Electricity and Magnetism, *three-fifths study.*
DRAUGHTING, subcourse III, Elements of Machines, *ten hours a week.*
PRACTICAL MECHANICS, subcourses VI and VII, *ten hours shop-work a week.*

WINTER TERM.

MECHANICS, subcourse III, Analytical, *full study.*
MECHANICS subcourse V, Graphic Statics, *two-fifths study.*
APPLIED MECHANICS, subcourse IX, Thermodynamics, *full study.*
PHYSICS, subcourse III, Electricity and Magnetism, *three-fifths study.*
DRAUGHTING, subcourse IV, Problems in Graphic Statics, *eight hours a week.*
PRACTICAL MECHANICS, subcourse VIII, *five hours shop-work a week.*

SPRING TERM.

ENGINEERING, subcourse VI, Theory of Steam Engine, *full study.*
MECHANICS, subcourse VI, Mechanics of Materials, *full study.*
MECHANICS, subcourse VI, Laboratory Work, *two-fifths study.*
ENGINEERING, subcourse IX, Hoisting Machinery, *two-fifths study.*
DRAUGHTING, subcourse V, Hoisting Machinery, *eight hours a week.*
PRACTICAL MECHANICS, subcourse IX, *eight hours shop-work a week.*

Five essays and one oration required during the year.

SENIOR YEAR.

FALL TERM.

METALLURGY, subcourse I, Iron, etc., *full study.*
ENGINEERING, subcourse VI, Construction of Steam Engine, *full study.*
ENGINEERING, subcourse VI, Laboratory Work, *five hours a week.*
DRAUGHTING, subcourse V, Pumps, Steam Engine, *ten hours a week.*
PRACTICAL MECHANICS, subcourse X, *ten hours shop-work a week.*

WINTER TERM.

ENGINEERING, subcourse VIII, Hydraulic Motors, *three-fifths study.*
MECHANICS, subcourse VIII, Mechanics of Machinery, *full study.*
ASTRONOMY, subcourse II, Practical, *three-fifths study* (elective).
DRAUGHTING, subcourse V, Steam Engine, *ten hours a week.*
PRACTICAL MECHANICS, subcourse XI, *ten hours shop-work a week.*

SPRING TERM.

ENGINEERING, subcourse VIII, Hydraulic Motors, *three-fifths study.*
ASTRONOMY, subcourse II, Practical, *three-fifths study* (elective).
MECHANICS, subcourse VIII, Mechanics of Machinery, *two fifths study.*
DRAUGHTING, subcourse V, Steam Engine and Thesis, *fifteen hours a week.*
PRACTICAL MECHANICS, subcourse XII, *ten hours shop-work a week.*

One essay and one thesis required during the year.

A thesis is required for graduation, which must be submitted to the Professor of Rhetoric as well as to the Professor of Mechanical Engineering.

COURSE IN RAILWAY MECHANICS.

FRESHMAN YEAR.

The same as in the Civil Engineering Course.

SOPHOMORE YEAR.

The same as in the Mechanical Engineering Course.

JUNIOR YEAR.

The same as in the Mechanical Engineering Course.

SENIOR YEAR.

FALL TERM.

METALLURGY, subcourse I, Iron, etc., *full study.*
ENGINEERING, subcourse VI, Construction of Steam Engine, *full study.*
ENGINEERING, subcourse VI, Laboratory Work, *five hours a week.*

DRAUGHTING, subcourse V, Pumps, Locomotives, *ten hours a week.*
PRACTICAL MECHANICS, subcourse X, *five hours shop-work a week.*

WINTER TERM.

MECHANICS, subcourse VIII, Mechanics of Machinery, *full study.*
ENGINEERING, subcourse X, Theory and Construction of Locomotive, *full study.*
DRAUGHTING, subcourse V, Locomotive, *ten hours a week.*
PRACTICAL MECHANICS, subcourse XI, *ten hours shop-work a week.*
ASTRONOMY, subcourse II, Practical, *three-fifths study* (elective).

SPRING TERM.

MECHANICS, subcourse VIII, Mechanics of Machinery, *two-fifths study.*
ENGINEERING, subcourse XII, Railway Machinery, *full study.*
DRAUGHTING, subcourse V, Locomotive and Thesis, *fifteen hours a week.*
PRACTICAL MECHANICS, subcourse XII, *ten hours shop-work a week.*
ASTRONOMY, subcourse II, Practical, *three-fifths study* (elective).

Rhetorical work as for the Seniors in Mechanical Engineering.

ELECTRICAL ENGINEERING COURSE.

Freshman and Sophomore years the same as in the Mechanical Engineering Course.

JUNIOR YEAR.

FALL TERM.

ENGINEERING, subcourse III, Elements of Machines, *three-fifths study.*
MECHANICS, subcourse III, Analytical, *full study.*
PHYSICS, subcourses III and IV, Electricity and Magnetism, *full study.*
DRAUGHTING, subcourse III, Elements of Machines, *eight hours a week.*
PRACTICAL MECHANICS, subcourses VI and VII, *eight hours shop-work a week.*

WINTER TERM.

MECHANICS, subcourse III, Analytical, *full study.*
MECHANICS, subcourse V, Graphic Statics, *two-fifths study.*
APPLIED MECHANICS, subcourse IX, Thermodynamics, *full study.*
PHYSICS, subcourses III and IV, Electricity and Magnetism, *three-fifths study.*
DRAUGHTING, subcourse IV, Problems in Graphic Statics, *eight hours a week.*
PRACTICAL MECHANICS, subcourse VIII, *five hours shop-work a week.*

SPRING TERM.

ENGINEERING, subcourse VI, Theory of Steam Engine, *full study.*
MECHANICS, subcourse VI, Mechanics of Materials, *full study.*
PHYSICS, subcourses III and IV, Electricity and Magnetism, *two-fifths study.*
DRAUGHTING and laboratory work in Electricity, *ten hours a week.*
PRACTICAL MECHANICS, subcourse IX, *ten hours shop-work a week.*
Five essays and one oration required during the year.

SENIOR YEAR.

FALL TERM.

ELECTRICAL ENGINEERING, subcourse IV, Electricity and Magnetism, *full study.*
ENGINEERING, subcourse VI, Construction of Steam Engine, *full study.*
ELECTRICAL ENGINEERING, subcourse V, Dynamo testing and design, *full study.*
PRACTICAL MECHANICS, subcourse X, in the line of electrical machinery, *ten hours shop-work a week.*

WINTER TERM.

ENGINEERING, subcourse VIII, Hydraulic Motors, *three-fifths study.*
MECHANICS, subcourse VIII, Mechanics of Machines, *full study.*
ELECTRICAL ENGINEERING, subcourse V, Electricity and Magnetism, *full study.*
DRAUGHTING, subcourse V, Electrical Designs, *ten hours a week.*
PRACTICAL MECHANICS, subcourse XI, in the line of electrical machinery, *five hours shop-work a week.*

SPRING TERM.

MECHANICS, subcourse VIII, Mechanics of Machinery, *two-fifths study.*
ENGINEERING, subcourse VIII, Hydraulic Motors, *three-fifths study.*
ELECTRICAL ENGINEERING, subcourse V, Electricity and Magnetism, *full study.*
LABORATORY work in Electricity, *full study.*
DRAUGHTING, Electrical Designs, *ten hours a week.*
PRACTICAL MECHANICS, subcourse XII, in the line of electrical machinery, *ten hours shop-work a week.*

A thesis is required for graduation, which must be submitted to the Professor of Rhetoric as well as to the Professor of Electrical Engineering.

MINING ENGINEERING COURSE.

FRESHMAN YEAR.

The same as in the Civil Engineering Course.

SOPHOMORE YEAR.

FALL TERM.

CHEMISTRY, subcourse I, General, *full study.*
MATHEMATICS, subcourse VI, Calculus, *two-fifths study.*
MATHEMATICS, subcourse V, Analytic Geometry, *three-fifths study.*
MECHANICS, subcourse I, Elementary, *half study.*
DESCRIPTIVE GEOMETRY, subcourse I, Elementary, *half study.*
DRAUGHTING, subcourse II, Descriptive Geometry Problems, *ten hours a week.*

WINTER TERM.

CHEMISTRY, subcourse I, Qualitative Analysis, *full study.*
MATHEMATICS, subcourse VI, Calculus, *full study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
TOPOGRAPHICAL ENGINEERING, subcourse I, Elementary Surveying, *three-fifths study.*

SPRING TERM.

CHEMISTRY, subcourse I, Qualitative Analysis, *full study.*
MATHEMATICS, subcourse VI, Calculus, *full study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
TOPOGRAPHICAL ENGINEERING, subcourse I, Elementary Surveying, *full study.*

Essays and declamations weekly throughout the year.

Military drill from November 1st to May 15th. Military tactics (optional) in winter term.

JUNIOR YEAR.

FALL TERM.

MINERALOGY, subcourse I, Blowpipe Analysis, *three-fifths study.*
MINERALOGY, subcourse II, Crystallography, *two-fifths study.*
MECHANICS, subcourse III, Analytical, *full study.*
APPLIED MECHANICS, subcourse IV, Graphic Statics, *full study.*
DRAUGHTING, subcourse VII, Graphic Statics, *ten hours a week.*

WINTER TERM.

MINERALOGY, subcourse III, General, *two-fifths study.*
MINERALOGY, subcourse IV, Determinative, *three-fifths study.*
MECHANICS, subcourse III, Analytical, *full study.*
APPLIED ENGINEERING, subcourse V, Mine Engineering, *three-fifths study.*
DRAUGHTING, subcourse IX, Mines and Mine Timbering, *ten hours a week.*

SPRING TERM.

MINERALOGY, subcourse V, Descriptive, *two-fifths study.*
MINERALOGY, subcourse VI, Microscopical, *three-fifths study.*
APPLIED MECHANICS, subcourse VI, Mechanics of Materials, *one and two-fifths study.*
Elective study — To be chosen from the General List.
DRAUGHTING, subcourse IX, Mines and Mine Timbering, *ten hours a week.*
Five essays and one oration during the year.

SENIOR YEAR.

FALL TERM.

GEOLOGY, subcourse I, General, *full study.*
METALLURGY, subcourse I, Iron, etc., *full study.*
PSYCHOLOGY, or other elective, *full study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *ten hours a week.*

WINTER TERM.

ENGINEERING, subcourse V, Mine Engineering, *three-fifths study.*
GEOLOGY, subcourse III, Special, *three-fifths study.*
GEOLOGY, subcourse IV, Volcanic and Petrographic, *two-fifths study.*
ASSAYING, subcourse III, Dry Methods, *full study.*
ASTRONOMY, subcourse II, Practical, *three-fifths study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *five hours a week.*

SPRING TERM.

GEOLOGY, subcourse VI, Practical Field work, *three-fifths study.*
GEOLOGY, subcourse V, Applied, *full study.*
CONCENTRATION OF ORES, subcourse II, *three-fifths study.*
ASSAYING, subcourse II, Dry Methods and Bullion Assay, *full study.*
ASTRONOMY, subcourse II, Practical, *three-fifths study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *five hours a week.*
One essay and one thesis required during the year.

A thesis is required for graduation, which must be submitted to the Professor of Rhetoric as well as the Professor of Civil Engineering.

METALLURGICAL ENGINEERING COURSE.

FRESHMAN YEAR.

The same as in the Civil Engineering Course, except Mathematics, which are taken with the General Science Course.

SOPHOMORE YEAR.

FALL TERM.

CHEMISTRY, subcourse I, Lectures and Laboratory work, *full study.*
MATHEMATICS, subcourse V (p. 129), Analytic Geometry, *full study.*
MECHANICS, subcourse I, Elementary, *half study.*
DESCRIPTIVE GEOMETRY, subcourse I, Elementary, *half study.*
DRAUGHTING, subcourse II, Descriptive Geometry Problems, *ten hours a week.*

WINTER TERM.

CHEMISTRY, subcourse I, Qualitative Analysis, *full study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
TOPOGRAPHICAL ENGINEERING, subcourse I, Elementary Surveying, *three-fifths study.*

SPRING TERM.

CHEMISTRY, subcourse I, Qualitative Analysis, *full study.*
PHYSICS, subcourse II, Experimental Lectures, *full study.*
TOPOGRAPHICAL ENGINEERING, subcourse I, Elementary Surveying, *full study.*
DRAUGHTING, subcourse VI, Topographical and Platting, *five hours a week.*

Essays and declamations weekly throughout the year.

Military drill, from November 1 to May 15. Military tactics (optional) in winter term.

JUNIOR YEAR.

FALL TERM.

MINERALOGY, subcourse I, Blowpipe Analysis, *three-fifths study.*
MINERALOGY, subcourse II, Crystallography, *two-fifths study.*
CHEMISTRY, subcourse IV, Quantitative Analysis, *full study.*

WINTER TERM.

MINERALOGY, subcourse III, General, *two-fifths study.*
MINERALOGY, subcourse IV, Determinative, *three-fifths study.*
CHEMISTRY, subcourse IV, Quantitative Analysis, *full study.*
ASSAYING, subcourse II, Dry Method, *full study.*
DRAUGHTING, subcourse VI, Topographical and Platting, *five hours a week.*

COLLEGE OF ENGINEERING.

TIME TABLE—FALL TERM, 1891.

	M., W., F.—8—Tu., Th.	M., W., F.—9—Tu., Th.	M., W., F.—10—Tu., Th.	M., W., F.—11—Tu., Th.	M., W., F.—12—Tu., Th.	M., W., F.—2—Tu., Th.	M., W., F.—3—Tu., Th.
Prof. Bull	Draughting 2, 3, 5	Draughting 2, 3, 5	Des. Geom. 1	Engineering 6	Engineering 3		
Pres. Chamberlin					Geology 1		
Miss Gay					*French* 3		
Prof. Daniells						Chemistry 1, 3, 4	Chemistry 1, 3, 4
Prof. Davies					Physics 2		
Prof. Frankenburger				*Rhetoric* 4			
Prof. Frisby				*Hygiene*		Chemistry 1	Chemistry 1
Prof. Hillyer			Metallurgy 1			Mineralogy 2	Mineralogy 1
Prof. Hobbs				Mechanics 7			
Prof. Marx	Draughting 8	Draughting 8		Mechanics 4			
Prof. Hoskins	Draughting 7	Draughting 7	Mechanics 3			Prac. Mechanics 1, 2, 3, 6, 7, 10	Prac. Mechanics 1, 2, 3, 6, 7, 10
Prof. King	*Practical Mechanics* 1, 2, 3	*Practical Mechanics* 1, 2, 3					
Prof. Ransom			Mechanics 1. Mechanics 1.				
Mr. Richter	Draughting 2	Draughting 2	Des. Geom. 1				
Mr. Hinrichs	Draughting 2	Draughting 2					
Prof. Slichter			*Algebra* 1				
Miss Sterling					*German* 7		
Prof. Van Hise					Geology 1		
Prof. Van Velzer				Math'matics 5	Math'matics 6		

TIME TABLE—WINTER TERM, 1892.

	M., W., F.—8—Tu., Th.	M., W., F.—9—Tu., Th.	M., W., F.—10—Tu., Th.	M., W., F.—11—Tu., Th.	M., W., F.—12—Tu., Th.	M., W., F.—2—Tu., Th.	M., W., F.—3—Tu., Th.
Prof. Bull	Draughting 3, 4, 5	Draughting 3, 4, 5	Mechanics 8	Engineering 8	Engineering 3 Mechanics 5.		
Pres. Chamberlin					Geology 3		
Miss Gay					*French* 3		
Prof. Daniells						Chemistry 3, 4	Chemistry 3, 4
Prof. Davies			Physics 1		Physics 3, 4		
Prof. Palmer				*Elocution*			
Mr. Hinrichs	*Draughting* 1	*Draughting* 1		*Rhetoric* 4			
Prof. Frankenburger						Chemistry 1	Chemistry 1
Prof. Hillyer					Geology 4	Mineralogy 4 Mineralogy 3	Mineralogy 4
Prof. Hobbs				Engineering 4	Top'g. Eng. 1		
Prof. Marx	Draughting 8	Draughting 8	Engineering 2	Topo'gr Eng.	Topographical Engineer'g 3.		
Prof. Hoskins	Draughting 1, 6	Draughting 1, 6	Mechanics 3			Practical Mechanics 4, 5, 8, 11	Practical Mechanics 4, 5, 8, 11
Prof. King				Mechanics 9	Mechanics 10		
Prof. Ransom							
Prof. Slichter			*Trigono'try* 4 *Algebra* 2		*German* 7		
Miss Sterling				Mathematics 6			
Prof. Van Velzer							
Mr. Richter	*Draughting* 1	*Draughting* 1				Astronomy 2	
Prof. Comstock							

TIME TABLE—SPRING TERM, 1892.

	M., W., F.—8—Tu., Th.	M., W., F.—9—Tu., Th.	M., W., F.—10—Tu., Th.	M., W., F.—11—Tu., Th.	M., W., F.—12—Tu., Th.	M., W., F.—2—Tu., Th.	M., W., F.—3—Tu., Th.
Prof. Bull	Draughting 2, 3, 5	Draughting 2, 3, 5	Engineering 3 Mechanics 8.	Engineering 6	Engineer'g 8. Engineer'g 9.		
Pres. Chamberlin						Geology 6	Geology 6
Prof. Comstock					Astronomy 1	Astronomy 2	Astronomy 2
Miss Gay					*French* 3		
Prof. Daniells						Chemistry 3, 4	Chemistry 3, 4
Prof. Davies			Physics 1	Physics 3, 4			
Mr. Hinrichs		*Draughting* 1		*Draughting* 1		Topographical Engineeri'g 1	Topographical Engineeri'g 1
Prof. Hillyer						Chemistry 1	Chemistry 1
Prof. Hobbs				Engineering 1		Mineralogy 6 Mineralogy 5	Mineralogy 6
Prof. Marx	Draughting 4	Draughting 4	Mechanics 6			Topographical Engineer'g 1.	Topographical Engineeri'g 1
Prof. Hoskins						Mechanics 6	Mechanics 6
Prof. King						Practical Mechanics 5, 9, 12	Practical Mechanics 5, 9, 12
Prof. Ransom	*Descriptive Geometry*			*Descriptive Geometry*	Engineeri'g 7		
Mr. Richter	*Draughting* 2	*Descriptive Geometry* 1					
Prof. Slichter			*Antic Geo'* 5 *Trigono'try* 4		*German* 7		
Miss Sterling							
Prof. Van Hise	Geology 5						
Prof. Van Velzer				Mathematics 6			

Freshman studies in *Italics*.

SPRING TERM.

MINERALOGY, subcourse V, Descriptive, *full study.*
MINERALOGY, subcourse IV, Microscopical, *two-fifths study.*
CHEMISTRY, subcourse IV, Quantitative Analysis, *full study.*
ASSAYING, subcourse II, Dry Methods and Bullion Assay, *full study.*
DRAUGHTING, subcourse VI, Topographical and Platting, *five hours a week.*

Five essays and one oration during the year.

SENIOR YEAR.

FALL TERM.

GEOLOGY, subcourse I, General, *full study.*
CHEMISTRY, subcourse IV, Advanced, *full study.*
METALLURGY, subcourse I, Iron, etc., *full study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *ten hours a week.*

WINTER TERM.

GEOLOGY, subcourse III, Special, *three-fifths study.*
GEOLOGY, subcourse IV, Volcanic and Petrographic, *two-fifths study.*
CHEMISTRY, subcourse IV, Advanced, *full study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *five hours a week.*

SPRING TERM.

GEOLOGY, subcourse VI, Practical Field Work, *three-fifths study.*
GEOLOGY, subcourse V, Applied, *full study.*
ASTRONOMY, subcourse I, Descriptive, *full study.*
DRAUGHTING, subcourse X, Metallurgical Structures, *five hours a week.*

One essay and one thesis during the year.

A thesis is required for graduation, which must be submitted to the Professor of Rhetoric as well as the Professor of Metallurgy.

SUBCOURSES IN ENGINEERING.

DESCRIPTIVE GEOMETRY.

PROFESSOR BULL, PROFESSOR RANSOM AND MR. RICHTER.

Subcourse I, Elementary Descriptive Geometry. The topics taught embrace the projection of lines, planes, surfaces and solids, the intersection of each of these with any of the others, tangent lines to curves and surfaces and tangent planes to surfaces; problems in shade and shadows of lines and surfaces; linear perspective and isometric projection. The class-room exercises are accompanied by work in the draughting room. The text-book used is Watson's Descriptive Geometry. Full study during the spring term, Freshman year, and half study during the fall term, Sophomore year. (Profs. Bull and Ransom and Mr. Richter.)
Required of all Engineering Students.

Subcourse II, Advanced Descriptive Geometry. This study is taught by lectures and embraces principally the special method of central projection and its application to conic sections. It is accompanied by work in the draughting room. Three-fifths study in the winter term. (Prof. Bull.)

MATHEMATICS.

PROFESSOR VAN VELZER AND PROFESSOR SLICHTER.

Subcourse I, Algebra. Students having previously studied through quadratics in some elementary book are prepared to begin with the general theory of quadratic equations and quadratic functions, and from this point, the course includes progressions, arrangements and groups (permutations and combinations), binomial theorem, the theory of limits, undetermined co-efficients, derivatives, series and logarithms. The text-book used is Van Velzer and Slichter's Advanced Algebra, Part I. Five exercises a week during the fall term. (Prof. Slichter.)
Required of Freshmen in all courses.

Subcourse II, Algebra. This course includes imaginaries (treated by modern methods giving geometric constructions (discussion of rational integral functions of one variable (topics usually treated under the head of theory of equations), and solution of numerical equations of higher degrees. The text-book used is Van Velzer and Slichter's University Algebra. Two exercises a week during the winter term. (Prof. Slichter.)
Required of Freshmen in all courses except Metallurgical Engineering.

Subcourse III, Solid Geometry This course is not given in the College of Mechanics and Engineering. See page 128.

Subcourse IV, Trigonometry. In this course the ratio system is exclusively used. Text-book: Van Velzer and Slichter's Trigonometry and Tables. Three exercises a week during the winter term devoted to plane trigonometry, and two exercises a week during the spring term devoted to spherical trigonometry. (Prof. Slichter.)

Required of Freshmen in all engineering courses, except Metallurgical Engineering.

Subcourse V, Analytic Geometry. This course includes the straight line and conic sections, general equations of the second degree, and an introduction to geometry of three dimensions. Three exercises a week during the spring and fall terms. (Prof. Van Velzer or Prof. Slichter.)

Required of Freshmen and Sophomores in all engineering courses except Metallurgical Engineering.

Subcourse VI, Calculus. The calculus is founded on the method of limits. The course in differential calculus includes differentiation of explicit and implicit functions, expansion in series, and applications to indeterminate forms, maxima and minima, especially geometric maxima and minima. In integral calculus a thorough drill on elementary integrals and the integration of various classes of integrable functions is followed by the usual applications to curves, areas, volumes and centers of gravity, with especial emphasis placed on the use of single and double definite integrals. Two exercises a week during the fall term; five during the winter term, and five during the spring term. (Prof. Van Velzer.)

Required of Sophomores in all engineering courses except Metallurgical Engineering.

Students in Metallurgical Engineering take subcourses I, II, IV and V, described on page 128.

For subcourses VII to XVI, see Mathematics, page 129.

PURE AND APPLIED MECHANICS.

PROFESSOR MARX, PROFESSOR BULL, PROFESSOR RANSOM AND PROFESSOR HOSKINS.

Subcourse I, Elementary Mechanics. The aim is to impart clear notions of the elementary principles of mechanics, as a preparation for the study of physics, or the more advanced work in analytical mechanics. Correct notions of fundamental principles and of the language of the science are regarded as of greater importance than facility in the solution of problems by rule or formula. Text-book: Dana's Elementary

Mechanics. This must be preceded by subcourses I, II and IV in Mathematics. One-half study during the fall term. (Prof. Ransom.)
Required of Sophomores in all engineering courses.

Subcourse II, Elementary Mechanics. This course is similar in scope to subcourse I, but is designed more especially for students in the general courses. Text-book: Lock's Dynamics for Beginners. Three-fifths study during the fall term. (Prof. Hoskins.)
Required of Sophomores in General Science Course.

Subcourse III, Analytical Mechanics. During the fall term the work covers the main principles of the subject of statics. The work of the winter term deals mainly with the kinematics and dynamics of a particle, the principles of work and energy, and moments of inertia. In this course it is possible to develop only the beginnings of the science of analytical mechanics, but sufficient ground is covered to give the student of engineering a foundation for all ordinary technical applications of mechanics, and to furnish to those whose tastes lead them in that direction, a groundwork for future study of the more advanced theoretical portions of the subject. Text-book: Bowser's Elements of Analytical Mechanics. This must be preceded by subcourse I or II, in mechanics, and by subcourse VI, in mathematics. Full study during fall and winter terms. (Prof. Hoskins.)
Required of Juniors in all Engineering courses, except Metallurgical Engineering.

Subcourse IV, Graphic Statics (Civil Eng.) This subject is taught by text-book, supplemented by occasional lectures, developing special methods. It is accompanied by daily exercises in the draughting room in the construction of graphic stress diagrams of all the principal types of roof and bridge trusses in use. Full study during the fall term. (Prof. Hoskins.)
Required of Juniors in Civil and Mining Engineering.

Subcourse V, Graphic Statics (Mech. Eng.). This study is taught by lectures. The graphical method of determining strains and moments is first applied to frame structures, especially roof trusses, considering both the dead load and the wind pressure. The method is then applied to various pieces of machinery, especially the determination of the dimensions of shafts, axles, cranks, etc. The work in the recitation room is here largely supplemented by the work in the draughting room. Two-fifths study during the winter term. (Prof. Bull.)
Required of Juniors in Mechanical and Electrical Engineering.

Subcourse VI, Mechanics of Materials. This course embraces both theory and practice. The resistance and elastic properties of the most

important of the materials of engineering are studied from a theoretical standpoint, and the students are familiarized with those properties by tests made in the laboratory. The course must be preceded by subcourse III, analytical mechanics. Text-book: Merriman's Mechanics of Materials. Full study (theory) and two-fifths study (laboratory work) during the spring term. (Prof. Hoskins.)

Required of Juniors in all engineering courses except the course in Metallurgical Engineering.

Subcourse VII, Theory of Structures. This study having been preceded by a thorough training in the determination of stresses in all simple framed structures by the graphical method and the method of moments, and also by the study of the elements of the resistance of materials, the class-room work is confined to the study by text-book and lecture of the following topics:

(1.) The design and proportioning of the parts and joints of such simple framed structures. (2.) The theory of the continuous girder and its application to designs for swing bridges. (3.) The theory and design of solid and braced elastic arches and suspension bridges. Full study during the fall term. (Prof. Marx.)

Required of Seniors in Civil and Railway Engineering.

Subcourse VIII, Mechanics of Machinery. This study embraces the kinetics and kinematics of the different machines, and is essentially the mechanics of constrained motion. The subject is first treated in a general way, then numerous examples are taken from special machines, that the study may be of practical value to the student. Text-book: Kennedy's Mechanics of Machinery. Full study during the winter term, two-fifths study during the spring term. (Prof. Bull.)

Required of Seniors in Mechanical and Electrical Engineering.

Subcourse IX, Thermodynamics. This course covers those principles of the mechanical theory of heat which are a necessary preliminary to the study of the theory of heat engines. Text-book: Peabody's Thermodynamics of the Steam Engine. Full study during the winter term. (Prof. Ransom.)

Required of Juniors in Mechanical and Electrical Engineering.

Subcourse X, Thermodynamics. The same as subcourse IX, except that it is more limited in extent and somewhat more elementary. Text-book: Peabody's Thermodynamics of the Steam Engine. Three-fifths study during winter the term. (Prof. Ransom.)

Required of Juniors in Civil Engineering.

TOPOGRAPHICAL ENGINEERING.

PROFESSOR HOSKINS AND PROFESSOR MARX.

Subcourse I, Elementary Surveying This course embraces the theory of land surveying and leveling, and of the use and adjustment of the compass, transit and level, together with practice in the use of these instruments in the field. This must be preceded by the mathematics of Freshman year. Text-book: Johnson's Surveying. Three-fifths study during the winter term; one and two-fifths study during the spring term. (Sophomore year). (Prof. Marx.)

Required in Civil, Mining and Metallurgical Engineering Courses.

Subcourse II, Railroad and Topographical Surveying. During the winter term the main problems occurring in railroad location are taken up in the class-room, including methods of earth-work computation. The principal methods of topographical surveying are then studied. The work of the spring term consists mainly of field-work in topographical surveying, with plane-table and with transit and stadia. Much actual work of this kind has been done by the students in the past, including a very complete topographical map of the city of Madison, for sewerage purposes, and a topographical survey and plat of the State Fish Hatchery grounds, near Madison. This subcourse must be preceded by subcourse I, above given. Two-fifths study during the winter term. (Prof. Marx.)

Required of students in Civil Engineering.

Subcourse III, Geodesy and Method of Least Squares. This course includes a general discussion of the theory of errors and of their treatment by the method of least squares, followed by the theory of geodetic measurements and methods of computation. Full study during the winter term. (Prof. Hoskins.)

Required of Seniors in Civil Engineering

SPECIAL ENGINEERING.

PROFESSORS BULL, MARX, HOSKINS AND RANSOM.

Subcourse I, Sanitary Engineering. Lectures on water supply, sewerage, disposal of garbage, pavements and roads; visits to work finished and in process of construction. Full study during spring term. (Prof. Marx.)

Required of Seniors in Civil Engineering.

Subcourse II, Hydraulic Engineering. General principles of the mechanics of fluids. Discharge measurements through orifices, over weirs and

by means of floats and meters. Development of water power, theory of turbines, efficiency tests. Lectures and recitations. Apparatus for the hydraulic laboratory is being constructed. Full study during the winter term. (Prof. Marx.)
Required of Seniors in Civil and Railway Engineering.

Subcourse III, **Elements of Machines.** The lectures given furnish the necessary rules and formulas for calculating and designing the various elements of which machines are made up. Beginning with the immovable parts, like the rivet, the screw and the key, the course passes on to the movable parts, like the journal, the shaft, toothed gearing, pulleys, etc. The course is very complete, the theoretical as well as the practical elements being duly considered. Three-fifths study during the winter and spring terms (Sophomore year), and three-fifths study during the fall term (Junior year). (Prof. Bull.)
Required in the Mechanical and Electrical Engineering Courses.

Subcourse IV, **Masonry Construction.** Materials; preparing and using the materials; foundations; masonry structures, as dams, walls, piers, abutments, culverts and arches. Lectures and recitations. Three-fifths study during the winter term. (Prof. Marx.)
Required of Juniors in Civil Engineering.

Subcourse V, **Mine Engineering.** This course includes an account of the principal systems of mining, mine timbering, ventilation, drainage, blasting, haulage and underground surveying. Three-fifths study during the winter term.
Required of Seniors in Mining Engineering.

Subcourse VI, **Steam Engine.** This study extends through two terms. During the spring term, the theory of the steam engine and of the boiler is especially considered. Practical, yet scientifically correct, formulas for calculating the principal dimensions are given. During the fall term the subject is taught partly by lectures, partly by recitations. The steam engine is then considered more from the practical side. In connection with this study the students will, together with the professor, take part in a thorough test of some steam engine and of the boiler furnishing the steam. The department is now fully equipped for conducting these experiments. Text-books: Zeuner's Valve-Gearing, and Whitham's Steam Engine Design. Full study during spring and fall terms. Laboratory work as a half study during fall term of Senior year. (Prof. Bull.)
Required of Juniors and Seniors in Mechanical, Railway and Electrical Engineering.

Subcourse VII, **Steam Engine.** In this course practical rules for calculating the principal dimensions of an engine are given, and the stu-

dent is taught how to run an engine. The boiler is treated in the same practical way. Two-fifths study during the spring-term. (Prof. Ransom.)
Required of Juniors in Civil Engineering.

Subcourse VIII, Hydraulic Motors. This study is taught principally by recitation. The general subject of hydraulics is first taken up, in which the flow of water through orifices, pipes, canals, over weirs, etc., is determined, and the experimental co-efficients are discussed. After this, the hydraulic motors, especially the turbines, are treated in a systematic way. A short discussion of pumps finishes the study. It is the intention to have the students carry out hydraulic experiments in the laboratory which is being fitted up in Science Hall. Text-book: Weisbach's Hydraulics and Hydraulic Motors. Three-fifths study during the winter and spring terms. (Prof. Bull.)
Required of Seniors in Mechanical Engineering.

Subcourse IX, Hoisting Machinery. A series of lectures on the design of this class of machinery, giving practical rules for obtaining the required dimensions of the various parts. Two-fifths study during the spring term. (Prof. Bull.)
Required of Juniors in Mechanical Engineering.

Subcourse X, Theory and Construction of the Locomotive. This study coming after the theory and construction of the Steam Engine, only those parts will be treated in which the two subjects differ. The object of the course will be to teach the students to design a locomotive especially fitted to do a certain specified work. Full study during the winter term.
Required of Seniors in Railway Mechanics.

Subcourse XI, Hoisting, Pumping and Excavating Machinery. This course will be descriptive in its character, the purpose being to familiarize the students with the various machines used on a railway. Two-fifths study in the spring term.
Required of the Seniors in Railway Engineering.

Subcourse XII, Railway Machinery. In this course the student will be taught to design the various machines, as cranes, pumps, excavators, used by a railroad. Full study during the spring term.
Required of Seniors in Railway Mechanics.

Subcourse XIII, Economic Theory of Railroad Location. Taught by lectures and text-books. The student having previously gained an elementary knowledge of the general features of railroad construction, makes a study of the manner in which curves, grades, distance, etc., affect the first cost, operating expenses and receipts. A careful analysis of these items is made, and short equations deduced, showing

their probable value under any given set of conditions. Three-fifths study during the spring term.
Required of Juniors in Railroad Engineering.

Subcourse XIV, Railroad Field Work. The student is given two points to connect by rail, and is required to make a reconnoissance preliminary and final survey, and furnish maps, plans and estimates for the proposed road. The endeavor in this work is to accustom the student as far as possible to the conditions that he is likely to meet with in the actual practice of his profession. Taught by instruction during field work. Two-fifths study during the spring term. (Prof. Marx.)
Required of Juniors in Civil and Railroad Engineering.

Subcourse XV, The Locomotive and General Equipment. The student makes a study of the locomotive and its various types and their adaptation to different kinds of traffic. A few lectures are also given on the general equipment of railroads. Three-fifths study during the spring term.
Required of Seniors in Railroad Engineering.

Subcourse XVI, Construction and Maintenance of Way. This subject embraces the practical as well as the theoretical details of railroad construction, including tunneling, bridge work, foundations and retaining walls. Three-fifths study during the winter term and two-fifths during the spring terms.
Required of Seniors in Railroad Engineering.

ELECTRICAL ENGINEERING.

PROFESSOR DAVIES.

Except in cases of special arrangement with the professor, students will not be allowed to enter upon the special electrical courses until they have completed subcourse III in general physics. After this all their studies are directed with especial reference to their becoming practical working electricians and electrical engineers. They have access in the electrical laboratories to the best modern practical forms of of electrical measuring instruments, which they are taught how to to calibrate and verify, and occasionally, also, to construct; and such practical problems are assigned them as are most likely to bring out the difficulties they are likely to meet with in practice. Especial stress is laid upon the methods of refined electrical testing whereby an accomplished electrical engineer is enabled to save both time and money and foresee difficulties and advantages which may escape the uneducated. It is also sought to place the electrical engineering course upon a high

scientific plane, as one of the highest forms of applied science, embracing the entire range of higher physics. A high mathematical standard is insisted on, though in no degree to the displacement of experiment. In all respects it is aimed to place the course upon a high intellectual and educational plane as well as to make it thoroughly practical in the best sense of that term. Students have full access at all times to the leading electrical journals and published reports of electrical societies, which are kept on file in the laboratories of the University. The subcourses are as follows:

Subcourse II, the same as the general physics course.

Subcourse III, Elementary Laboratory Exercises, in testing resistances, currents, capacities, potentials, etc., by the usual methods. The text book used is Stewart and Gee's Practical Physics, Vol. II, Electricity and Magnetism. Ten hours per week, fall and winter terms, four hours a week, spring term.

Fall term required of Juniors in the Civil and Mechanical Engineering courses. Full course required of Juniors in the Electrical Engineering Course.

Subcourse IV, Advanced Laboratory Work, in electrical testing. Text books: Kempe's Hand-book of Electrical Testing. Ayrton's Practical Electricity. Special Problems in Electrical work. Full study, fall term.

Required of Seniors in the Electrical Engineering Course.

Subcourse V, Dynamo and Motor Testing and Design, accompanied by theoretical study. Text books: Sylvanus P. Thompson's Dynamo-Electric Machinery. Gray's Absolute Measurements in Electricity and Magnetism. Mascart and Joubert's Electricity and Magnetism, 2 vols. Fleming's Alternate Current Transformer, vol. I. Full study, winter and spring terms.

Required of Seniors in the Electrical Engineering Course.

DRAUGHTING.

PROFESSORS BULL, MARX, HOSKINS, MR RICHTER AND MR. HINRICHS.

Subcourse I. Elementary Drawing. The student is first taught the use of the brush in tinting various plane and curved surfaces with India ink; he then learns the well-known system of round writing, and the various kinds of lettering. The remainder of the time is spent by students in mechanical engineering in making a number of copies of details machines, and by the students in civil, mining and metallurgical engineering in topographical draughting with pen and colors. Ten hours a week during the winter term. (Prof. Hoskins, Mr. Richter and Mr. Hinrichs.)

Required of Freshmen in Engineering.

Subcourse II, Descriptive Geometry Problems. The instruction in the draughting-room follows closely the class-room work in descriptive geometry, and comprises a large number of problems relating to the different phases of the subject. Most of the problems are not found in the text-book and the student must solve them independently. Great stress is laid on the accuracy of the drawings, as well as on the character of the line work, as this study furnishes the best training for a future draughtsman. One hour daily during the spring term of the Freshman year, and two hours daily during the fall term of the Sophomore year. (Mr. Richter and Mr. Hinrichs.)
Required of all Engineers.

Subcourse III, Elements of Machines. In this course working drawings, mostly full size, are made of various elements of machines, as pillow-blocks, hangers, couplings, the various kinds of toothed gearing, spur, bevel and worm wheels, pulleys, etc. These details of machines are to a great extent designed by the student himself. The drawings are made in every particular so as to serve as working drawings in a factory. For the sake of gaining practice they are required to be tinted in the various conventional colors. The dimensions of the various parts are calculated. Eight hours a week during the winter and spring terms of the Sophomore year, and ten hours a week during the fall term of the Junior year. (Prof. Bull and Mr. Richter.)
Required of the Mechanical and Electrical Engineers.

Subcourse IV, Graphic Statics Problems. The problems studied in the class-room are worked out in the draughting-room with great accuracy, and the different pieces of machinery are drawn in detail. Eight hours per week during the winter term. (Prof. Bull.)
Required of Juniors in Mechanical Engineering.

Subcourse V, Machine Construction. The course embraces the designing and draughting of machinery, and is supplemental to the work in the class-room and the work-shop. At present one term and a half are spent in designing some kind of lifting machinery and a pump. The remainder of the time is occupied with the design of an automatic cut-off steam engine. Besides the general plan and an elevation of the machine designed, working drawings of the details of the various parts are required. During the fall term of the Senior year the students are also required to design some kind of model which they are to make in the machine shop before graduation. Eight or ten hours a week. (Prof. Bull.)
Required of the Mechanical Engineers during the last four terms of their course.

Subcourse VI, Topographical Draughting and Platting. Practice in mapping and in platting topographical and other surveys from field notes. Six hours per week during the winter term; five hours per week during the spring term (Sophomore year), and six hours per week during the spring term (Junior Year.) (Profs. Marx and Hoskins.)
Required of students in Civil Engineering.

Subcourse VII, Graphic Statics. The exercises in draughting required, are the accurate construction of complete stress diagrams of simple roof and bridge trusses of all the principal types, under the circumstances of actual practice. These are required to be made with precision and carefully finished. Ten hours a week, fall term. (Prof. Hoskins.)
Required of Juniors in Civil Engineering.

Subcourse VIII, Framed Structures. The work required in the draughting-room in addition to the class-room work is: (1.) Computing the size of all parts of one or two roof trusses, and making working and shop drawings of same. (2.) Computing the size of all parts of a bridge truss, and making working and shop drawings of same. (3.) Determination of stresses in a swing and an arch bridge, and complete design of one or both. Ten hours per week during winter term Junior year, and fall and winter terms Senior year. (Prof. Marx.)
Required of students in Civil Engineering.

Subcourse IX, Mines and Mine Timbering. This course accompanies and illustrates subcourse V, Mine Engineering. Ten hours per week during the winter and spring terms.
Required of Juniors in Mining Engineering.

Subcourse X, Metallurgical Structures. Drawing of furnaces and furnace plants. Given in connection with Metallurgy. Ten hours per week during fall term, and five hours a week during winter and spring terms.
Required of Seniors in Mining and Metallurgical Engineering.

PRACTICAL MECHANICS—MANUAL TRAINING.

PROFESSOR KING.

With the ample accommodations afforded by the machine shops, the instruction in all branches of this department is made thoroughly systematic and practical.

Subcourse I, Bench Work in Wood. A systematic course in the use of the plane, saw, gouge, bit and similar tools. It embraces such joint-work as is involved in building constructions and furniture. A short lecture precedes each new operation. First part of fall term, two hours per day, fifty hours.
Required of all Freshmen in Engineering.

Subcourse II, Machine Work in Wood. Systematic training in the use of the gouge and chisel in plain and ornamental turning in hard and soft wood. Middle of fall term, two hours per day, fifty hours.
Required of all Freshmen in Engineering.

Subcourse III, Pattern Work and Moulding. Practice in making patterns and in moulding. The selections of patterns are made with reference to best illustrating the principles involved in pattern construction and in the operations of moulding. Last part of fall term, two hours per day, fifty hours.
Required of all Freshmen in Engineering.

Subcourse IV, Hand Work in Iron. A systematic course in iron work with the hammer, chisel and file at the vise. Winter term, five hours weekly, sixty hours.
Required of Sophomores in Mechanical and Electrical Engineering.

Subcourse V, Surface Plate Work with File and Scraper. Systematic training in producing flat surfaces and lines of precision with the file and scraper. Spring term, five hours weekly, fifty hours.
Required of Sophomores in Mechanical and Electrical Engineering.

Subcourse VI, Forge Work. Training in all the fundamental features of forge work, as drawing, upsetting, bending, welding, tempering and tool making. Fall term, five hours weekly, sixty hours.
Required of Juniors in Mechanical and Electrical Engineering.

Subcourse VII, Machine Work in Iron. Practice on the engine lathes, in connection with which are taught the elementary features of boring, turning and screw cutting. Fall term, ten hours weekly, ninety hours.
Required of Juniors in Mechanical and Electrical Engineering.

Subcourse VIII, Tool Making. The methods of tap and die making for cutting screw threads are the leading features. Some instruction in brass work is also given. Winter term, five hours weekly, sixty hours.
Required of Juniors in Mechanical and Electrical Engineering.

Subcourse IX, Machine Construction. Practice in the manufacture of machinery, involving calculations of the cost of their production. Spring term, eight hours weekly, eighty hours.
Required of Juniors in Mechanical and Electrical Engineering.

Subcourse X, Machine Construction. The work of this course is similar to that of the preceding, but includes the use of plane-surfacing machines, and requires the highest skill of the student in fitting, etc. Fall term, ten hours weekly, last eight weeks, eighty hours.
Required of Seniors in Mechanical and Electrical Engineering.

Subcourse XI, Model Designing and Construction. Practice in the designing and the construction of models. The responsibility is imposed upon the student of designing some piece of machinery which is illustrative ofthe principles previously taught, and requires pattern work, moulding, forging and machine work. Winter term, ten hours weekly, one hundred and twenty hours.

Required of Juniors in Mechanical and Electrical Engineering.

Subcourse XII, Model Construction and Testing. The work in this course is devoted to completing and perfecting the models, and to such tests and experiments as will demonstrate the principles involved in them and develop their excellencies and defects. The field of invention is opened to the student in this and the preceding course. Spring term, ten hours weekly, eighty-five hours.

Required of Seniors in Mechanical and Electrical Engineering.

METALLURGY AND ASSAYING.

PROFESSOR HOBBS AND PROFESSOR HILLYER.

Subcourse I, Metallurgy. Text-books are used as a ground work of the course. The subject is illustrated by drawings, collections of ores and metallurgical products. Excursions are made to smelting establishments, and theses based upon actual operations are required of Metallurgical Engineering students for graduation. This course is chiefly devoted to the metallurgy of iron. *Full study, fall term.* (Prof. Hobbs.)

Required of all Seniors in Engineering.

Subcourse II, Assaying. Dry method and bullion assay. Gold and silver assays by both scorification and crucible methods. Gold and silver bullion assays. Lead and tin assays. Total number of duplicate assays about fifty. The theory of the subject is given by lectures, but most of the work is done in the laboratory. Full study during the winter and spring terms. (Prof. Hillyer.)

Required of students in the Mining and Metallurgical courses. Elective for Civil Engineering Seniors and scientific or other students who have had sufficient chemistry.

Text-books: Greenwood's Steel and Iron, Phillips' Manual of Metallurgy, Kerl's Assayer's Manual, Brown's Manual of Assaying.

GENERAL INFORMATION.

For general information regarding general policy, government, methods of work, libraries, scientific laboratories, museums and observatories, see pages 50 to 57. For subcourses in language, literature, science, etc., see pages 79 to 88. For information respecting charges, fees and other expenses, see page 146.

STUDENTS' ASSOCIATION.

The Association of Engineers, a society composed of students in engineering, is maintained with interest and affords excellent opportunities for the presentation and discussion of engineering topics and tends to stimulate independent work and to give breadth and variety of study. Its usefulness is increased by occasional lectures by members of the Faculty on subjects which have found no place in the prescribed course of study.

COLLEGE OF AGRICULTURE.

FACULTY.

THE PRESIDENT OF THE UNIVERSITY.
W. A. HENRY, Professor of Agriculture.
S. M. BABCOCK, Professor of Agricultural Chemistry.
F. H. KING, Professor of Agricultural Physics.
E. S. GOFF, Professor of Horticulture and Economic Entomology.
JOHN A. CRAIG, Professor of Animal Husbandry.
V. T. ATKINSON, Professor of Veterinary Science.
C. R. BARNES, Professor of Botany.
E. A. BIRGE, Professor of Zoology.
W. W. DANIELLS, Professor of Chemistry.
J. E. DAVIES, Professor of Physics.
C. A. VAN VELZER, Professor of Mathematics.
C. I. KING, Professor of Practical Mechanics.
D. B. FRANKENBURGER, Professor of Rhetoric.
W. H. ROSENSTENGEL, Professor of German.
C. R. VAN HISE, Professor of Archaean and Applied Geology.
J. A. COLE, Professor of Military Science and Tactics.
L. M. HOSKINS, Assistant Professor of Pure and Applied Mechanics.
H. W. HILLYER, Assistant Professor of Organic Chemistry.
H. B. LOOMIS, Instructor In Physics.
H. B. GURLER, Instructor in Butter Making.

OFFICERS OF EXPERIMENT STATION.

W. A. HENRY, Director.
S. M. BABCOCK, Chief Chemist.
F. H. KING, Professor of Agricultural Physics.
E. S. GOFF, Professor of Horticulture and Economic Entomology.
JOHN A. CRAIG, Professor of Animal Husbandry.
F. W. A. WOLL, Assistant Chemist.
J. W. DECKER, Fellow in Dairying.
S. R. BUCEY, Clerk and Stenographer.

W. H. MORRISON, Superintendent of Farmers' Institute.

GENERAL STATEMENT.

The systematic courses in agriculture have been arranged to meet the wants of students having different purposes in view.

The *Graduate Course* is intended to offer to advanced students those exceptional opportunities for professional training and original investigations which a thoroughly equipped and active Experiment Station, associated with numerous, amply furnished scientific laboratories, affords. Few institutions possess equal facilities for higher professional training in the agricultural sciences. The special lines of study will be left largely to the selection of the student, subject to the approval of the Faculty and the investigators of the Station. It will be practicable to a large extent to participate in experiments in progress, and, after suitable experience, to conduct independent investigations. When contributions to knowledge of permanent value are made they will be published through the bulletins of the Experiment Station under the name of the contributor. The graduates of other agricultural colleges and similar institutions will be entitled to the privileges of this course upon the presentation of their diplomas or proper certificates of graduation.

The *Long Course* offers a liberal and scientific training, and opens an avenue to a professional mastery of agriculture, agricultural chemistry and other special phases of the subject. Besides the strictly professional branches, it embraces chemistry, physics, botany, zoology, geology and similar sciences which have agricultural bearings. These constitute the foundation for special work in agricultural science. The field is so broad, however, that it is impossible for the student in four years to pursue all the subcourses offered, in addition to acquiring the necessary fundamental studies, and hence a large liberty of selection is allowed. Those who contemplate grain raising or horticulture as a special study or occupation, will naturally elect subcourses in botany to the exclusion of some in zoology, which have less close bearings upon their specialty; while the student who proposes to follow animal husbandry will elect work in zoology to the exclusion of a part of that in botany. Both courses will, however, embrace agricultural chemistry, which has an important bearing on all lines in agriculture. The student with no particular bent will elect subcourses of such character and variety as to give a general training in agriculture.

The special studies in agriculture are placed in the Senior year, by which time the student has taken the most of his strictly scientific studies, and is prepared to use advantageously his knowledge in its application to the art of agriculture.

The *Middle Course* is designed to rank with the course in Pharmacy, requiring about the same qualifications for admission and the same

time for its completion There seems to be a need for such a course, (1) whose terms of admission shall not be so high as to put it beyond the reach of those who have a good common school training, and (2) which shall require about the same time for its completion as has been found practicable to acquire in pharmacy, law and some other professional schools, and which can deal advantageously with youth from sixteen to twenty-five years of age, giving them a more thorough knowledge of agricultural science than the Short Course offers and at the same time a knowledge of the sciences which underlie agriculture and are allied to it.

The *Short Course* is adapted to those who have but limited preparation and can give but a short time to study, and who return immediately to active farm operations, and therefore desire the greatest amount of available and directly useful knowledge. A description of this course is given under its appropriate head among the courses of study.

The *Dairy Course* is designed to give practical instruction in butter and cheese making. For this purpose a dairy house is provided and equipped with the most approved apparatus for the separation of cream and the manufacture of butter and cheese. The equipment includes the Danish, Weston and De Laval separators, the new butter extractor and three hand separators adapted to the use of private dairies of twenty or thirty cows, also apparatus for deep setting. A new building especially designed for purposes of instruction, is being planned and it is expected that it will be completed before the next year. This will give greatly increased facilities for the work. The course of instruction extends through the winter term.

The *Experiment Station*, with its laboratories, barns and fields, offers most important advantages, and the student will have ample opportunity to familiarize himself with the methods of experimentation and the latest developments of agricultural science. The generous gift of the general Government of over half a million dollars yearly to the experiment stations of the several states and territories for experimental work is now available. Under this stimulus experimentation in agriculture has assumed a breadth, depth and importance impossible before. The station at the University is bearing its part in this enlarged work, and will be constantly informed of the results reached at other stations, so that students may study the progress made all over the Union.

By its association with amply equipped laboratories of science and the practical arts, with departments in which are taught all the foreign languages that contain much reliable agricultural literature, with an active Experiment Station, equipped with special laboratories and library, and with an experiment farm, where practical tests are carried on, guided by

experienced talent, the College of Agriculture affords exceptional opportunities to those who desire to become professional experts.

TERMS OF ADMISSION.

Graduate Course in Agriculture. Graduates of this university and of other colleges and universities of good standing are admitted to this course without examination.

Long Course in Agriculture. The following branches are required: English grammar, including sentential analysis and orthography; arithmetic, algebra through quadratics and plane and solid geometry; political and physical geography; history of the United States; natural philosophy, physiology and botany. Students from accredited schools will be admitted on the same basis as required for the General Science Course.

Middle Course in Agriculture. The requirements for admission to the middle course will be a good knowledge of the subjects required by law to be taught in the district schools of this state, viz.: reading, writing, arithmetic, geography, grammar, United States history, the constitutions of the United States and of Wisconsin, and physiology and hygiene.

For the present the University will accept certificates or diplomas of graduation from the full district school course, where these are given by county superintendents on the basis of examination. It will also accept, for the present, full third grade teachers' certificates issued by county superintendents. Students presenting these will be admitted without examination, but if it shall subsequently appear that they are deficient in any subject required for entrance to such an extent as to seriously interfere with their progress, they will be required to make this subject up.

Short Course in Agriculture. Students in this course must be at least sixteen years of age, and have a good common school education. Although no entrance examinations are required, if one comes poorly prepared he cannot expect the full benefits of the course.

Course in Dairying. The terms of admission to this course will be the same as for the Short Course.

SPECIAL STUDENTS IN AGRICULTURE.

As many of the youth of the farming communities are not within reach of schools giving instructions in all the branches required for admission to the Long Course, limited concessions will be made to young men of exceptional strength and maturity, by which they will be permitted to enter the University as special students in Agricul-

ture. These concessions, however, will only be made to students whose situation does not afford them adequate means for preparation, and who, in good faith desire to pursue the Agricultural Course. Such concessions will necessarily be very limited, because there must be a close approach to full preparation upon the several branches named to enable the student to go on advantageously with the course.

COURSES OF STUDY.

LONG COURSE IN AGRICULTURE.

FRESHMAN YEAR.

FALL TERM.

VEGETABLE MORPHOLOGY, subcourse II, *full study.*
MATHEMATICS, subcourse I, Advanced Algebra, *full study.*
GERMAN, subcourse V, *full study.*

WINTER TERM.

AGRICULTURAL PHYSICS, subcourse II, *full study.*
MATHEMATICS, subcourse II, Advanced Algebra, *full study.*
GERMAN, subcourse V, *full study.*

SPRING TERM.

VEGETABLE HISTOLOGY, subcourse IV, *full study.*
MATHEMATICS, subcourse IV, Trigonometry, *full study.*
GERMAN, subcourse V, *full study.*

Class rhetorical exercises once a week during the year. Military drill throughout the year.

Hygiene as a two-fifths study in the winter term.

Elocution as a three-fifths study for the fall term.

SOPHOMORE YEAR.

FALL TERM.

CHEMISTRY, subcourse I, *full study.*
GERMAN, subcourse VI, *full study.*
ELEMENTARY MECHANICS, subcourse II, *three-fifths study.*
PRACTICAL MECHANICS, subcourses I, II and III, *two-fifths study.*

WINTER TERM.

CHEMISTRY, subcourse I, Qualitative Analysis, *full study.*
GERMAN, *elective, full study.*
PHYSICS, subcourse II, *full study.*
ANIMAL MORPHOLOGY, subcourse II, *full study.*

SPRING TERM.

CHEMISTRY, Quantitative Analysis, *full study.*
GERMAN, *elective, full study.*
PHYSICS, subcourse II, *full study.*
ANIMAL MORPHOLOGY, subcourse II, *full study.*,

Class rhetorical exercises once a week during the year. Military drill November 1 to May 15.

JUNIOR YEAR.

FALL TERM.

CHEMISTRY, Quantitative Analysis, *full study.*
VEGETABLE PHYSIOLOGY, subcourse V, or Zoology, subcourse IV or V, *full study.*
AGRICULTURAL PHYSICS, subcourse I, *two-fifths study.*
HUMAN PHYSIOLOGY, subcourse VI, *three-fifths study.*

WINTER TERM.

CHEMISTRY, Quantitative and Agricultural Chemistry, *full study.*
VEGETABLE PHYSIOLOGY, subcourse V, or Zoology, subcourse IV or V, *full study.*
HUMAN PHYSIOLOGY, subcourse VI, *three-fifths study.*
AGRICULTURAL PHYSICS, subcourse I, *three-fifths study.*
VETERINARY SCIENCE, *three-fifths study, elective.*

SPRING TERM.

AGRICULTURAL CHEMISTRY, *full study.*
VEGETABLE PHYSIOLOGY, subcourse V, or Zoology, subcourse VII, *full study.*
AGRICULTURAL PHYSICS, subcourse III, *two-fifths study.*
ENTOMOLOGY, *full study.*

Five essays and one oration during the year.

SENIOR YEAR.

FALL TERM.

AGRICULTURAL CHEMISTRY, *full study, elective.*
AGRICULTURAL PHYSICS, *three-fifths study, elective.*
GEOLOGY, subcourse III, *full study, elective.*
POLITICAL ECONOMY, subcourse X, *full study, elective.*
HORTICULTURE, *elective.*
BOTANY AND ZOOLOGY, *elective.*

WINTER TERM.

ANIMAL HUSBANDRY, *full study, required.*
AGRICULTURAL CHEMISTRY, Special Investigations, *elective.*
HORTICULTURE, Special Investigations, *elective.*
AGRICULTURAL PHYSICS, Special Investigations, *elective.*
BOTANY AND ZOOLOGY, *elective.*

SPRING TERM.

ANIMAL HUSBANDRY, Lectures and Special Investigations, *full study, required.*
ECONOMIC ENTOMOLOGY, *elective.*
AGRICULTURAL CHEMISTRY, Special Investigations, *elective.*
AGRICULTURAL PHYSICS, Special Investigations, *elective.*
HORTICULTURE, Special Investigations, *elective.*
BOTANY AND ZOOLOGY, *elective.*

Three essays and one oration during the year.

MIDDLE COURSE IN AGRICULTURE.

FIRST YEAR.

First Phase.
Agricultural Physics.
Agricultural Botany.
Shop Practice.
Feeding and Breeding.
Horticulture.

Second Phase.
Agricultural Physics.
Agricultural Botany.
Shop Practice.
Algebra.

SECOND YEAR.

First Phase.
Agricultural Chemistry.
Economic Entomology.
Dairy Practice.
Field and Garden Experiments.
Veterinary Science.

Second Phase.
Agricultural Chemistry.
Economic Entomology.
Geometry, Plane and Solid.

SHORT COURSE IN AGRICULTURE.

The subjects in this course are wholly elective, and are designed to occupy the student during the winter terms of two years.

This course embraces the following:

Thirty lectures, mainly devoted to Feeds and Feeding, by Professor Henry.

Thirty lectures on Breeds and Breeding, by Professor Craig.

Sixty lectures on the Elements of Agricultural Chemistry, by Professor Babcock.

Sixty lectures and recitations on Agricultural Physics and Meteorology, by Professor King.

Sixty lectures on Horticulture and Economic Entomology, by Professor Goff.

Thirty-six lectures on the Anatomy of Domestic Animals, by Professor Atkinson.

Practical Mechanics, one hundred and twenty hours, by Professor King.

COURSE IN DAIRYING.

SUBCOURSE I.—LECTURES.

This subcourse comprises about twenty lectures by Dr. Babcock, upon the constitution of milk, the conditions which affect creaming and churning, the various methods of milk-testing, the preservation of milk and other allied subjects.

Required of all dairy students.

SUBCOURSE II.—MILK TESTING.

Laboratory instruction will be given daily commencing at the beginning of the term and continuing about four weeks. For this purpose a commodious laboratory is provided which is equipped with Patrick's, Babcock's and other simple tests which may be operated without a chemical training.

Required of all students who take subcourses III and IV.

SUBCOURSE III.—BUTTER MAKING.

This will consist of practical instruction in butter making under the direction of a competent instructor.

The work will begin at the commencement of the term and continue about eight weeks.

Subcourses I and II must be taken in connection with this work.

SUBCOURSE IV.—CHEESE MAKING.

The aim of this course will be to give practical instruction in cheese making adapted both to beginners and to experienced makers.

Subcourses I and II must be taken with this work.

DAIRY CERTIFICATES.

Upon request of any student a written statement, signed by his instructors, will be furnished, stating just what work he has taken and his standings as shown by the examinations.

A student who has taken the whole dairy course and who has conducted a commercial cheese factory or creamery for a season of not less than eight months, will upon application, if located within the state or at a point that is readily accessible, be visited by a properly authorized person, and if his work is found satisfactory will be granted a dairy certificate under the seal of the University.

Circulars giving further information will be sent upon application.

SUBCOURSES.

ANIMAL HUSBANDRY.

PROFESSOR HENRY.

Subcourse I, Feeds and Feeding. In this subcourse attention is directed to the chemical constituents of feeding materials, and the amount, combination and form of these, necessary to give the best results with the various kinds of livestock. The student will be required to familiarize himself with the German feeding tables, and to compound theoretical rations in accordance with their teachings. The feeding trials conducted at our own station and others in this country will be considered so far as the limited time permits, in order to illustrate the work. Instruction will be given in the improved methods of growing, storing and preparing the leading forage crops of this section. Silos and silage, cooking and grinding feed, and the best forms of compounding the various food articles are likewise subjects for consideration. Attention will be given to the source, composition and best ways of feeding the numerous by-products of certain manufacturing establishments, such as skim-milk, whey, glucose meal, starch refuse, malt sprouts, oil

meal, etc. The effects of different feeds upon the quality of the bone, flesh, milk, wool, etc., will also be considered.

Subcourse II, Advanced Work in Feeding. The large number of investigations in feeding carried on in this country and the old world, gathered into the reports of the experiment stations and other publications, make it necessary for anyone who would have a broad knowledge of the subject to spend more time upon it than is given in Subcourse I. In the advanced work a portion of the time will be given to a study of the subject as presented in Armsby's Manual of Cattle Feeding, which will serve as the text book. Another part of the work requires the student to make a full and carefully arranged report of some line of feeding experiments as given in the publications of the experiment stations of this country. Lastly, he will assist in conducting feeding experiments in our own station, giving special attention to recording, arranging, condensing, comparing and discussing the figures obtained.

As aids to these courses, our agricultural library contains the reports and bulletins of all our experiment stations, as well as many of those of the English and German investigators. In our museum is a collection of grasses and forage plants; also samples of leading by-products used as feeds, such as cotton seed meal, cotton seed hulls, oil cake, dried brewers' grains, malt sprouts, etc. At the farm the experiments in progress are made free use of to help in teaching.

The subcourses are required of all students in agriculture.

ANIMAL HUSBANDRY—BREEDS AND BREEDING.

PROFESSOR CRAIG.

Students taking this course are trained in judging live-stock by the use of typical animals, skeletons, charts and models. Lectures are given on the origin, characteristics and utility of the principal breeds. The student is made familiar with the leading features of pedigreed stock breeding, and carefully trained in extending and valuing pedigrees through the use of numerous herd and stud books. The principles of breeding (heredity, fecundity, etc.), the methods of breeding (line-breeding, in-breeding, cross-breeding, etc.), and the practice of breeding (horse, cattle, sheep and swine breeding), will receive due consideration.

As aids to the instruction it is designed to have at the University farm pure bred animals, representative of the leading breeds of cattle, sheep and swine. The students will also visit stock farms in the vicinity of Madison. The lecture room is provided with an electric lantern for projecting slides upon a screen, and about 300 photographs, many of them representing noted animals of the several breeds, will be used for

instruction. The agricultural library is already quite complete in the various sets of American stud books, herd books, registries, pedigree and transfer certificates, score cards and other sources of information pertaining to the registration of pure bred stock.

AGRICULTURAL CHEMISTRY.

PROFESSOR BABCOCK.

Instruction in Agricultural Chemistry is given by lectures, recitations and laboratory practice. The course includes the following general subjects:

(1) The chemical and physical relations of the soil, water and air to plant development; the influence of tillage, drainage, etc.

(2) Manures, their classification, composition and valuation; manurial values of fodders; production, care and application of stable manure; commercial fertilizers.

(3) The composition and feeding value of crops and fodders.

(4) The chemistry of the dairy, the composition and physical properties of milk and its manufactured products; the principles involved in modern dairy practice; detection of adulterations, etc.

(5) Fermentation and decay.

In connection with the lectures, laboratory practice is provided to familiarize the student with the characteristic properties of different varieties of soils and manures; the methods of testing milk, butter and cheese, and other work according to the attainments and needs of the student. In addition, a course of reading is required under the direction of the professor, which comprises work upon the application of science to agriculture.

Required of all students of agriculture.

VETERINARY SCIENCE.

PROFESSOR ATKINSON.

It is intended by this course to impart such general knowledge of veterinary science as will enable the student to meet intelligently such emergencies as frequently arise among live stock and require prompt action, and to co-operate understandingly with the qualified practitioner It will also be of service as preliminary instruction for those who contemplate entering any of the regular veterinary colleges, as the course will comprise an outline of all the principal branches of the science. The lectures will be illustrated by a very complete set of skeletons, charts, models, specimens, etc. Among these is one of the Auzoux anatomical models of the Arab horse, which is so constructed that it can be dissected to show over 3,000 anatomical parts.

AGRICULTURAL PHYSICS.

PROFESSOR KING.

Subcourse I. This course will consist of recitations and lectures relating to the following topics: (1) Origin, physical properties and classification of soils. (2) Relation of water to soil. (3) Movements of water in soil. (4) Relation of air to soil. (5) Soil temperatures. (6) Land drainage. (7) Wells and water supplies. (8) Farm buildings. (9) Farm machinery. (10) Construction and maintenance of roads.

Subcourse II, Meteorology and Climatology.

Subcourse III, Laboratory Work and Special Investigation.

Required of all long course students in agriculture.

HORTICULTURE AND ECONOMIC ENTOMOLOGY.

PROFESSOR GOFF.

Subcourse I. The instruction in this course will be given under the following heads:

(1) Pomology. Methods of propagating, planting, cultivating and pruning fruit trees and plants, and of harvesting, marketing and preserving the fruits of our climate.

(2) Vegetable Gardening. Similar instruction given in market and kitchen gardening, including the construction and management of hotbeds, forcing pits, etc.

(3) Horticulture. Instruction in the culture and adaptation of the principal plants grown in the flower-garden and green-house.

(4) Landscape Gardening. The principles of ornamental planting and the art of laying out gardens and pleasure grounds, with the formation and management of lawns.

(5) Seed Growing and Plant Breeding. The culture and management of the various garden vegetables for the production of seed, with instructions on the principles of selection and the art of cross-fertilization with the view of improving varieties; lectures and laboratory practice

Required of all long course students in agriculture.

Subcourse II, Economic Entomology. Injurious and beneficial insects and the means of preventing insect ravages. Lectures and laboratory work.

Required of all long course students in agriculture.

Subcourse III, Laboratory, Field and Garden Practice, embracing topics named in courses I and II.

THE AGRICULTURAL EXPERIMENT STATION.

The purpose of the Station is the promotion of agricultural science by investigation and experimentation. In the choice of subjects it endeavors to select those which possess the greatest importance to the farmers of this state, so far as its facilities permit. At the same time it endeavors to give its investigations so careful and fundamental a character as to make their results real contributions to agricultural science, of wide and lasting value. The Station is also a means of disseminating general and miscellaneous information on agricultural topics, and its staff cheerfully devotes the necessary time to private and public correspondence and to personal interviews.

Specimens of weeds and introduced plants of questionable value, of cultivated and other plants attacked by fungi (rusts, smuts, mildews, etc.), and of noxious and beneficial insects, will be examined. The names of unknown plants and insects, together with information as to the best means of dealing with them, will be gladly given, so far as possible.

Samples of farm and garden seeds, when taken according to the Station's instructions, will also be examined as to purity and vitality; and, in general such chemical and botanical work as is of general interest will be undertaken free of charge so far as the facilities of the Station will permit.

The offices and laboratories of the Station are in Agricultural Hall, on the University grounds. The farm, with the experimental grounds and buildings, adjoins the University grounds on the west.

BULLETINS.

Twenty-six bulletins have been issued, four of which have appeared during the current academic year. Bulletin No. 16, of fourteen pages, relating to "A New Method of determining Fat in Milk." Bulletin No. 17, of twenty-five pages, "A Report on Corn, Oats, Barley and Potatoes: Grape Growing." Bulletin No. 18, of thirty-five pages, on "The Constitution of Milk, and Some of the Conditions Which Affect the Separation of Cream." Bulletin No. 19, of twenty-eight pages, "Notes on Ensilage." Bulletin No. 20, of twenty-nine pages, "Noxious Weeds of Wisconsin." Bulletin No. 21, of thirty pages, "Comparative Value of Warm and Cold Water for Milch Cows in Winter." Bulletin No. 22, of twelve pages, "Report on Oats, Barley and Potatoes for 1889." Bulletin No. 23, of eleven pages, "Prevention of Apple-Scab." Bulletin No. 24, of eighteen pages, "A New Method for the Estimation of Fat in Milk, especially adapted to Creameries and Cheese Factories." Bulletin No. 25, of ten

pages, "Feeding Bone Meal and Hard Wood Ashes to Hogs Living on Corn." Bulletin No. 26, of thirty-two pages, "Sugar Beet Culture in Wisconsin."

SEVENTH ANNUAL REPORT.

The Seventh Annual Report was issued in December. It consists of two hundred and eighty pages devoted to the following subjects: Experiments with sheep; experiments with hogs; ground oats vs. bran for milk and butter production; corn silage vs. dry fodder corn for milk and butter production; a new method for the estimation of fat in milk, especially adapted to creameries and cheese factories; investigations relating to the composition of milk; some effects produced by rolling ground; soil water; the comparative value of warm and cold water for milch cows; plan of a barn for a dairy farm; prevention of apple scab; the comparative vitality of hulled and unhulled timothy seed; potato: test of varieties, and report of experiments; notes on strawberries; comparison of siloing and field-curing fodder corn; the number and size of fat globules in cows' milk, etc.

GENERAL INFORMATION.

LABORATORY FACILITIES.

The laboratory facilities of the College of Agriculture consist of the Experiment Station chemical laboratory, 40 x 42 feet, designed and equipped for the use of the Station chemists, and for students doing advanced work under their direction; a students' chemical laboratory, 24 x 40 feet, fitted with desks and apparatus for thirty-two students, and designed to accommodate students in the Short Course in Agriculture; a physical laboratory occupying two rooms, each 20 x 40 feet, one of which is fitted with tables for thirty students and designed to accommodate Short Course students in Agriculture, and a horticultural laboratory 17 x 40 feet equipped for experimental and instructional purposes.

A new building especially designed for purposes of instruction in dairying is being planned, and it is expected that it will be completed and equipped with the most approved appliances for practical instruction in the manufacture of butter and cheese before next year.

Besides these facilities the College of Agriculture has at its command, for the use of its students, the general laboratory facilities of the University, so far as they relate to general chemistry, physics, practical mechanics, biology, geology, etc., see pages 51–56, 149–151.

LIBRARIES.

The Agricultural Library contains about 1,200 bound volumes and several hundred pamphlets, all of which are available for the use of students. They have access also to the various other libraries of the University and the city, see page 51.

SOCIETIES.

Two societies are maintained, one by the students of the several agricultural courses, and one by those of the course in dairying. These organizations afford valuable opportunities for the discussion of the many professional and practical questions concerning agriculture and dairying.

FEES AND EXPENSES.

Tuition for residents of the state of Wisconsin,	Free.
Tuition for non-resident students in all courses per term,	$6.00
Incidental fees for students in all courses,	
First term,	5.00
Second term,	5.00
Third term,	2.00

Students will be charged for not less than one term, and no deductions will be made for voluntary absence.

Students working in laboratories are required to pay a fee to cover the cost of materials and instruments used by them. When this cannot be fixed beforehand, a deposit sufficient to cover the probable cost is required and an account is kept, and the amount of deposit not used is returned to the student at the close of his term of study in the laboratory.

ROOMS AND BOARD.

Rooms furnished and unfurnished can be obtained in the city at reasonable rates. The cost of board in clubs is from $2.00 to $2.50 per week; in private families, from $3.00 to $4.00 per week. Washing costs from sixty to seventy-five cents per dozen.

AGRICULTURAL INSTITUTES.

Through special legislative provisions, a carefully supervised system of Farmers' Institutes is maintained under the auspices of the University. It is placed in the immediate charge of a Superintendent, who elaborates and controls the organization and execution of all the institutes. He is aided by special conductors who assist in perfecting the details and carrying the whole into effect.

The Director of the Experiment Station and the members of the Agricultural Faculty, render as much assistance as is consistent with their other duties, directing their efforts chiefly to the discussion of the practical problems affected by the experiments of the Station, and the educational work of the University. Experts in different departments are engaged to present special important themes. Local talent is freely used, and not the least of the educational benefits is the development of latent ability in writing, speaking and experimenting which has followed as an incidental result.

LIST OF FARMERS' INSTITUTES.

The following is a list of the sixty-one institutes held during the current collegiate year:

PLACES.	COUNTIES.	PLACES.	COUNTIES.	PLACES.	COUNTIES.
Rice Lake.....	Barron.	Monroe.....	Green.	Caldwell	Racine.
Chetek.....	Barron.	Brooklyn.....	Green.	Richla'd Cent'r	Richland.
Green Bay.....	Brown.	Markesan . . .	Green Lake.	Edgerton.....	Rock.
Alma.....	Buffalo.	Barneveld.....	Iowa.	New Richm'nd	St. Croix.
New Holstein..	Calumet.	Mineral Point.	Iowa.	Prairie du Sac.	Sauk.
Hilbert Junct'n	Calumet.	Alma Center..	Jackson.	Spring Green..	Sauk.
Bloomer.....	Chippewa.	Lake Mills....	Jefferson.	Shawano.....	Shawano.
Neillsville	Clark.	Watertown....	Jefferson.	Waldo.....	Sheboygan.
Colby	Clark.	Elroy..	Juneau.	Franklin	Sheboygan.
Columbus.....	Columbia.	Necedah.....	Juneau.	Galesville	Tremp'leau.
Cambria	Columbia.	West Salem...	La Crosse.	Blair	Tremp'leau.
Kilbourn City..	Columbia.	Darlington	La Fayette.	Osseo.....	Tremp'leau.
Sun Prairie.....	Dane.	Manitowoc	Manitowoc.	Delavan.....	Walworth.
Belleville.....	Dane.	Packwaukee ..	Marquette.	West Bend....	Washingt'n.
Juneau.....	Dodge.	Sparta.	Monroe.	Oconomowoc..	Waukesha.
Knapp	Dunn.	Hortonville....	Outagamie.	Hancock	Waushara.
Ripon	Fond du Lac	Pt. Washingt'n	Ozaukee.	Omro.....	Winnebago.
Lancaster.....	Grant.	Durand.....	Pepin.	Grand Rapids.	Wood.
Fennimore.....	Grant.	Rock Elm.....	Pierce.	Waupaca.....	Waupaca.
Muscoda	Grant.	Clear Lake ...	Polk.		
Bloomington...	Grant.	Plover.	Portage.		

LIST OF INSTITUTE SPEAKERS.

W. H. MORRISON, SUPERINTENDENT.

Hon. J. M. True,	Baraboo.
Geo. Wylie,	Leeds.
Weldon Vankirk,	Rush Lake.
Geo. McKerron,	Sussex.
T. J. Flemming,	Watertown.
Thos. Convey,	Ridgeway.
A. O. Fox,	Oregon.
W. H. Cole,	Waterloo.
E. O. Wheelock,	Brooklyn.
C. H. Everett,	Beloit.
J. M. Smith,	Green Bay.
C. P. Goodrich,	Fort Atkinson.
Prof. W. A. Henry,	Experiment Station.
Prof. S. M. Babcock,	" "
Prof. F. H. King,	" "
Prof. E. S. Goff,	" "
F. W. A. Woll,	" "
L. H. Adams,	" "

PUBLICATIONS.

To disseminate still more widely a representative portion of the matter presented and discussed at the Institutes, and to give it permanency for its own sake and for its historical value, a system of publication in the form of bulletins has been begun by the Superintendent.

Bulletin No. 4, thirty-one thousand copies of which were issued during the year, consists of the proceedings, papers and discussions of the closing institute of the series, and gives a fair idea of the work performed. It makes a volume of 336 pages.

THE COLLEGE OF LAW.

FACULTY.

THE PRESIDENT OF THE UNIVERSITY.

EDWIN E. BRYANT, Dean of the Faculty.

I. C. SLOAN, Counselor-at-Law, Professor of Equity, Jurisprudence and Real Property.

JOHN B. CASSODAY, Associate Justice of the Supreme Court of Wisconsin, Professor of Constitutional Law and Wills.

J. H. CARPENTER, LL. D., Mortimer Jackson Professor, Professor of Contracts and Torts.

WM. F. VILAS, LL. D., Professor of Practice and Pleading.

BURR W. JONES, LL. B., Professor of the Law of Evidence, Corporations, and Domestic Relations.

GEO. H. NOYES, Counselor at Law, Special Lecturer on Common Carriers.

JAMES G. JENKINS, Judge United States District Court, Eastern District of Wisconsin. Special Lecturer on Negligence.

SAMUEL D. HASTINGS, JR., Judge of the 4th Judicial Circuit of Wisconsin. Special Lecturer on Taxation.

HENRY B. FAVILL, M. D., Special Lecturer on Medical Jurisprudence.

GENERAL STATEMENT.

The superior advantage of professional schools for the rapid and thorough elementary training of professional men has long since been demonstrated. Especially has the legal profession acknowledged the superiority of such schools over other methods of preparation for the practice of the law.

The views generally entertained by lawyers on this subject are well expressed in the report of the standing committee of the American Bar Association on legal education and admission to the bar, made in 1881, which was unanimously adopted by the Association. The committee says:

"There is little, if any, dispute now, as to the relative merit of education by means of law schools, and that to be got by more practical training or apprenticeship as an attorney's clerk. Without disparagement of more practical advantages, the verdict of the best informed is in favor of the schools.

"The benefits which they offer are easily suggested and are of the most superior kind. They afford the student an acquaintance with general principles, difficult, if not impossible to be otherwise attained; they serve

to remove difficulties which are inherent in scientific and technical phraseology; and they, as a necessary consequence, furnish the student with the means for clear conception and accurate and precise expression. They familiarize him with leading cases and the application of them in discussion; they give him the valuable habit of attention, teach him familiar maxims, and offer him the priceless opportunities which result from contact and generous emulation. They lead him to readily survey law as a science, and imbue him with the principles of ethics as its true foundation. Disputing, reasoning, reading and discussing, become his constant exercises."

The law is the growth of many centuries. Its literature is very voluminous, and but few students can, by reading the books alone, in the beginning of their studies, make much progress. The student in a law office, at the present time, rarely receives much instruction from the lawyer, and such as he receives is likely to be desultory and never systematic. He is confused by reading much that is obsolete and contradictory, and gropes his way, without order in his studies or much benefit from his reading.

While it is not claimed that in a course of two years, a student can become a thoroughly equipped lawyer, yet he can derive from the law-school such assistance as to give him many years advantage over one who relies upon study in a law-office and such instructions as he may there receive.

The beginner needs to gain a comprehensive general view and analysis of the whole system of law, a knowledge of the elementary principles and of the methods of legal proceedings; where to search in the books for more detailed information, and to acquire the habit of legal study and ready analysis. This degree of attainment can, especially in the present condition of the legal profession, be reached in the professional school more thoroughly, systematically and rapidly than elsewhere.

The College of Law of the University of Wisconsin, after many years of experience, has developed a course of unusually practical merit, which is rendered effective by facilities for instruction and advantages of location of an exceptional order.

THE MORTIMER JACKSON PROFESSORSHIP OF LAW.

By the generous provisions of the will of the late Judge Mortimer M. Jackson, funds to the amount of twenty thousand dollars were bequeathed to the University to found and maintain a Professorship of Law. In accordance with the wish of the donor, Judge J. H. Carpenter has been elected to this professorship.

THE METHODS OF INSTRUCTION.

The methods of instruction are varied and embrace the advantages of several of the most approved systems.

Lectures by members of the faculty are given on leading topics, and students required to take notes. In connection with these the students are referred to leading cases, required to read them and make a concise statement of the facts in each case, the question of law involved, the decision and the reasoning of the court. This method is found very valuable.

Text-book study is required and this is followed by recitations in which the classes are thoroughly examined. In the law of real property this is followed by a searching review.

Unusual pains are taken to make students familiar with the preparation of all kinds of legal documents. In common law pleading they are required to practice in drafting pleadings in the entire series. In equity practice and pleading they are also required to conduct suits from beginning to end, thus becoming familiar with all the steps in the suit. In code practice and pleading a thorough course of instruction is given and practical exercises conducted in the drafting of pleadings, the preparation of papers of all kinds, especially affidavits, motion papers, orders, findings, exceptions, judgments, bills of exception. To illustrate the practice and familiarize students with the actual work of the lawyer, cases are submitted, and the student is required to prepare, under supervision and instruction, all the papers in various actions to familiarize them with practice and procedure.

In criminal law, the class is exercised in the drafting of complaints, indictments, informations, warrants, pleas, and in all the steps of a criminal prosecution. All papers are examined, errors pointed out, and students required to perfect them.

In lectures and examinations much pains are taken to impress upon the mind the leading general principles and the reason of the law.

Moot court practice forms a large element in the required work. Cases are assigned involving careful study. Students are required to issue process, prepare pleadings, contest each step in practice, make briefs and oral assignments. Others, sitting as judges, examine the questions and prepare written opinions. Practical instruction is also given in the practice in the courts of probate and in the procedure in Federal courts.

COURSE OF INSTRUCTION.

The course of instruction during the two years will be, subject to modification, as follows:

JUNIOR YEAR.

FALL TERM—Elementary Law; Contracts; Agency; Domestic Relations; Real Property; Personal Property; Common Law Pleading and Practice.

WINTER TERM—Real Property; Contracts; Partnership; Equity Pleading and Practice; Criminal Law; Private Corporations.

SPRING TERM—Contracts, Bailments; Real Property; Criminal Law and Practice; Public Corporations; Practice and Pleading under Code.

SENIOR YEAR.

FALL TERM—Contracts; Bills of Exchange and Promissory Notes; Evidence; Wills; Real Property; Uses and Trusts; Common Carriers; Taxation; Practice and Pleading under Code.

WINTER TERM—Constitutional Law; Real Property; Eminent Domain; Bills of Exchange and Promissory Notes; Evidence; Equity Jurisprudence; Practice after Judgment; Special Proceedings; Special Actions; Railway Law; Damages; Estoppel.

SPRING TERM—Constitutional Law; Equity Jurisprudence, Torts and Remedies therefor; Evidence; Railway Law; Administration of Estates; Negligence; Practice in special actions and Proceedings.

ADVANTAGES.

The peculiar advantages which the city of Madison, the capital of the state, afford to the law student deserve mention.

COURTS—All sessions of the Supreme Court are held here, in the same building in which the Law College is located. During the most of the year the student has an opportunity of listening to arguments carefully prepared by able lawyers before that Court. Two terms of the United States Circuit and District courts are held here annually. Many interesting causes arise and are tried in these courts. The circuit court of Dane county holds three terms annually, affording the student excellent opportunity to learn by observations the methods of procedure in jury trials. The municipal court of Dane county sits daily. Nowhere are better facilities at hand for becoming familiar with the practice in courts, and the methods pursued by able and successful practitioners.

THE LEGISLATURE of the state holds one session during each course, affording the student opportunity to observe the processes of legislation.

THE UNIVERSITY.—The University of Wisconsin has one of the finest sites for a seat of learning in the world. Beautifully located in a healthful climate, admirably equipped and endowed, with a large attendance of students from the best youth of the country, the student of this college is surrounded by the best of influences and incentives.

LIBRARIES.— The Law College has a fine and rapidly increasing library. The law library of the State, the largest and most complete in the Northwest, is located in the Capitol building, in which the law lectures of the College are given, and is at all times accessible to students for study and reference, and conveniences are afforded them for study and the use of the books. The University libraries, and those of the State Historical Society and the Madison City Free Library are also open to the law students, together embracing more than 200,000 volumes, including pamphlets.

THE BAR.— The bar of Dane county is an unusually strong one. Students who desire it can generally obtain situations in law offices, where they have opportunities to assist in practice, in the preparation of briefs and in the conduct of legal business, at the same time attending lectures and the practical exercises of the classes.

TEXT-BOOKS.

Among the text-books used as the ground-work or basis of examination are:

Benjamin on Sales; Bishop on Contracts; Bishop on Non-Contract Law; Bishop on Criminal Law; Cook on Stock, etc.; Cooley on Torts; Dillon on Municipal Corporations; Edwards on Bills of Exchange and Promissory Notes; Greenleaf on Evidence; Langdell on Equity Pleading; Lewis on Eminent Domain; Mechem on Agency; Mills on Eminent Domain; Morawetz on Private Corporations; Parsons on Contracts; Pomeroy's Equity Jurisprudence; Pomeroy's Remedies and Remedial Rights; Redfield on Wills; Rorer on Railroads; Schouler on Domestic Relations; Schouler on Personal Property; Schouler on Wills; Stephens on Pleading; Story on Agency; Story on Partnership; Tiedeman on Real Property; Tiedeman on Sales; Wade on Law of Notice; Washburn's Outlines of Criminal Law; Washburn on Real Property; Willard's Equity Jurisprudence.

The books mentioned in the following list may also be used to advantage:

CONTITUTIONAL HISTORY.— Hallam's Constitutional History of England (1485–1760); May's Constitutional History of England (1760–1870); Young's Constitutional History of England (1760–1860); Bagehot's English Constitution; Fischel's English Constitution; Cox's English Institutions; Curtis' History of the Constitution of the United States; Bancroft's History of the Constitution of the United States; Von Holst's Constitutional History of theUnited States.

CONSTITUTIONAL AND STATUTE LAW.— Cooley's Principles of Constitutional Law; Cooley's Constitutional Limitations; Endlich on Interpretation; Story's Commentaries on the Constitution of the United States;

Sedgwick on Constitutional and Statutory Law; Jameson's Constitutional Counselor; Bishop's Written Law; Maxwell on the Interpretation of Statutes.

JURISPRUDENCE.—Holland's Elements of Jurisprudence; Austin's Lectures on Jurisprudence; Lorimer's Principles of Jurisprudence; Ames on the Science of Law.

INTERNATIONAL LAW.—Wheaton's Elements of International Law; Phillimore's International Law; Woolsey's Introduction to International Law; Hall's International Law; Story's Conflict of Laws; Wharton's Conflict of Laws.

CONTRACTS.—Anson, Benjamin, Bishop, Metcalf, Parsons, Pollock.

BAILMENTS.—Edwards, Schouler, Story.

SALES.—Benjamin, Tiedeman.

CORPORATIONS.—Angell and Ames, Field, Morawetz, Taylor, Dillon on Municipal Corporations; Thompson on Liability of Stockholders.

BILLS, NOTES AND COMMERCIAL PAPER.—Byles, Chalmers, Daniel, Parsons, Randolph, Story.

DOMESTIC RELATIONS.—Reeves, Bishop on Marriage and Divorce; Bishop on Married Women; Cord on Married Women; MacDonnell on Master and Servant; Ewell on Infancy; Tyler on Infancy; Schouler's Domestic Relations.

EVIDENCE.—Best's Principles of Evidence; Stephens' Digest of the Law of Evidence; Wharton, Starkie, Rogers on Expert Testimony.

INSURANCE.—May on Insurance; Wood on Fire Insurance; Bliss on Life Insurance, Arnold on Marine Insurance.

REAL PROPERTY.—Boone, Williams, Tiedeman.

PARTNERSHIP.—Lindlay, Parsons, Story, Tyler, Pollock.

WILLS AND ADMINISTRATIONS.—Redfield on Wills; Jarman on Wills; Williams on Executors; Woerner's American Law of Administration.

COMMON CARRIERS.—Hutchinson, Redfield on Railways; Thomson on Passenger Carriers.

EQUITY.—Pomeroy or Story's Equity Jurisprudence; Adams' Equity; Bispham's Principles of Equity.

CRIMINAL LAW.—Bishop, Wharton, Harris, May, Stephens' Digest of Criminal Law.

PLEADING.—Gould, Chitty, Bliss on Code Pleading; Story's Equity Pleading; Barton's Suit in Equity.

MINERAL LAWS.—Weeks.

SHIPPING AND ADMIRALTY.—Abbott, Conkling, Desty, Parsons.

EASEMENTS.—Goddard, Washburn.

TAXATION.—Blackwell, Burroughs, Cooley, Desty.

TORTS.—Addison, Ames, Bigelow, Hillard, Moak, Weeks and Bishop on Non-Contract Law.

Students, who are able to do so, will find it to their advantage to furnish their own books. They will need them in practice. Arrangements have been made by which they can be ordered through the Secretary of the Board of Regents, and obtained at a considerable discount from quoted prices. It is believed that the books required for the first year can be obtained for about sixty dollars; for the second year, for about seventy-five dollars.

TERMS OF ADMISSION.

Legal practice touches upon a great variety of relations and involves a knowledge of a wide range of subjects. A good fundamental education is important to success; especially is it necessary that the beginner in the study of law should possess a mastery of the English language, so as to speak and write it correctly. He should be familiar with English literature and with general history; also with the general features of civil government and especially with the Constitutions of the United States and of Wisconsin.

Candidates for admission will therefore be examined in English language (orthography, grammar, composition, etc.), in English literature (leading works and authors), in American and general history, and in the constitution of the United States. The candidate should also possess a fair knowledge of other common English branches. If deficient in these, or if he desires to do so, he will be permitted during the first year to pursue essential studies in the University course, without charge.

Candidates will be admitted without examination upon presenting certificates of graduation from any reputable college or university, State normal school, accredited high school or academy, or upon presenting a first or second grade teacher's certificate. Evidence of good moral character is required.

ADMISSION TO ADVANCED STANDING.

The regular course is for two years of thirty-eight weeks each. Candidates presenting duly accredited certificates from other law schools of good standing will be admitted to corresponding standing in this college without passing examinations. Candidates who have studied elsewhere, and can pass examination upon the studies of the Junior year, or their equivalent, can enter the Senior year.

Students entering the Junior class, after the beginning of the academic year, will be required to read and pass examination in the work of the class, which has been done prior to their admission.

EXAMINATION FOR ADMISSION.

The examination for admission will be made on the opening day of the fall term. Candidates intending to apply for admission are requested to notify the Dean before the commencement of the term. No student of the Junior year will be admitted to the Senior Class who fails to pass an examination in more than two studies of the Junior year, except conditionally; his graduation being dependent upon his attaining proficiency during the year, in the studies wherein he was found deficient.

For graduation each student will be required to have passed a satisfactory examination upon all studies pursued during both years of the course, such examinations to be made either at the end of each year, or on completion of a particular topic; and he must have prosecuted or defended to judgment such moot court cases as shall have been assigned by the Faculty, and must have prepared and presented to the faculty, at least two weeks before the close of the Senior collegiate year, a satisfactory thesis upon some assigned legal topic.

EXPENSES.

The matriculation fee for the full course is $100, two-thirds of which must be paid at the opening of the first year, and one-third at the opening of the second year. For students entering the advanced class the fee is $75.

All fees are payable in advance at the office of the Secretary of the Board of Regents, No. 24 East Mifflin Street. Not less than $100 will be charged for a two years' course, nor less than $75 for one year's course.

No deductions will be made for absences, nor extension of time of payment for fees granted.

The expenses of living are moderate. Good board can be obtained at from $3 to $4 per week, and by forming or joining clubs the expense can be reduced.

SOCIETIES.

The E. G. Ryan Literary Society and the Forum are two incorporated literary societies, composed entirely of law students. Each of them is in flourishing condition, and each holds weekly meetings in one of the rooms of the college, for debates and other literary exercises.

MOOT COURTS.

A Faculty Moot Court sits once in each week for the trial of cases, for each class. Each student must prosecute or defend at least two actions in this court, during the course. There are also several Class Moot Courts, so that students may have more frequent practice in preparing and arguing questions of law and causes submitted.

SCHOOL OF PHARMACY.

FACULTY.

THE PRESIDENT OF THE UNIVERSITY.
FREDERICK B. POWER, Professor of Pharmacy and Materia Medica.
WILLIAM W. DANIELLS, Professor of Chemistry.
CHARLES R. BARNES, Professor of Botany.
HOMER W. HILLYER, Assistant Professor of Organic Chemistry.
EDWARD KREMERS, Instructor in Pharmacy and Director of the Pharmaceutical Laboratory.

COURSES OF STUDY.

PHARMACY.

PROFESSOR POWER AND DR. KREMERS.

The constant and rapid advancement in the various departments of professional and scientific knowledge, and especially in those branches of applied science most directly connected with the practice of pharmacy, has led to the requirement of higher educational qualifications on the part of those engaged in the responsible duties of the preparation and dispensing of medicines.

The importance of such qualifications in their relation to the progress of medical science and the conservation of the public health has now become quite generally recognized, and in this state has found expression in the following legislative enactment, Chapter CLXVII, Laws of 1882, amended in 1885 and 1887, entitled: *An act to regulate the practice of Pharmacy, the licensing of persons to carry on such practice, and the sale of poisons in the State of Wisconsin.*

Similar laws, the observance and enforcement of which are controlled by officially appointed Boards of Pharmacy, have now been adopted and are in successful operation in most of the States of the Union. They

are designed to restrict the practice of pharmacy to those who are considered to possess the proper degree of competency and skill, as attested by the possession of diplomas from accredited Schools of Pharmacy, or through the evidence afforded by suitable examinations, preceded by a definite period of apprenticeship or professional service.

In order to adequately meet these legal requirements the Department of Pharmacy was established by the Regents of the University of Wisconsin in 1883, and the succeeding years have been attended by a broad and satisfactory recognition of its service to the state. With its present equipment it affords unexcelled opportunities for acquiring a thorough practical education and training in all the branches of applied science which are most intimately connected with the successful pursuit of professional pharmacy.

The instruction is extended through a period of two years. The *required* courses include the fall and winter terms, or about seven months, of each academic year. *Optional* courses in special work are also offered during the fall, winter and spring terms, and students are strongly recommended to extend their studies through the spring term when practicable.

The course of instruction comprises a series of lectures upon Practical Pharmacy and Pharmaceutical Chemistry; General Chemistry, inorganic and organic; Chemical Physics; Organic Materia Medica or Pharmacognosy; and Structural, Systematic and Physiological Botany — all of which are amply illustrated by cabinet specimens, experiments, apparatus and diagrams, with frequent reviews throughout the course.

On account of the importance and value of thorough practical as well as theoretical knowledge in the several departments of study, the attainment of a certain degree of proficiency and skill in practical chemical analysis and in pharmaceutical and chemical manipulations is required of all those upon whom the degree of the University is conferred. All students are therefore required to apply themselves daily, throughout both courses, to practical work in the chemical and pharmaceutical laboratories. These are large, conveniently arranged and thoroughly equipped, and afford excellent opportunities for acquiring a high degree of proficiency in the lines of work indicated. In connection with the prescribed courses of study, several optional courses are offered to those students who are sufficiently advanced in their required work to be able to profitably avail themselves of them. These embrace the laboratory studies of vegetable histology, blow-pipe analysis, and other special divisions of botanical, chemical or pharmaceutical work. Opportunities are also available for pursuing special studies in other departments of the University, when the attested qualifications and scholarship of the applicant are such as to warrant the granting of these privileges.

The following is a more specific statement of the subcourses in Pharmacy. Those in Chemistry and Botany will be found under their appropriate heads, pages 132, 139:

Subcourse I, Practical Pharmacy and Pharmaceutical Chemistry. This course is based principally upon the United States Pharmacopœia (sixth revision, 1880), and consists of three lectures each week, with a review every alternate week, throughout the session.

The introductory lectures of the course are devoted to the consideration of the scope and applications of pharmaceutical science, together with an historical review of the more important Pharmacopœias in present use, with special explanations of the more prominent characters of those of the United States, Great Britain, Germany, France, Scandinavia, and other countries of continental Europe. Such other works as are of particular value as literary aids in a systematic and complete course of study are also brought prominently to notice. This is followed by an explanation of the different systems of weights and measures in present use and the standards from which they are derived, the construction and use of the balance, and the subject of specific gravity, with its practical applications. Those operations of pharmacy involving the use of heat are next considered, such as the processes of solution, evaporation, simple, fractional and destructive distillation, sublimation, ignition and fusion, together with the demonstration of the methods employed for the determination of some of the physical constants, boiling points, melting points, etc. The various other processes and operations which are of special importance in pharmacy are also fully demonstrated and explained, such as the methods of filtration, precipitation, crystallization, dialysis, percolation and re-percolation. In connection with each of these subjects a practical illustration of a working process is given, with the use of different forms of apparatus, thus clearly demonstrating their application in the production of the various chemical and pharmaceutical preparations. With these manipulative processes such simple classes of officinal preparations are carefully reviewed as may be profitably studied in connection with them, as, for example, the solutions, medicated waters, infusions, decoctions, solid and fluid extracts, tinctures, powders, etc.

The subsequent lectures are devoted to such subjects as properly fall within the domain of pharmaceutical chemistry in its broadest sense, and therefore include the methods of preparation, chemical and physical characters, tests of purity, and medicinal uses of all the officinal inorganic and organic compounds, or such as are otherwise of importance in pharmacy and medicine. Commencing with the non-metallic elements, chlorine, bromine, iodine, sulphur and phosphorus, the salts of the metals, classified according to their natural or chemical relations, are next con-

sidered. These are represented by the numerous compounds of potassium, sodium, ammonium, lithium, calcium, magnesium, zinc, aluminium, iron, manganese, lead, mercury, silver, copper, bismuth, arsenic, antimony, etc., which are followed by the inorganic acids, and subsequently by the important organic compounds, such as the hydrocarbons, alcohols, simple and compound ethers, organic acids, alkaloids, glucosides, carbohydrates and other neutral principles. In connection with the various compounds included in these groups, all the important preparations into which they enter, or which are derived from them, are fully discussed. A few lectures are finally devoted to such newly introduced medicinal chemicals or compounds as do not admit of more exact classification, and also to special divisions of extemporaneous pharmacy. (Prof. Power.)

Text-book: U. S. Pharmacopœia.

Required of first year students in Pharmacy.

Subcourse II, Organic Materia Medica or Pharmacognosy. This course consists of three lectures each week, with a review every alternate week throughout the session.

The first lectures of the course are devoted to those drugs or products derived from the lower orders of plants or cryptogams, after which the large and important class of vegetable drugs obtained from the phanerogams are considered in detail, and in accordance with the botanical arrangement of their natural orders. A few lectures are finally devoted to such drugs of animal origin as still possess sufficient value to merit attention.

Each drug is considered with regard to its botanical origin, commercial sources, and the historical facts of practical interest connected with it; this is followed by its description, and a complete exposition of its anatomical characters and chemical constituents. The great variety of organic compounds represented by the proximate principles of vegetable drugs affords opportunities for a constant review of the field of organic chemistry, and for the elucidation of the synthetic methods at present employed in the production of many of the most important and interesting medicinal agents.

The subject of pharmaco-dynamics also receives its proper share of attention, including the antidotes for such vegetable substances as possess poisonous properties, without, however, entering to any considerable extent into the subject of therapeutics.

It is the special aim to enable the student promptly to recognize all the officinal and important drugs and to exercise proper discrimination as to their authenticity, quality, and freedom from adulteration. With this purpose in view, all the salient points of distinction between such

as possess similarities in their physical or histological characters are duly demonstrated and explained.

The lectures are fully illustrated by a very complete collection of cabinet specimens of the drugs and their products, botanical plates, etc. (Prof. Power.)

Text-books: Flueckiger and Hanbury's Pharmacographia; Maisch's Organic Materia Medica; Flueckiger and Tschirch's Principles of Pharmacognosy (American edition by Power.)

Required of second year students in Pharmacy.

Subcourse III, Pharmaceutical Laboratory Work. The instruction of the pharmaceutical laboratory is designed to be such as will be of the greatest practical value to the pharmacist.

In this course, therefore, the analytical work of the chemical laboratory is first supplemented in the fall term by volumetric analysis, toxicology and the assaying of important drugs.

In volumetric analysis the processes and exercises are selected with special reference to the requirements of the U. S. Pharmacopœia, and includes also the volumetric estimation of sugars. In toxicology the general characters and reactions of the officinal and other important alkaloids and proximate principles are practically studied, as also methods for the separation of organic and inorganic poisons from complex organic mixtures. Some time will then be given to the valuation or assay of important drugs, such as opium, cinchona, nux-vomica, etc., and to other processes of the Pharmacopœia involving analytical methods, such as the quantitative estimation of alcohol in wines and other liquids.

These lessons are accompanied by lectures whenever practicable, as, for example, in connection with the study of the alkaloids, ptomaines and toxicological methods. In general, however, the instruction will be as individual as possible.

As an introduction to thesis work a number of chemical compounds, both inorganic and organic, and various pharmaceutical preparations, are required to be made by each student. These products are subsequently examined for their purity and strength by the application of both qualitative and quantitative tests. In addition to the practical knowledge thus acquired, a clear conception of the theories pertaining to each subject is demanded, and this is tested by occasional essays to be presented before the entire class for criticism.

The preceding analytical exercises are designed to develop accuracy and skill, and also to cultivate the independence of thought and careful observation which are such essential requisites for successfully conducting original investigation.

The winter term will be chiefly devoted to the work involved in the preparation of a thesis, which is required of all candidates for graduation. The time allotted for this purpose is to be regarded as the equivalent of two full studies.

The selection of a subject for a thesis is largely a matter of choice with the student, who, however, will be further guided in this particular by the advice and suggestions of the instructor. During the term students are called upon to report the progress of their investigations to the class for discussion. At the close of the term the results are to be elaborated, neatly recorded on thesis paper, and presented to the Director of the Department.

Text-books for the required course: U. S. Pharmacopœia, Hoffmann and Power's Examination of Medicinal Chemicals. The library of the Department, which includes a good selection of standard works on Pharmaceutical Chemistry, Pharmacognosy, and allied sciences, is also easily accessible to students working in the laboratory. (Dr. Kremers.)

The laboratory is open from 9 A. M. to 1 P. M., and from 2 to 5 P. M. *Required of second year students in Pharmacy.*

In the spring term special lines of work can be undertaken by both junior and senior students. Exceptional advantages are offered to those who remain during the spring term, and all who are able to avail themselves of this extension of the prescribed course of study are strongly recommended to do so.

Review of Pharmaceutical Chemistry.—During the winter term a review of pharmaceutical chemistry will be given the senior class. The subjects may be taken from inorganic or organic chemistry. Facts of pharmaceutical interest will be chiefly dwelt upon. These, however, will be viewed in the light of general and theoretical chemistry, and of chemical and pharmaceutical history. The end to be attained is to lead the student to think and reason for himself, in order to better prepare him for the original investigations connected with his thesis work. Three lectures weekly. (Dr. Kremers.)

PHARMACEUTICAL BOTANY.

PROFESSOR BARNES.

For the course in Pharmaceutical Botany, as well as for the general courses of Botany, see page 139, under College of Letters and Science.

GENERAL AND ORGANIC CHEMISTRY.

PROFESSORS DANIELLS AND HILLYER.

For courses in General and Organic Chemistry see page 132, under College of Letters and Science.

GENERAL INFORMATION RESPECTING THE PHARMACY DEPARTMENT.

It is desirable that all students entering this department should previously have had at least two years' practical experience in a well conducted pharmacy, as the information thus acquired, however imperfect and unclassified, will, in most cases, enable the student to more readily comprehend the subject-matter of the lectures, and to derive relatively greater benefit from them. Although those who are otherwise qualified are admitted to the class without such preliminary knowledge of the practical operations of pharmacy, this must invariably have been acquired prior to graduation, as one of the conditions thereof.

TERMS OF ADMISSION.

All applicants for admission must be at least eighteen years of age.

Applicants who bring a diploma of graduation from any standard high school, or a certificate of good standing and scholarship in a corresponding higher educational institution, will be admitted without examination.

All other applicants who do not present written evidence of a satisfactory preliminary education, will be subjected to such an examination in arithmetic, grammar, English composition, geography (political and physical), and the history of the United States, as will afford a guaranty that the applicant is capable of pursuing with advantage and profit to himself the studies of this department. The examination of such applicants will be held on the two days immediately preceding the opening of the fall term, September 7th and 8th.

Students from other recognized colleges or schools of pharmacy will be admitted to the Senior course of this department only when, by a special examination, they are found to be proficient in the studies of our Junior year, including the required amount of laboratory work.

REQUIREMENTS FOR THE DEGREE OF GRADUATE IN PHARMACY (PH. G.)

Every person upon whom the diploma of this department of the University shall be conferred, must conform to the following requirements:

He must have attained the age of twenty-one years, and have attended two full courses of instruction (two years) in this department of the University; or one course (one year) in this, and one in another recognized college or school of pharmacy, in which the same studies are required. The last year, however, must be passed in this University. His deportment, character and work must have been satisfactory. He shall also furnish evidence of having had a practical experience of four years

in a dispensing pharmacy, under the guidance of a competent and rep utable preceptor (the time actually spent in attendance upon the lec tures and in the instruction of the laboratories, fourteen months, being considered a part of such time of service), and shall submit an original essay or thesis upon some subject of practical pharmacy, chemistry, materia medica, botany or other branch of science intimately connected therewith.

The candidate must furthermore have passed a satisfactory examination, by the Faculty, in the several branches of science taught, including laboratory work, and an examination in practical pharmacy by a committee composed of members of the State Pharmaceutical Association.

On the satisfactory fulfillment of the above requirements, the candidate will be entitled to the degree of Graduate in Pharmacy, and will receive the diploma of the University.

REQUIREMENTS FOR THE DEGREE OF MASTER OF PHARMACY (Ph. M.)

Any *Graduate in Pharmacy* of this school, in good professional standing, may become a candidate for the higher degree of *Master of Pharmacy.* For the attainment of this degree, the candidate shall spend one entire year (three terms) at the University after graduation, and during this period shall have satisfactorily pursued advanced work in some science or sciences specially allied to pharmacy. This shall include the presentation of a dissertation embodying the results of an original investigation, which shall be satisfactory to the Professors of the Department, and upon their joint recommendation he shall be entitled to the degree of *Master of Pharmacy.*

PHARMACEUTICAL SOCIETY.

A pharmaceutical society, composed of students of this department, affords a valuable opportunity for the discussion of various professional subjects and the presentation of independent works.

TEXT-BOOKS AND BOOKS OF REFERENCE.

PHARMACY. Remington's Practice of Pharmacy, or Parrish's Treatise on Pharmacy; United States Pharmacopœia (sixth revision).

CHEMISTRY. Remsen's Inorganic Chemistry; Fresenius' Qualitative Analysis; Hoffmann and Power's Examination of Medicinal Chemicals; Remsen's Organic Chemistry.

MATERIA MEDICA. Maisch's Organic Materia Medica; Flueckiger and Hanbury's Pharmacographia; Flueckiger and Tschirch's Principles of Pharmacognosy (Power); National Dispensatory by Stillé and Maisch.

BOTANY. Gray's Lessons and Manual of Botany.

FEES AND EXPENSES.

A matriculation fee of $5 is required to be paid for the first course in this department; the ticket issued therefor should be obtained by September 15th, and none will be issued after October 1st. This ticket is to be renewed for every subsequent course (without additional expense), in order that a correct registry of attendance may be kept.

The lectures are free to all matriculated students who are residents of the State of Wisconsin; for non-resident students a lecture fee of $25 is required for each course, which must be paid by October 1st. The fee for incidental expenses is $10 for each course, which must be paid by all students. In the instruction of the chemical laboratory, each student is required to pay for the chemicals which he consumes, and for the use or breakage of apparatus. The expense will be in proportion to the care and economy exercised in his work. A payment of $15 in advance is therefore required, of which, as all subsequent deposits, an accurate account is kept; and the amount of the deposit not used is returned to the student at the completion of the course.

In the instruction of the pharmaceutical laboratory, a deposit of $15 is required to cover the cost of material consumed and the use or breakage of apparatus. An accurate account of such items is kept, and such sums as may remain to the credit of a student at the completion of his course will be refunded. Materials which may be required for original investigations or for work upon graduating essays must be furnished by the student at his own expense.

No diploma fee is required upon graduation.

Further details relating to this department are contained in the annual announcement, published in May, which may be obtained by addressing Prof. F. B. Power, Madison, Wis.

WISCONSIN SUMMER SCHOOL FOR TEACHERS.

During the past four summers a school for teachers has been maintained at the University. By a special act of the legislature it has been given a permanent official organization, and an annual appropriation made for its support. Its teachers are designated by the State Superintendent of Public Instruction and the President of the University, jointly. The following are its officers: Professor J. W. Stearns, LL. D., Principal; Professor E. A. Birge, Ph. D., Secretary.

One hundred and thirty-one students were in attendence in 1890, a list of whom is given on page 44.

The course of study for the past summer embraced twenty-one courses on the following subjects: psychology, pedagogy, zoology, physiology, botany, chemistry, physics, scientific geography, and English literature.

The Faculty included the following:

Professor J. W. Stearns, Psychology and Pedagogy.

Professor E. A. Birge, Physiology and Zoology.

Professor W. W. Daniells, Chemistry.

Professor C. R. Barnes, Botany.

Professor S. Y. Gillan (Milwaukee Normal School), Geography.

Professor A. L. Kimball (Johns Hopkins University), Physics.

Professor J. C. Freeman, English Literature.

ANNOUNCEMENT FOR THE FIFTH ANNUAL SESSION, JULY 6–31, 1891.

FACULTY.

J. W. Stearns, Professor of Philosophy and Pedagogy, University of Wisconsin—Psychology and Pedagogy.

C. E. Bennett, Professor of Latin, University of Wisconsin—Latin.

E. A. Birge, Professor of Zoology, University of Wisconsin—Physiology and Zoology.

Nathaniel Butler, Jr., Professor of English Literature, State University of Illinois, Champaign—English Literature.

Stanley Coulter, Professor of Botany, Purdue University, La Fayette Indiana—Botany.

W. W. Daniells, Professor of Chemistry, University of Wisconsin — Chemistry.

S. J. Saunders, Assistant in Physics, Cornell University, Ithaca, N. Y.— Physics.

F. J. Turner, Professor of American History, University of Wisconsin — History.

The courses of instruction will include one course in psychology, one in pedagogy, two in zoology, two in botany, four in chemistry, two in physics, and one in physiology, substantially as in 1890. A course in American or in English history will be given by Prof. Turner. Prof. Bennett will lecture on the private antiquities of the Romans and the architectural remains of Rome, and will conduct a teachers' course in Latin. Prof. Butler will give a general survey of English literature, a general survey of American literature, and a course in Shakespeare. Prof. Birge will give a course in microscopic pond life.

A matriculation fee of $5 will be charged to residents of the State; those from other states will pay a fee of $10. For further information address Prof. J. W. Stearns, Madison, Wis.

CALENDAR.

ACADEMIC YEAR, 1890–1891.

FALL TERM began Wednesday, September 10, closed Friday, December 19 — 14½ weeks.

WINTER TERM began Monday, January 5, closed Friday, March 28 — 12 weeks.

SPRING TERM begins Monday, April 6, closes Wednesday, June 17 — 10½ weeks.

Examination of candidates for admission, June 11 and 12.

Baccalaureate address, Sunday, June 14.

COMMENCEMENT, Wednesday, June 17, 9 A. M.

ACADEMIC YEAR, 1891–1892.

EXAMINATION of candidates for admission, September 7 and 8.

FALL TERM begins Wednesday, September 9, closes Friday, December 18 — 14½ weeks.

WINTER TERM begins Monday, January 4, closes Friday, March 25 — 12 weeks.

SPRING TERM begins Monday, April 4, closes Wednesday, June 15 — 10½ weeks.