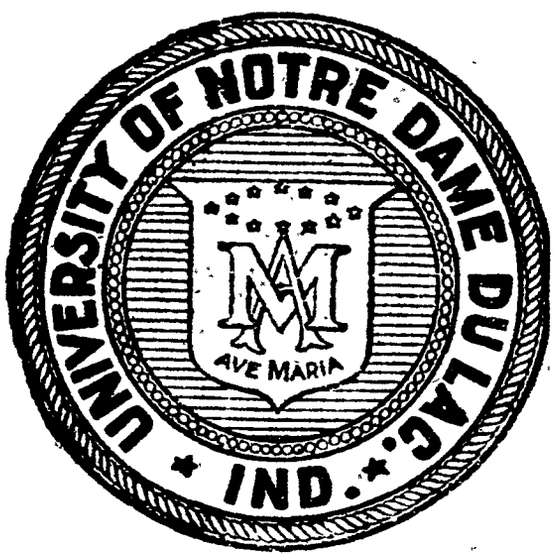
SERIES II.
NUMBER 1

Published Quarterly by
The University

BULLETIN

OF THE

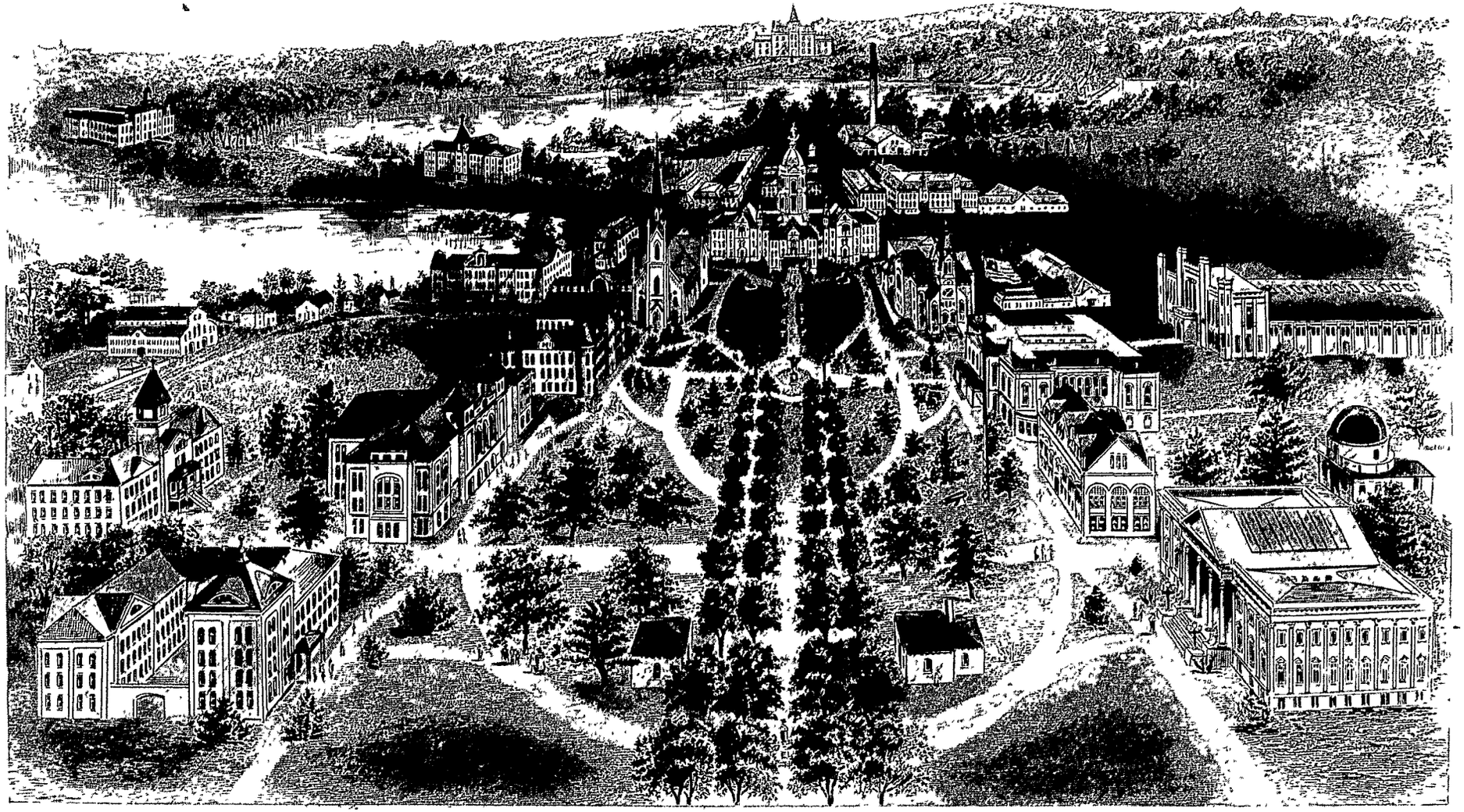
UNIVERSITY OF NOTRE DAME



GENERAL CATALOGUE

1905-1906

Entered as Second-Class Matter in the Postoffice at Notre Dame, Indiana, July 17, 1905



UNIVERSITY OF NOTRE DAME

Notre Dame, Indiana

Series II. Number I.

BULLETIN

OF THE

University of Notre Dame

NOTRE DAME, INDIANA

GENERAL CATALOGUE.

1905-1906

PUBLISHED QUARTERLY AT NOTRE DAME

UNIVERSITY PRESS

JULY, 1906

Entered at the Postoffice, Notre Dame, Indiana, as second class matter, July 17, 1905.

DIRECTORY OF THE UNIVERSITY.

The **FACULTY**—Address:

THE UNIVERSITY OF NOTRE DAME,

NOTRE DAME, INDIANA.

The **STUDENTS**—Address:

As for the Faculty, except that the name of the HALL in which the student lives should be added.

There are at the University a Postoffice, a Telegraph Office, a Long Distance Telephone, and an Express Office.

The University is two miles from the city of South Bend, Indiana, and about eighty miles east of Chicago. The Lake Shore and Michigan Southern, the Grand Trunk, the Vandalia, the Indiana, Illinois & Iowa, and the Michigan Central railways run directly into South Bend.

CALENDAR FOR 1906-1907.

1906		
SEPTEMBER	11, 12-13.	Entrance Examinations.
	14.	Colleges open.
	23.	Reading of University Regulations in all the Halls.
OCTOBER	1.	Examinations of Conditioned Students.
	13.	Founder's Day. *No classes.*
	26-27.	Bi-Monthly Examinations.
	29.	Annual Retreat begins in the evening.
NOVEMBER	1.	Feast of All Saints. *No classes.*
	29.	Thanksgiving Day. *No classes.*
DECEMBER	4.	President's Day. *No classes.*
	5.	The William P. Breen Medal Orations.
	8.	Feast of the Immaculate Conception. *No classes.*
	18-19.	Bi-Monthly Examinations.
1907	20.	Christmas Vacation begins.
JANUARY	4.	Colleges open.
FEBRUARY	1.	State Oratorical Contest.
	22.	Washington's Birthday. *No classes.*
	23-25.	Bi-Monthly Examinations.
MARCH	17.	St. Patrick's Day.
	19.	St. Joseph's Day. *No classes.*
	31.	Easter. *No Easter Vacation.*
APRIL	1.	Easter Monday. *No classes.*
	26-27.	Bi-Monthly Examinations.
MAY	20.	Latest Date for handing in Prize Essays and Graduation Theses in all the Colleges.
	30.	Decoration Day. *No. classes.*
JUNE	1.	The Joseph A. Lyons Medal Recitations. The Patrick T. Barry Medal Recitations.
	3-8	Examination of Candidates for Graduation.
	9.	Baccalaureate Sermon.
	10-12.	General Examinations.
	12.	Commencement. Bachelors Orations. Commencement Address, 7:30 P. M.
	13.	Graduation Exercises, 8:00 A. M.

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* Died March 14, 1906.

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UNIVERSITY OF NOTRE DAME.

The University of Notre Dame was founded in the year 1842, by the Very Reverend Edward Sorin, the late Superior General of the Congregation of Holy Cross. In an act approved January 15, 1844, the Legislature of Indiana gave the University power to grant degrees. The beginning of this act is:

"*Be it enacted by the General Assembly of the State of Indiana*, that Edward Frederick Sorin, Francis Lewis Cointet, Theophilus Jerome Marivault, Francis Gouesse, and their associates and successors in office, be, and are hereby constituted and declared to be, a body corporate and politic, by the name and style of the 'University of Notre Dame du Lac,' and by that name shall have perpetual succession, with full power and authority to confer and grant or cause to be conferred and granted, such degrees and diplomas in the liberal arts and sciences, and in law and medicine, as are usually conferred and granted in other universities in the United States, provided, however, that no degree shall be conferred or diplomas granted, except to students who have acquired the same proficiency in the liberal arts and sciences, and in law and medicine, as is customary in other universities in the United States."

UNIVERSITY BUILDINGS.

THE MAIN BUILDING.

The dimensions of this building are 320 by 155 feet; it is five stories in height and is surmounted by a dome 207 feet in height. The executive offices, two study-halls, some dormitories and class rooms and the dining-rooms are in this building. The Library and the Bishops' Memorial Hall are also here temporarily. This building, like all others in the University, is lighted by electricity and gas, and heated by steam. The corridors of the first floor are decorated with mural paintings by Gregori.

THE CHURCH.

The Church of the Sacred Heart is 275 by 120 feet in ground dimensions and 125 feet in height from the floor to the roof-ridge. The interior is decorated by Gregori, and the architecture is Gothic. There is a large crypt and many chapels. In the tower are a chime of 32 bells and the great six-ton chief bell.

THE LIBRARY.

The Library contains 55,000 volumes. Students have access to it from 8:00 a. m. to 9:00 p. m.

WASHINGTON HALL.

This hall is 170 feet in length, 100 feet in width, and about 100 feet in height. It contains the rooms of the Department of Music, the reading rooms for Brownson and Carroll Halls, and the University Theater. The Theater is elaborately equipped with stage settings. It will seat 1,200 persons.

SCIENCE HALL

is situated a few steps south of Washington Hall. Its dimensions are 104 by 131 feet, and it is three stories in height. A large central space, the full height of the building, is occupied by a museum containing mineral, fossil, and biological specimens.

THE CIVIL ENGINEERING DEPARTMENT

occupies a portion of the basement of Science Hall as a laboratory. The lecture rooms are in the main building. The equipment of this department is sufficient for all the practice and exercises in the field necessary to illustrate and teach the practical methods of engineering. The instrumental outfit consists of one surveyor's transit, three engineer's transits with levels and vertical circles attached to telescopes, also solar attachment, two engineer's wye levels and a plane table with all the attachments, clinometers, chains, tapes, levelling rods, etc., and one Olsen's cement testing machine.

THE CHEMICAL DEPARTMENT

occupies the entire north side of the first floor of Science Hall. Adjoining the general museum, is a large and well-lighted room reserved for a library and chemical museum. Here are a library of chemical journals and books, and a steadily increasing collection of minerals, chemicals, and chemico-technical products of all kinds, designed to serve as illustrations of substances and processes, discussed in the various lecture courses. Adjoining this room are successively, an apparatus room, filled with the most modern apparatus for lecture and experimental work; a chemical storeroom, where laboratory supplies may be procured by the students; a lecture room, and a laboratory for qualitative and quantitative analysis. The laboratory is fur-

nished with hoods, of good draught; the desks are provided with water, gas, and the necessary reagents, and fully equipped with apparatus for work in gas analysis, organic analysis, and with apparatus for "Boiling Point and Freezing Point Determinations." The Balance Room, adjoining, contains assay and analytical balances sensitive to one ten-thousandth of a gramme. The lecture room is provided, among other things, with apparatus for stereopticon illustration, with electric batteries, and with a complete set of charts illustrative of the process employed in modern chemical industries.

The assay and furnace room, in the basement, is equipped with a set of gas furnaces of the most modern type, for the operations of roasting, fusing, scorifying and cupelling employed in the dry assay of ores.

The Department of

PHYSICS AND ELECTRICAL ENGINEERING

is located in the south wing. There is a large lecture room, with a seating capacity of sixty-five students, adjoining the rooms in which the apparatus is stored in dust-proof cases. Several smaller rooms in the basement contain heavy piers of masonry, for work with sensitive galvanometers.

The following is a partial list of the more important pieces of apparatus in the Physical Laboratories:

IN MECHANICS, ETC.:

Large physical balance,
Standard kilogram,
Standard metre,
Geneva cathetometer, capable of measuring to one twenty-five thousandth of an inch,
Dividing engine,
Atwood's machine,
Compound pendulum,
Break circuit recording chronograph,
Powerful hydraulic press with attachments,
Rotary air pumps and receivers,
A large clock with electrical contact pieces,

Self-winding clocks,
Several mercury barometers,
Two aneroid barometers.

IN ACOUSTICS:

A Mercadier radiophone,
Set of Koenig resonators,
Set of electrically-operated tuning forks by Koenig,
A Scott-Koenig Phonautograph,
Edison phonograph of earliest type,
Sets of vibrating rods, tubes and bells,
Large double siren,
A set of very small tuning forks producing the highest audible sounds,
A set of resonators mounted together with capsules for sensitive flames, arranged for the analysis of complex sounds,
Koenig's movable tuning forks, to draw compound curves on smoked glass,
Three sets of organ pipes,
Four sets of fine tuning forks,
Apparatus for manometric observation of sound phenomena,
A large tuning fork producing the lowest audible sound,
Apparatus for producing longitudinal vibrations in rods,
An electrical metronome,
Mounted tuning forks carrying small mirrors arranged to perform Lissajou's experiment, producing complex curves.

IN LIGHT:

Complete set of apparatus, made by Soleil, Paris, for the measurement of the wave length of light by various interference methods,
Sets of polarization apparatus,
Sets of lenses and spherical mirrors,
Two heliostats,
Four spectroscopes,
A polarizing saccharimeter,
Three projecting lanterns for gas or electric light, and 3,000 slides,
Set of large Nicol's prisms mounted,
Large compound prism to form widely dispersed spectrum,
Two Rowland gratings, 14,000 lines to the inch,
Set of photographs of solar spectrum by Rowland,
Several cameras with lenses and attachments,
A well equipped dark-room for photographic work,
Photometric room and equipment.

IN HEAT:

Melloni's apparatus for measuring radiation, absorption and reflection of heat, complete with a set of prepared substances,
Standard thermometers,
Air thermometers,
Steam engine indicator,
Calorimeters,
Apparatus for determing the coefficient of linear expansion, using the optical lever method.

IN ELECTRICITY AND MAGNETISM:

An absolute electrometer,
Holtz machine and apparatus for illustrating static phenomena,
Four induction coils,
Six bridges of different types,
Ammeters and voltmeters,
One 2,000 lb. electro magnet,
Standard resistance coils,
Several sets of storage cells,
Historical set of motors showing evolution of the modern machine from the early forms of the reciprocating type,
Ten galvanometers of various types,
Complete X-ray outfit,
Sets of apparatus for wireless telegraphy.

In addition to the electrical apparatus in the Department of Physics, the equipment for practical work in Electrical Engineering consists of engines, dynamos, instruments, etc., of commercial size, as follows:

A three phase A. C. induction motor, arranged to operate on single phase circuits, with a condenser compensator,
A high frequency 1000 V., 33 K. W., composite wound, Wood alternator of the latest type with excitater and a full set of switchboard instruments,
Several transformers of different capacity,
A high tension transformer for testing insolation,
An Edison bipolar 15 K. W. 125 V., generator,
A Thompson-Houston arc light machine with regulator and fifteen lamps,
A Wood arc machine, capacity 25 lights,
An Edison bipolar 3 K. W. 125 V., dynamo, with special winding,
A Van Depoele compound wound dynamo,
A special A. C. and D. C. 5 H. P. dynamo or rotary converter,
A series wound dynamo with wrought iron field,
A number of small motors.

A forty horse power high speed automatic engine,

A set of inclined coil alternating current portable instruments; voltmeter, ammeter and wattmeter,

A set of tools for metal working,

Telegraphing relays, sounders, switchboards, etc.,

Telephone apparatus, including subscribers sets of various modern types, a fifty drop manual switchboard complete and a lot of separate drops, jacks, switches, lightning arresters, etc.,

Automatic telephone switchboard containing first and second selector and connector switches, interrupter heat coils, etc., and three subscribers sets. With this apparatus all the operations involved in the operation of a 10000 system may be performed,

A complete central energy switchboad, several lines and subscribers sets and a selective signaling four party line outfit,

A collection of historical sets, including Reis' transmitter and receiver,

Standard portable bridge,

Common portable bridge,

Testing battery,

A power or foot lathe with wood turning tools, drills and hand tools for metals,

A calibrating lamp rack,

D'Arsonval and common galvanometers,

Ballistic galvanometer, standard condenser, etc., for capacity work,

Resistance boxes, standard megohms, etc.,

High resistance Thompson galvanometer,

Standard cells,

Voltameter arranged for the comparison of incandescent lamps,

A plug switchboard controlling all circuits,

A small engine belted to shafting to drive a plating dynamo and a buffer for cleaning and polishing work to be plated; solution, tank, etc.,—in all, a complete outfit for electrotype work,

A hot wire ammeter,

Twelve ammeters and voltmeters, mostly of the Weston type for direct current measurements,

A set of wood working tools,

Kohlrausch bridge for measuring battery resistance, etc.,

A lot of arc lamps, series and constant potential, open and enclosed arcs of various types,

A dynamometer type wattmeter,

Recording wattmeters of various types,

A collection of motor starting rheostats,

A set of parts of incandescent lamps showing the various stages in their manufacture,

A large collection of porcelain insulators, etc., used in electrical work, including a lot of insulators for high tension transmission lines,

A lot of armature core disks, transformer core stampings, formed coils, brush holders, pole pieces, samples of insulation, commutator segments, etc., used in dynamos of good design, donated by leading manufacturers of electrical machinery,

A case of marked samples of wire insulators, lamps, and other construction materials,

Library of practical technical books of reference and files of leading periodicals and trade publications,

A Cooper Hewitt mercury vapor lamp,

A high frequency Tesla coil and condenser,

A working model of the induction motor showing the action of the rotating field,

A transmission dynamometer capacity ¼ to 10 horse power for determining the efficiency of small dynamos

Full size armature winding models mounted to rotate in bipolar and multipolar fields,

A storage battery, 25 cells with with universal switch to connect for various voltages.

EQUIPMENT IN THE DEPARTMENTS OF BIOLOGY, GEOLOGY, AND MINERALOGY.

The department of Biology, on the north side of the second floor of Science Hall, consists of three large class-rooms and laboratories properly ventilated and lighted. There are also private laboratories set apart for post-graduate students. All the class-rooms are furnished with charts and models necessary in teaching the different courses. The arrangement of windows is such that the rooms can be easily darkened so that a stereopticon and lantern slides on the subjects of Botany, Zoology, and Physiology may be used.

The laboratories are well equipped with compound and dissecting microscopes, and in each room there is a library of books pertaining to biological subjects. The botanical laboratory contains twenty-four compound microscopes and all the requisite accessories for work in

Vegetable Histology and Cryptogamic Botany. The general laboratory of Microscopy, Histology and Embryology is also supplied with compound microscopes and the equipments indispensable in the courses mentioned above.

The bacteriological laboratory is completely equipped with compound microscopes, incubators, sterilizers, and all the improved apparatus employed in thorough and careful work in Bacteriology. Apart from the others is a laboratory of Photo-Micrography which contains a perfect photo-micrographic instrument with a complete set of accessory apparatus for experimentation, photographing microscopic objects, making lantern-slides, etc. A large and fully equipped dark-room adjoins this laboratory.

The south side of the second floor consists of class-rooms and laboratories for the courses in Geology and Mineralogy. The laboratories adjoining the class-rooms are well equipped for work in blow-pipe analysis and assaying.

THE MUSEUM.

connected with the departments described above, is well arranged for convenience of study. The zoological collection on the second floor at present fills sixteen large cases and represents typical forms of all the orders and genera of vertebrate and invertebrate animals. A large collection of representative vertebrate skeletons has recently been added to this part of the Museum.

The botanical collection, also on this floor, consists of two complete Herbaria, one of the United States, the other of Canada. There is also a second collection of the woods and fruits of the United States, almost complete.

The collections in Geology and Mineralogy occupy the

first floor. These collections are arranged in a series of cases on each side of the building. In one series is a carefully classified collection of minerals and ores. The opposite series of cases contains a large geological collection; some of the specimens here are of the rarest fossil remains of animal and plant life.

ENGINEERING HALL.

This building is situated in the southern part of the grounds and is a large two-story brick building, well lighted and heated. The lower floor contains the mechanical laboratory, machine shop, blacksmith shop and foundry. The second floor is given up to the wood shop and also contains a well lighted drawing room where students in designing may consult complete working drawings of the best steam engines and pumps to be found on the market.

The wood shop is supplied with modern work-benches fully equipped with the smaller tools necessary for carpentry, lathes for turned work, two jig saws, a pony planer, a joiner, circular saw and band saw, the whole forming an adequate equipment for a thorough mastery of joinery, scroll work and pattern making.

The machine shop contains two horizontal slide valve steam engines which are used for experimental purposes. The power for operating the machine shop is derived from the electric plant of the University, two ten-horse power motors being used for this purpose, from which power is transmitted to the various machines by line shafting running the entire length of the building. The latest improved lathes have been provided, nine in number, varying from a five inch swing in the smallest to a large engine lathe with sixteen foot bed having a capacity for work twenty-eight inches in diameter. Two drill presses, a large planer, a shaping machine and a

Brown and Sharp milling machine complete the outfit, thus making the machine shop a model of its kind. During the past year there have been completed in the machine shop seven new screw cutting lathes of fourteen inch swing, one twenty-eight inch Sibley and Ware drill-press, one horizontal 8 by 12 slide valve steam engine and a wood milling machine which will be added to the equipment in the new building. It is the policy of this department to refrain as much as possible from exercise work and each student is usually taking part in the construction of some new machine or engaged on general repair work for the University which is regarded superior to a fixed routine of exercises.

The blacksmith shop has the usual complement for teaching forging, annealing, welding and tool making. In the foundry work the student is instructed in the proper disposition of gates and sprues, the mixing of sand, setting up and drawing simple and complicated patterns and core making. This is supplemented with lectures on the proper mixing and heating of cast iron for the various purposes for which it is used.

In addition to the facilities afforded by the shops, the engineering students have access to the steam and power plants of the University which have been recently remodeled and made to compare favorably with the best contemporary practice. The main steam plant contains two batteries of ten horizontal tubular boilers, aggregating 1200 horse power. In connection with the boilers is installed the necessary testing apparatus as follows:—a Worthington hot water meter for measuring the amount of feed water, a feed water thermometer for getting temperature of same, a high range thermometer for temperature of generated steam, a throttling calometer for ascertaining the quality of steam and an automatic recording pressure gauge giving a continuous record of

the boiler pressure. Provision is made for finding the temperature and pressure of the flue gases by means of a pyrometer and draught gauge and for obtaining samples of flue gas for analysis. These, with a Carpenter coal calorimeter for determining the heating value of fuel, comprise a full and complete equipment for giving the student an intimate knowledge of the practical part of boiler management and testing. A Webster feed water heater and purifier, two compound duplex pumps, two vacuum pumps working on the heating system, two large Worthington fire pumps 16 by 9 by 12 with a capacity of 1500 gals. per minute, with numerous separators, steam traps, automatic reducing valves, etc., complete the apparatus in the main steam plant. A McEwen high speed automatic engine, an Armington and Simms engine of similar type and several low speed horizontal engines with planimeters, indicators, reducing wheels, slide rules and other necessary instruments, are used in studying the operation of the steam engine, distribution and economy of steam, regulation, valve setting and heat wastes.

In the gas engine laboratory are installed one horizontal ten-horse power four cycle gas engine completely equipped for experimental runs, a five horse power two cycle vertical gas engine of the marine type, one Motsinger Auto-sparker with induction coil, one Apple Ignition dynamo with storage battery, a Hendricks Automatic Igniter together with carburettors, spark plugs, spark coils, indicators, and all necessary equipment for a complete study of the gas engine.

THE CHEMICAL LABORATORIES

occupy a large three story building directly south of Science Hall. The entire first floor is devoted to advanced work and space is given to two large laboratories and lecture rooms. The second floor is occupied

by the Department of Pharmacy, and contains a large well-equipped laboratory, a modern drug store, a lecture room and museum, a library for pharmaceutical publications, and a general stock room. The general Inorganic, Organic and Elementary Chemical laboratories are on the third floor. Each laboratory is provided with ample hood accomodations, and each desk is furnished with water, gas, and suction.

SORIN HALL.

This building is 144 feet in length, with two wings 112 feet in depth. It has a basement and three high stories, and contains 101 private rooms for advanced students. These rooms are furnished, and students of Senior, Junior, or Sophomore standing in any of the Colleges are not required to pay rent. On the first floor there is a chapel, a law lecture room, and a law library. The building is lighted with electricity and heated with steam. In the basement are recreation rooms and bath rooms.

CORBY HALL.

Corby Hall is a second residence building. It has three stories and a basement, and it is 240 feet in width. There are 125 private rooms for students, with recreation rooms and a chapel. The building is lighted with electricity and gas and heated with steam. For room-rent and care of the room a fee is charged.

THE OBSERVATORY.

This building is located near the Chemical Laboratories and is designed for an equatorial telescope and for a transit or meridian circle. The equatorial telescope now in the building is intended for students of Astronomy, and is in use whenever favorable weather permits.

THE INFIRMARY.

This building, 200 feet by 45 feet in ground measurement and three stories in height, contains rooms for the use of students during illness. The sick are nursed by Sisters of the Holy Cross, and the University physician visits them daily.

THE GYMNASIUM.

The gymnasium which was burnt down in November, 1900, was replaced by a building 230 by 200 feet in dimensions. The track-hall is now 100 by 180 feet on the ground: it is used for indoor meets, winter baseball practice, basketball and military drill. The gymnastic hall is 100 by 40 feet and is furnished with a full set of new apparatus; below that are the offices, dressing-rooms and showerbaths. Friends of the University and the alumni contributed more than $3,000 to the fund for rebuilding.

The Cartier Field is an enclosed field for athletic games. There is a permanent grand stand near the baseball diamond and the cinder track, and a portable stand near the football rectangle. The field contains ten acres of ground, and is a gift to the University from Mr. Warren A. Cartier, C. E., of the class of '87.

OTHER BUILDINGS.

There are numerous other large buildings connected with the University; of these the principal are: Saint Joseph's Hall, Holy Cross Hall, the Community House, the Presbytery, and Saint Edward's Hall.

THE SYSTEM OF INSTRUCTION.

The entire plan of studies is based on the modified elective system. The student is free to select his own curriculum conformably to his natural liking, the career in life he may have in view, or the determinate intellectual bent developed during his secondary school years; but though he is free to elect his own studies he has not, however, unlimited freedom in this respect. The principle of general election is modified. Lest the young Freshman in his inexperience choose unwisely, he is aided in making his choice of studies by being permitted to select from among a number of parallel programs leading to baccalaureate degrees. Sixteen programs are open for his choice in the Colleges, each embracing courses which, in the opinion of the Faculty, contribute best to cultural, scientific or professional knowledge. These programs are, in some cases, made elastic by the introduction of elective courses, especially in the Junior and Senior years.

The hours scheduled in the different programs are credit hours based on the average amount of time required for attendance at recitations and the time necessary for preparation for recitations. One hour of recitation is regarded as the equivalent of two hours of laboratory work. The minimum number of credit hours which a student must carry is sixteen, the maximum number which he may carry is twenty. Students who wish to take more work than is indicated by the maximum requirements must apply by formal petition to the Faculty for the requisite permission.

REGULATIONS GOVERNING ADMISSION TO THE COLLEGES.

Candidates who wish to enter any of the Colleges must present evidence, either by examination or by a properly attested certificate, of ability to enter on the courses of the Freshman year. The specific subjects required for entrance will be found in this catalogue before the schedules of courses in each College.

Examinations in all the subjects required for admission to the University are held at Notre Dame in September, at the beginning of the Fall term.

A candidate failing to pass satisfactory examinations in one or more of the subjects required for admission to any College Program may, at the discretion of the Faculty, be admitted to his class conditioned, to make up his deficiency by extra study *within one school year.* Only when the conditions are removed will the student be admitted to full standing in his class.

Graduates of High Schools that are *fully accredited* to the State Universities, will be admitted without examination to the Freshman Year of any Program to which their preparatory studies entitle them.

Certificates of work done in public or private High Schools will not be accepted instead of examinations, unless the applicant has passed the final examination after a full course in his school, and the Faculty of the University are satisfied with the standing of the school.

Candidates for admission to advanced standing who are required to take examinations must pass, *in addition* to the usual entrance examinations, an examination in the work already done by the classes they desire to enter. The additional subjects may be found in the programs of studies.

Applicants for advanced standing who present cer-

tificates from other colleges or universities may be received at the discretion of the Faculty with or without examination as regards particular cases.

No student will be received as a candidate for a degree in the College of Letters and Arts after the beginning of the Senior year unless he passes an examination in the Metaphysics and Ethics required in the Junior year.

No student will be admitted to any course of the Senior year until all conditions have been cancelled.

Catholic students who are candidates for any degree are required to take the prescribed Courses in Evidences of Religion.

DEGREES.

BACHELORS.

The courses of study offered to candidates for the degree of Bachelor extend by fixed programs through four scholastic years. In the College of Letters and Arts one of three degrees is conferred on an undergraduate—Bachelor of Arts (A. B.), Bachelor of Letters (Litt. B.), Bachelor of Philosophy (Ph. B.)—dependent on the special program of studies he selects. The College of Science offers five degrees for choice to undergraduates—Bachelor of Science (B. S.), Bachelor of Science in Biology (B. S. Biol.), Bachelor of Science in Chemistry (B. S. Chem.), Graduate in Pharmacy (Ph. G.), Pharmaceutical Chemist (Ph.C.). The College of Engineering offers three degrees—Civil Engineer (C. E.), Mechanical Engineer (M. E.), and Mechanical Engineer in Electrical Engineering (M. E. in E. E.). Two degrees are offered by the College of Architecture—Bachelor of Science

in Architecture (B. S. Arch.), and Bachelor of Science in Architectural Engineering (B. S. Arch. Eng.). In the College of Music one degree is offered, Bachelor of Music (B. Mus.). In order to obtain this degree the candidate must have studied music in the University for one complete year. He must have a thorough theoretical knowledge of four instruments mentioned in the courses described above, and a practical mastery of one of them. He shall pass a written examination in Harmony, Counterpoint and Composition, and he must submit to the examiner two original compositions: (a) a fugue or full orchestra, or for four voices with independent orchestral accompaniment; (b) a composition in the free form (sonata or rondo) for pianoforte, or a trio (pianoforte, violin and violincello).

The degree of Bachelor will not be conferred unless the candidate shall have been in residence for one complete scholastic year in his Senior Year of study.

MASTERS.

The degree of Master is open to students who have received the degree of Bachelor from Notre Dame or from some other college in good standing and who make application to the Committee of the Faculty on Graduate Study for the privilege of pursuing advanced work. All work must be approved by this Committee. One year of residence, at least, is required of candidates who have received their Bachelor's degree at another college. Those who have received their Bachelor's degree from Notre Dame, may, in some cases to be determined by the Committee, obtain the Master's degree for work done *in absentia*. One major and one or two minor courses will constitute the curriculum, forming a consistent, co-ordinated plan of advanced work pursued with some definite aim. On completion of the

required work the candidate must pass a satisfactory examination in writing under the professors who give his subjects of instruction. The candidate for this degree must also write a dissertation of notable merit on some topic connected with his major subject, the thesis to contain in the minimum five thousand words. The subject of the thesis must be announced to the Committee by December 1, and submitted for examination by May 15. Five printed or typewritten copies of the thesis must be presented to the University to be placed in the library. The fee for examination of work done *in absentia* is fixed at twenty-five dollars.

DOCTOR OF PHILOSOPHY.

Three years must be spent by the candidate in University work before the degree of Doctor shall be conferred,—two of these years must be spent at Notre Dame and one at some other University on approval of the Committee of the Faculty on Graduate Study. The candidate must pass satisfactory examinations in French and German on entrance. The work for the degree shall consist of one major and two minor courses of instruction approved by the Committee. Research study shall form the most important part of the candidate's work. On completion of his work the candidate must pass minute examinations on the three subjects of his curriculum and must defend his dissertation before the whole Faculty. The thesis must be printed and one hundred and fifty copies presented presented to the University. A copy of the thesis must be handed to the Committee one month before the examinations. The degree will not be conferred for merely faithful work, and not for miscellaneous study, but for original research and for high attainment in one branch of study. The fee for the degree is fixed at fifty dollars.

DISCIPLINE.

Official reports of each student's class standing will be sent to parents and guardians every two months.

The Faculty maintain that an education which gives little attention to the development of the moral part of a youth's character is pernicious, and that it is impossible to bring about this development where students are granted absolute relaxation from all Faculty government while outside the class-room. A young man must learn obedience to the law by the actual practice of obedience, not merely by appeals to honor.

Moreover, the quiet and concentration of mind that are needed for collegiate work are not obtained except where discipline exists.

Therefore the following regulations, shown by experience to be salutary, are enforced at the University:

1. No student shall leave the University grounds without permission from the President or the person delegated to represent him.

2. *Leave of absence will not be granted to students during the term time, except in cases of urgent necessity. There is no vacation at Easter.*

3. Students are required to report at the University immediately after arriving at South Bend. This rule is binding not only at the beginning of the scholastic year, but at all other times when leave of absence has been granted. Unnecessary delay in South Bend is looked upon as a serious violation of rule.

4. *Flagrant disobedience to authority, cheating in examinations, the use of intoxicating liquors, immorality, the use of profane and obscene language, and an unauthorized absence from the University limits* are among the causes for

expulsion. In case of suspension or expulsion for such offences, *no fees will be returned.*

5. No branch of study shall be taken up or discontinued without the consent of the Director of Studies.

6. Preparatory students are enrolled in Brownson, Carroll or St. Edward's Hall according to age: boys seventeen years of age or older are placed in Brownson Hall; those over thirteen and under seventeen, in Carroll Hall; and those under thirteen, in St. Edward's Hall.

7. The use of tobacco is forbidden except to such students of Sorin, Corby and Brownson Halls as have received from their parents written permission to use tobacco.

8. Continued violation of regulations in Sorin or Corby Hall leads to forfeiture of rooms.

9. *Although students of all religious denominations are received, the University is nevertheless a strictly Catholic institution, and all students are required to attend divine service in the University Church at stated times.*

10. The use of intoxicating liquors is strictly prohibited.

11. Undue attention to athletics at the expense of study will not be permitted, but students are expected to take part in outdoor sports and other games.

12. A limited number of athletic contests is permitted with college organizations from without.

13. All athletic associations of the students are strictly forbidden to countenance anything that savors of professionalism.

14. All athletics are governed by a Faculty Board of Control which will be guided in its rulings by the regulations adopted by the Conference Colleges. The Vice-president of the University and six members of the Faculty will compose this Board, and reserve the right of a final decision on all questions concerning athletics. The

Faculty Board will determine the amateur standing of the members of the athletic teams and apportion the finances. By this means indiscreet and unconsidered action of students will be checked.

LECTURES AND CONCERTS.

Each winter, eminent men are invited to lecture before the students. Among those who have addressed the University in the past few years may be noted four Apostolic Delegates: Cardinals Satolli and Martinelli, and Monsignors Falconio and Agius; Archbishops Ireland, Riordan, Keane, Glennon and Christie, and Bishops Spalding, Alerding, McQuaid, O'Gorman and Shanley. There were also such noted European churchmen as the Abbé Felix Klein and the foremost of living English historians, Dom Gasquet, besides men of letters like Marion Crawford, Maurice Francis Egan, Henry Van Dyke, Seumas MacManus, William Butler Yeats, James Jeffrey Roche, Hamilton Wright Mabie and Henry James, and such men of affairs as Senator Taft, ex-Senator Hill, Senator Beveridge, Secretary of Navy Charles Jerome Bonaparte, William P. Breen and Bourke Cockran. Concerts are given frequently by organizations from without.

EXPENSES.

Matriculation Fee (payable on first entrance).....$ 10.00
BOARD, TUITION, Lodging, Washing, and mending of Linens, per session of nearly Ten Months..... 400.00

PAYABLE IN ADVANCE, as follows:

On Entrance in September:

Matriculation Fee (payable first year only).....$ 10.00
First Payment on Board and Tuition..... 250.00
Deposit on Book and Stationery Account..... 10.00
Special Lecture and Concert Course..... 3.00

Also, in this First Payment must be included any extra Expense the student may wish to incur, such as charges for Private Room, Special Courses (listed below).

On January 15:

Balance on Board and Tuition.....$150.00
and any extra expenses the student may have incurred.

No rebate will be allowed for time absent at the opening of the Sessions, September and January. The charge of $400.00 covers the tuition fee, which is fixed at $100.00 per Scholastic Year. The latter sum is accepted as an entirety for tuition during the Scholastic Year, and will not be refunded in whole or in part if the student be dismissed for wilful infraction of the fundamental rules and regulations herein stated and hereby brought to his notice; and so likewise in the event of his leaving and absenting himself from the University at any time or for any cause without proper permission. However, an exception is made if it seems to be expedient for him to go to his home because of severe or protracted illness. *Degrees will not be conferred on any student whose account with the University has not been settled.*

SPECIAL EXPENSES—PAYABLE IN ADVANCE:

For whole Session of nearly Ten Months.

PRIVATE ROOMS—

Seniors, Juniors, and Sopnomores, Free; Freshmen....$50.00
Preparatory Students.....$80.00

While the students, as a rule, are advised to confine themselves to the regular studies of the program they have entered, any of the following may be taken at the rate mentioned per Scholastic Year. The charges will be *pro rata* for any portion of the year.

Instrumental Music—Lessons on Piano and use of Instrument	$60.00	Vocal Culture	$40.00
Use of Piano for Advanced Students	30.00	Elocution — Special Course	10.00
Typewriting—Full Course	20.00	Use of Library	5.00
Typewriting — Short Course (20 Lessons)	5.00	"Scholastic"—College Paper	1.50
Phonography	25.00	Telegraphy	25.00
Practical Mechanics	30.00	Artistic Drawing	25.00
Lessons on Violin, Guitar, Flute, Cornet, Clarinet or Mandolin	30.00	Applied Electricity	40.00
Use of each Instrument	5.00	Special Lecture and Concert Course Ticket	3.00
		Gymnastics—Full Course (20 Lessons)	5.00

Laboratory Fees Listed under Regular Courses.

DIPLOMA FEES.

For degree of Ph. D., $50.00; for Master's Degrees, $10.00; for all College Courses leading to degrees, $10.00; Commercial Course, $5.00. Short Courses in Electricity and Mechanical Engineering, $5.00; Telegraphy, $5.00.

REMARKS.

The Entrance Fee, cost of Books, Music and Laboratory Fees, etc., are required with the first payment.

Remittance should be made by draft, postoffice money order or express, payable to the order of the President.

Checks on local banks are not accepted unless exchange is included.

Term bills and other accounts are subject to sight draft if not paid within ten days after they have been rendered.

Sorin, Corby, Brownson and Carroll Halls are closed during the months of July and August. Students wishing to spend their Summer Vacation under the care of the University authorities can be accomodated at San José Park, Lawton, Michigan.

In consequence of benefactions lately received by the University, a limited number of students aspiring to the ecclesiastical state can be received at special rates. Fuller information can be obtained by addressing the President.

College of Arts and Letters.

Department of Classics

Department of Letters

Department of History

and Economics

COLLEGE OF ARTS AND LETTERS.

ENTRANCE EXAMINATIONS.

English — Part of the examination time is given for answering questions upon books required to be read in the preparatory courses in English; the remainder, for writing an essay.

Latin — Grammar, complete; Cæsar, four books of the Gallic War; Cicero, four orations against Catiline; Vergil, Aeneid, six books; translation at sight of passages from Cicero and Cæsar; translation of English into Latin based on the text of the authors.

Greek — (For Students in the Department of Classics only) Grammar, etymology, and general rules of syntax; Xenophon, Anabasis, four books; Homer, at least three books; prose composition based on text.

History — A general knowledge of the outlines of Greek and Roman History and of Medieval and Modern History, as set out in the texts used in high schools and other secondary schools.

Civil Government — The Constitution of the United States; Federal Government and State Government.

Algebra — The whole subject as far as logarithms, as given in Wentworth's *College Algebra*, or an equivalent in the larger treatises of other authors.

Geometry — Plane and Solid including the solution of simple original problems and numerical examples as given in the works of Wentworth, Chauvenet, Newcomb, or an equivalent in treatises by other authors.

Physical Geography—As given in Tarr's text-book or an equivalent treatise.

Zoology — Elementary.

Physiology — Martin's *Human Body*, or an equivalent.

Botany — Elementary.

Chemistry — Elements of inorganic chemistry. The preparation in this subject must include a course of lectures and recitations, and laboratory work in which at least fifty experiments have been exemplified.

Physics — Elementary. The preparation in this subject should include a course of lectures illustrated by experiments, and recitations from a text-book similar to Carhart and Chute's or Gage's. Laboratory work is recommended, but is not required.

French and German — A three year's study of either German or French and one year of French or German is required for entrance on the program in Letters and the program in History and Economics. Students who began French in the second preparatory year must have taken up German in the fourth preparatory year and shall continue it for two years in the college course. A like regulation holds for those who began German in the second preparatory year. Students in the Department of Classics present a year of French or German.

The entrance examination requires sight translation of ordinary German or French prose: an ability to translate, rather than accurate grammatical knowledge is expected.

Studies Prescribed for the Degree of Bachelor of Arts.

FRESHMAN YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION		SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION	
		Page	Course			Page	Course
Latin - - -	4	99	I.	Latin - -	4	99	II.
Greek - -	4	96	I.	Greek - - -	4	96	II.
English - -	3	101	I.	English - -	3	101	I.
History - -	4	108	I.	History - -	4	108	I.
Elocution - -	1	112	III.	Elocution -	1	112	IV.
Elocution. -	1	113	VIII.	Elocution - -	1	113	VIII.

SOPHOMORE YEAR.

Latin - - -	4	99	III.	Latin - -	4	99	IV.
Greek - -	4	96	III.	Greek - - -	4	96	IV.
Philosophy -	4	94	I.	Philosophy -	4	94	I.
English - -	3	102	II.	English - -	3	102	II.
Elocution -	1	113	VIII.	Elocution - -	1	113	VIII.

JUNIOR YEAR.

Latin - - -	4	99	V.	Latin - - -	4	100	VI.
Greek - -	4	96	V.	Greek - -	4	97	VI.
Philosophy -	4	94	II.	Philosophy -	4	94	II.
English - -	3	102	III.	English - -	3	102	III.
Elocution - -	1	113	VIII	Elocution -	1	113	VIII.

SENIOR YEAR.

Latin - - -	4	100	VII.	Latin - - -	4	101	VIII.
Greek - -	4	97	VII.	Greek - -	4	98	VIII.
Philosophy - -	4	95	III.	Philosophy -	4	95	III.
English - -	3	103	IV.	English - -	3	103	IV.
Elocution - -	1	112	VI.	Elocution - -	1	113	VII.

Studies Prescribed for the Degree of Bachelor of Letters.

FRESHMAN YEAR.

SUBJECTS: FIRST TERM.	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS: SECOND TERM.	Hrs. a Week	SEE EOR DESCRIPTION Page	Cours
English - -	3	101	I.	English - -	3	101	I.
Latin or Elective	4 5	99	I.	Latin or Elective	4 5	99	II.
French or German	3 3	105 104	II. II.	French or German	3 3	105 104	II. II.
History - -	4	108	I.	History - -	4	108	I.
Elocution - -	1	112	III.	Elocution -	1	112	IV.
Elocution -	1	113	VIII.	Elocution - -	1	113	VIII.

SOPHOMORE YEAR.

English - -	3	102	II.	English - -	3	102	II.
Philosophy -	4	94	I.	Philosophy -	4	94	I.
Latin or Elective	4 5	99	III.	Latin or Elective	4 5	99	IV.
French or German	2 2	105 104	III. III.	French or German	2 2	105 104	III. III.
History - -	3	108	II a.	History - -	3	108	II a.
Elocution - -	1	113	VIII.	Elocution -	1	113	VIII.

JUNIOR YEAR.

English - -	3	102	III.	English - -	3	102	III.
Latin or Elective	4 5	99	V.	Latin or Elective	4 5	100	VI.
Philosophy -	4	94	II.	Philosophy - -	4	94	II.
History - -	4	108	III.	History - -	4	108	III.
Elocution - -	1	113	VIII.	Elocution - -	1	113	VIII.

SENIOR YEAR.

English - -	3	103	IV.	English - -	3	103	IV.
Latin or Elective	4 5	100	VII.	Latin or Elective	4 5	101	VIII.
Philosophy -	4	95	III.	Philosophy -	4	95	III.
Elective - -	4			Elective - -	4		
Elocution -	1	112	VI.	Elocution -	1	113	VII.

Studies Prescribed for the Degree of Bachelor of Philosophy.

FRESHMAN YEAR.

SUBJECTS: FIRST TERM.	Hrs. a Week	SEE FOR DESCRIPTION. Page.	Course	SUBJECTS: SECOND TERM.	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
History - -	4	108	I	History - -	4	108	I
English - -	3	101	I	English - -	3	101	I
French or German	3	105	II	French or German	3	105	II
	3	104	II		3	104	II
Spanish - -	5	106	I	Spanish - -	5	106	I
Elocution - -	1	112	III	Elocution -	1	112	IV
Elocution -	1	113	VIII	Elocution - -	1	113	VIII

SOPHOMORE YEAR.

History - -	3	108	II a	History - -	3	108	II a
Political Science - -	4	110	I	Political Science -	4	110	II
Philosophy -	4	94	I	Philosophy -	4	94	I
English - -	3	102	II	English - -	3	102	II
German or French	2	104	III	German or French	2	104	III
	2	105	III		2	105	III
Elocution -	1	113	VIII	Elocution -	1	113	VIII

JUNIOR YEAR.

History - -	4	108	II b	History - -	4	109	IV a
Political Science - -	4	110	III	Political Science -	4	110	IV
Philosophy -	4	94	II	Philosophy - -	4	94	II
History - - -	4	108	III	History - -	4	108	III
Elocution -	1	113	VIII	Elocution - -	1	113	VIII

SENIOR YEAR.

History - -	3	109	IV b	History - -	3	109	IV b
Political		110	V VI	Political		111	VI
Science - -	6	111	VII	Science -	6	111	VII, VIII
Philosophy -	4	95	III	Philosophy -	4	95	III
English - - -	3	102	III	English - -	3	102	III
Elocution -	1	112	VI	Elocution - -	1	113	VII

College of Science.

Department of Biology

Department of Chemistry

Department of Pharmacy

COLLEGE OF SCIENCE.

REQUIREMENTS FOR ADMISSION.

Candidates for the Freshman class of the four year programs must be prepared to pass an examination in the branches named below, unless satisfactory assurance of proficiency is given by approved certificate.

Physical Geography—As given in Tarr's text-book or an equivalent treatise.

Physiology— Martin's *Human Body* or an equivalent.

Zoology—Elementary.

Botany—Elementary.

Civil Government—The American Constitution. Federal and State Government.

History—General outlines of Ancient, Medieval and Modern History.

Algebra—The whole subject as far as logarithms, as given in Wentworth's *College Algebra*, or an equivalent in the larger treatises of other authors.

Geometry—Plane and Solid, including the solution of simple original problems and numerical examples, as given in the works of Wentworth, Chauvenet, Newcomb, or an equivalent in treatises by other authors.

Trigonometry—Plain and Spherical.

Astronomy—Descriptive.

Chemistry—A course of at least fifty experiments in elementary chemistry actually performed by the pupil.

German—A two year course in German is required. Ability to translate at sight easy German into English, and easy English into German.

English—Part of the examination is given for answering questions upon books required to be read in the

preparatory courses in English; the remainder for writing an essay.

Physics — Elementary. The preparation on this subject should include a course of lectures, illustrated by experiments, and recitations from a text-book similar to Carhart and Chute's or Gage's. Laboratory work is recommended, but is not required.

Latin — Grammar, complete; Cæsar, four books of the Gallic War; translation of English into Latin based on text of Cæsar.

THE PROGRAM OF GENERAL SCIENCE.

The Program in General Science is calculated to afford such an acquaintance with the methods and facts of modern science as will best enable the student to fit himself, either for further study of a technical or professional kind, or for the activities of business life. The Natural and Physical Sciences constitute the primary studies of this program. Grouped about these are those studies in English, Mathematics, and Modern Languages, which experience has shown to be necessary for the intelligent pursuit of science and for the attainment of the object of the program.

Two essays on scientific topics are required of every student in the Sophomore year and two in the Junior year.

The scientific work of the Senior year is elective. Advanced courses may be chosen in Physics, Chemistry, Biology and Mathematics.

Every candidate for a degree in the Program of General Science is required to submit, before the final examination, a written thesis upon some subject connected with the elective work of the Senior year. The subject chosen must have the approval of the professor in the course elected. The thesis shall contain no less than five thousand words, and must be satisfactory in matter and treatment.

Students who complete the required courses, pass the final examination, and present a satisfactory thesis will receive the degree of Bachelor of Science.

In the schedule an "hour" means two sixty minute periods of laboratory work or one of lecture or recitation.

LABORATORY FEES.

Chemistry I., VII., each	$ 5.00
Chemistry III., II., IV., V., VI., VIII, IX., XI., XIII, each	10.00
Physics III.	5.00

Studies Prescribed for Program in General Science.

(DEGREE: BACHELOR OF SCIENCE.)

FRESHMAN YEAR.

SUBJECTS: First Term.	Hrs. a Week	See for Description		SUBJECTS: Second Year.	Hrs. a Week	See for Description	
		Page	Course			Page	Course
Zoology - -	5	146	I	Zoology - -	6	146	I
Chemistry -	4	139	III	Chemistry -	4	139	III
Algebra - -	5	113	I	An. Geometry	5	114	II
Drawing - -	2	153	I	Drawing - -	1	153	II
Physiology -	4	149	I	Physiology -	4	149	I

SOPHOMORE YEAR.

Botany - -	5	144	I, II	Botany - -	5	145	I, II
Chemistry -	4	140	IV	Physics - -	5	138	II, III
Physics - -	5	138	II, III	Calculus - -	5	115	IV, V
Calculus - -	5	114	III	Elective - -	5		

JUNIOR YEAR.

Geology - -	2	137	I	Geology - -	4	137	III
Elective - -	5			Astronomy -	3	136	I
English - -	3	101	I	English - -	3	101	I
French - -	5	105	I	French - -	5	105	I
Philosophy -	4	94	I	Philosophy -	4	94	I

SENIOR YEAR.

Philosophy -	4	94	II	Philosophy -	4	94	II
Three Elect'vs in Science -	9-12			Three Elect'vs in Science -	9-12		
French or German -	3	105	II	French or German -	3	105	II
	3	104	II		3	104	II

THE PROGRAM IN CHEMISTRY.

This program is intended for students who wish to obtain such a knowledge of chemistry as may fit them for professional work either in the laboratory or the classroom. Though fixed to a great extent, the schedule of work admits in the Junior and Senior year of some elective study.

Every candidate for a degree in Chemistry is required to write an essay in the Junior year on some subject connected with Chemistry and must submit, at least four weeks before the final examination, a written thesis on work covered in his Senior year. This thesis must contain at least three thousand words.

The degree of Bachelor of Science in Chemistry is given to those students who have written an approved thesis and have passed a satisfactory examination.

In the schedule, an "hour" means two sixty minute periods of laboratory work or one of lecture or recitation.

LABORATORY FEES.

Chemistry I., VII., each	$ 5.00
Chemistry II., III., IV., V., VI., VIII., IX., XI., XIII., each	10.00
Physics III	5.00

Studies Prescribed for the Degree of Bachelor of Science in Chemistry.

FRESHMAN YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION		SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION	
		Page	Course			Page	Course
Chemistry -	4	139	III	Chemistry -	4	139	III
Algebra - -	5	113	I	Anal. Geom. -	5	114	II
French - - -	5	105	I	French - - -	5	105	I
Physics - -	5	138	II, III	Physics - -	5	138	II, III

SOPHOMORE YEAR.

Chemistry -	4	140	IV	Chemistry - -	4	140	V
Calculus - -	5	114	III	Calculus - -	5	115	IV, V
Geology - -	2	137	I	Geology - -	4	137	III
Chemistry -	5	141	VI	Chemistry -	6	142	IX
Gas Analysis -	4	141	VIII				

JUNIOR YEAR.

Chemistry -	7	142	IX	Chemistry -	7	142 143	XI, XIII
Chemistry Elective -	5			Chemistry Elective - -	5		
Elective - -	5			Assaying - -	2	137	II
English - -	3	101	I	English - -	3	101	I

SENIOR YEAR.

Philosophy -	4	94	II	Philosophy -	4	94	II
History of Chemistry -	3	143	XII	Chemistry Elective -	5		
Elective - -	5			Scientific Readings in German and	2		
Scientific Readings in German and	2			French - -	2		
French - -	2			Thesis - - -			

THE PROGRAM IN BIOLOGY.

The Program in Biology has been designed for students who wish to devote their time largely to biological pursuits, either as an immediate preparation for the study of medicine or veterinary science, or with a view to teaching or otherwise engaging in biological research. The students in this program are required to prepare an essay during the first term of the Junior Year on some subject pertaining to biology. Every candidate for a degree must submit before the final examinations a written thesis accompanied with original drawings. Students not preparing themselves for a medical course may substitute for the advanced courses in Anatomy and Physiology equivalents from either Mathematics, Physics, or English Literature.

LABORATORY FEES.

Biological Laboratory—*Zoology I., II.*	5.00
Botanical Laboratory—*Botany II. and III.*	5.00
Microscopy—*for Courses I. and II.*	2.50
Bacteriological Laboratory—*Bacteriology*	10.00
Physics III	5.00
Chemistry III., IV., V., VI., each	10.00

Studies Prescribed for the Degree of Bachelor of Science in Biology.

FRESHMAN YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION		SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION	
		Page	Course			Page	Course
Zoology - -	5	146	I	Zoology - -	6	146	I
Chemistry -	4	139	III	Chemistry -	4	139	III
Microscopy -	2	147	I	English - -	3	101	I
English - - -	3	101	I	French - - -	5	105	I
French - -	5	105	I	Drawing - -	1	155	IX
Drawing - -	1	155	IX				

SOPHOMORE YEAR.

Physiology -	4	149	I	Physiology -	4	149	I
Botany - - -	5	144	I, II	Botany - - -	5	144	I, II
Chemistry -	4	149	IV	Chemistry -	4	140	V
Physics - -	5	138	II, III	Physics - -	5	138	II, III
Drawing - -	1	155	X	Drawing - -	1	155	X

JUNIOR YEAR.

Anatomy -	3	148	III	Anatomy - -	3	148	III
Botany - - -	6	145	III, IV	Botany - - -	4	145	III, IV
Geology - -	2	137	I	Geology - -	4	137	III
Philosophy -	4	94	I	Philosophy -	4	94	I
Bacteriology -	3	150	I	Chemistry -	5	141	VI

SENIOR YEAR.

Anatomy - -	5	148	II, III	Anatomy -	5	148	II, III
Physiology -	6	149	II	Physiology - -	6	149	II
Zoology - -	6	147	II	Zoology - -	6	147	II
Thesis - - -				Thesis - - -			

PROGRAMS IN PHARMACY.

There are two programs in Pharmacy: one of two years, leading to the degree *Graduate in Pharmacy*, (*Ph. G.*); and another of three years leading to the degree, *Pharmaceutical Chemist*, (*Ph. C.*)

ADMISSION.

Applicants for admission to the Short Program must be 18 years of age, and must pass an examination in the common English branches. A certificate of admission to a high school will be accepted instead of an examination.

The requirements for the long program are the same, except that an examination in Latin through Cæsar and Algebra as far as logarithms must be passed. Satisfactory evidence of having spent two years in a high school of the best grade will be accepted instead of an examination.

METHODS.

The subjects studied in this department are intended to impart a thorough theoretical as well as a practical knowledge of Pharmacy, the work commencing with the simplest and gradually leading up to the most difficult and complicated processes.

Special attention is given to the little details, which are essential to success, in any professional work and particularly so in Pharmacy. The student is carefully drilled in store etiquette, business hints, prescription work, and dispensing. Neatness and order in all the operations and extreme care in the manufacture of

preparations are required throughout the course.

Attention is given to Animal Extracts, Serum-Therapy, Antitoxins, new Synthetic Remedies and Alkaloidal Medication.

EQUIPMENT.

Each desk is supplied with all the apparatus necessary for ordinary work. Special apparatus is furnished as required.

The department contains a fully equipped Drug Store in which the student obtains practically the same experience that he would get in actual business. A second year student is placed in full charge. He is required to furnish supplies for the department, order material, write business letters, invoice stock, etc. Then at the end of a specified time he delivers the store in good order to his successor.

About 2,000 recent prescriptions written by physicians, and taken from the files of a drug store, constitute a very important part of the equipment. Under supervision of the instructor each student is required to read them and to compound those requiring special manipulation. The reading room is supplied with all the leading pharmaceutical journals and books of reference. The Pharmacognosy room contains specimens of all the official and a great many unofficial drugs for study and identification.

THESIS.

During the third year the student is required to spend at least two hours a week in original research on a subject within the domain of Pharmacy. The results of this work are carefully recorded and must be typewritten and presented to the Faculty as a requirement for graduation.

LABORATORY FEES.

Pharmaceutical Laboratory II	$20.00
Pharmaceutical Laboratory III. and IV. each	20.00
Pharmaceutical Laboratory VI. and VII	40.00
Chemistry I	5.00
Chemistry IV., V., each	10.00
Microscopy	2-50

Programs in the Department of Pharmacy.

DEGREES: Ph. G., Ph. C.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
Pharmacy -	3	150	I	Pharmacy -	6	150	I, II
Arithmetic - -	3	152	IX	Physics - - -	5	183	F I
Botany - -	5	144	I, II	Chemistry -	2	142	X
Microscopy -	2	147	I	Botany - - -	5	144	I
Chemistry -	5	139	I	Mat'ra Medica	2	152	VIII (1, 2.)

SECOND YEAR.

Pharmacy - -	8	151	III, IV	Pharmacy - -	8	151	V, VI
Chemistry -	4	140	IV	Chemistry -	4	140	V
Mat'ra Medica	3	152	VIII (1, 3.)	Mat'ra Medica	3	152	VIII (2, 3.)
Bacteriology -	3	150	I	Physiology -	4	149	I

THIRD YEAR.

Pharmacy - -	5	151	VI	Pharmacy -	5	151	VII
Chemistry -	5	141	VI	Chemistry - -	5	141	XIV
Geology - -	2	137	I	Toxicology and Urin'y An	3	141	VII
Thesis - - -	2			Thesis - - -	2		
Elective - -	5			Elective - -	5		

College of Engineering

Department of Civil Engineering

Department of Mechanical Engineering

Department of Electrical Engineering

COLLEGE OF ENGINEERING.

In the industrial development of a country the engineer takes an important part. Many new industries are springing up and the great activity in those already established throughout the world creates a demand for the services of trained engineers.

The programs of studies in the three departments of engineering at Notre Dame are arranged to give a knowledge of the fundamental facts and theories that are applied in engineering work. Mathematics is foremost among these requirements. The natural sciences receive their share of attention and due importance is given to languages in arranging the programs of studies.

Laboratory work and field work give a certain amount of practice in the application of the theory to actual physical conditions. These conditions are made to correspond as closely as possible to the real work of the engineer.

A student who has no liking for mathematics should not be encouraged to take up an engineering course. The successful engineer is one who thinks clearly and acts accurately. Clear thinking is necessary to master mathematical subjects and skill and accuracy are acquired by applying the results of mathematical calculations to particular practical cases in laboratory work.

Three regular programs of studies have been arranged: one leading to the degree of Civil Engineer, one to the degree of Mechanical Engineer, and one to the degree of Mechanical Engineer in Electrical Engineering.

Special Short Courses in Electrical and Mechanical Engineering are offered to accomodate those who wish

to fit themselves for practical work in the shortest possible time.

The various laboratories are equipped with the most approved forms of instruments and appliances and considerable time is given to technical work.

(For list of available apparatus, see pages 13-22.)

In the schedules of studies one hour of credit is given for each recitation or lecture which requires from one to two hours' preparation. Two hours actual time in laboratory work, shopwork or drawing are required for each hour on the schedule.

EXPENSES.

In addition to the regular fee for matriculation, board, tuition, lodging, etc., as given on page 33, the regular students in the three Engineering Programs are required to pay laboratory fees to cover, in part, the cost of materials consumed and the deterioration of the apparatus used, as follows:

LABORATORY FEES.

Physical Laboratory III	$ 5.00
Physical Laboratory IV	15.00
Electrical Laboratory I., II	15.00
Electrical Laboratory IV	15.00
Shopwork, all four-year programs, per term	15.00
Chemistry I	5.00
Chemistry II., IV., V., each	10.00

ACADEMIC REQUIREMENTS FOR ADMISSION TO THE COLLEGE OF ENGINEERING.

Algebra. The whole subject as far as logarithms as given in Wentworth's *College Algebra*, or an equivalent in the larger treatises of other authors.

Geometry—Plane and Solid, including the solution of simple original problems and numerical examples, as given in the works of Wentworth, Chauvenet, Newcomb, or an equivalent in treatises by other authors.

Trigonometry—Plane and Spherical.

Astronomy—Descriptive.

Civics—The Constitution of the United States. Federal Government and State Government.

History—General outlines of Ancient, Medieval and Modern History.

Geography—Physical, as much as is contained in Tarr's text-book or an equivalent treatise.

Physics—Elementary. The preparation on this subject should include a course of lectures, illustrated by experiments, and recitations from a text-book similar to Carhart and Chute's or Gage's. Laboratory work is recommended, but is not required.

Chemistry—The elements of Inorganic Chemistry. Laboratory work required.

Botany, Physiology and Zoology—As given in elementary text-books.

Modern Language—Engineering students must present a two years' course in German.

English—Part of the examination time is given for answering questions upon books required to be read in the preparatory courses in English; the remainder for writing an essay.

If the applicant passes these examinations satisfactorily

he may begin at once the regular Freshman work; but if he is deficient in any one or more subjects he may enter conditionally and make up his deficiency as soon as possible in the Preparatory Department.

Credits from High Schools or preparatory schools in good standing will be accepted in place of examinations.

THE DEPARTMENT OF CIVIL ENGINEERING

The courses of instruction are designed to prepare students for a thorough and systematic training in the sciences and in the principles of Civil Engineering, to perform intelligently the duties of their profession either in the office or in some of the responsible positions superintending the construction and operation of public works. To secure these results the student is given, not only a sound theoretical training in the courses of study, but he is also required to study the practical applications of the principles upon which the theory is based. The first two years are devoted to the study of mathematics and the theoretical branches. The last two years are given to the study of applied courses—practical work in the laboratory and field, as much as possible, being required throughout the course.

Sufficient instruction is given in French and German to enable the student to read easily and intelligently professional works in these languages; and the study of English is pursued until the student is qualified to prepare acceptable themes on professional subjects. Instruction based upon standard text-books on engineering is given throughout the course by means of lectures, recitations, practice in laboratory, drawing-room and field. This work is largely supplemented by assigning to the student, for solution, practical problems bearing directly upon the subject matter discussed in the class room and requiring original investigation, thus training the student to habits of independence and awakening his interest in the work of his profession.

The Department is provided with all the instruments necessary for effective work in the different branches of

field engineering. After the student is taught the use and adjustment of the instruments, surveys, elementary in character, are commenced and continued progressively until the more difficult principles and methods are understood. In a similar manner is instruction given in the courses of Sanitary Engineering, Hydromechanics, Resistance of Materials, Bridges and Roofs, etc., thus familiarizing the student with practical engineering subjects, and the most improved method of execution and designing.

A thesis on some subject approved by the head of the Department connected with the course of study, is required of each student as a condition of graduation. The thesis must embody the results of original research.

(For equipment and facilities see pages 13-19.)

Studies Prescribed for the Degree of Civil Engineer.

FRESHMAN YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs a Week	SEE FOR DESCRIPTION Page	Course
Algebra - -	5	113	I.	Anal. Geom.	5	114	II.
English - -	3	101	I.	French - -	5	105	I.
French - -	5	105	I.	Chemistry -	3	139	II.
Chemistry	3	139	II.	Drawing - -	2	153	II.
Drawing -	3	153	I., II.	Surveying -	5	116	II. III.

SOPHOMORE YEAR.

Calculus - -	5	114	III.	Calculus - -	5	115	IV. V.
Des. Geometry	3	116	I.	Des. Geometry	3	116	I.
R.R. Survey'g	5	117	VI. VII.	Adv. Survey'g	5	117	IV., V.
Physics - -	5	138	II. III.	Physics - -	5	138	II, III.
Drawing -	1	153	V.	Drawing -	1	153	V.

JUNIOR YEAR.

Analytic Mechanics -	5	118	VIII.	An. Mechanics	2	118	VIII
Geodesy - -	4	119	IX.	Mechanics of Materials -	3	119	X.
English - -	3	102	II.	Astronomy -	3	136	I.
Geology - -	2	137	I.	English - -	3	102	II.
Stereotomy -	3	154	VI.	Geology - -	4	137	III.
				Drawing - -	3	154	VII.

SENIOR YEAR.

Engineering -	5	120	XII.	Engineering -	5	120	XII.
Hydromechan	3	123	XVI.	Hydromechan	3	123	XVI.
Bridges, Roofs	5	122	XIV.	Graph. Stat. -	5	122	XV.
Sanitary Eng.	2	121	XIII.	Sanitary Eng.	2	121	XIII.
Drawing - -	3	154	VII.	Roads, Pav'mt	4	120	XI.
				Thesis - - -			

THE DEPARTMENT OF MECHANICAL ENGINEERING.

The program of studies in Mechanical Engineering, leading to the degree of Mechanical Engineer, is open to young men who wish to prepare themselves for the designing of machinery, with its appurtenances, and for the successful management of power plants. As the program requires a thorough knowledge of pure and applied Mathematics, as well as of Physics, only those capable of adapting themselves to these requirements should take it up. The program of the department is modeled in the twofold belief that a thorough fundamental training is best secured by a study of the practical application of the principles involved, as well as of the theoretical principles.

The work of the department, conducted in connection with other departments elsewhere described, consists of the study, by text-book or lectures, of the materials used in mechanical engineering, accompanied by the science of pure mechanical kinematics, which traces the motions of connected parts without reference to the cause of such motions, to the work done or energy transmitted. This is succeeded by machine design, which is a direct development of kinematics, and the course continues throughout the Junior and Senior years.

The courses in Shopwork are most complete. The first year's work is confined to practice in the woodshop, in which the principles of carpentry, turning, and pattern-making are taught. When the students have become sufficiently skilled in woodwork, they take up the work of the foundry, blacksmith shop, and machine shop. A systematic course of training is provided, which advances

the student by easy steps until he has mastered all the details of the work.

The latter part of the Senior year is largely taken up in the preparation of a graduation thesis. Here especially the student is taught to depend as much as possible upon his own resources and abilities in exercising his ingenuity. This is the culmination effort of the program, embodying its chief results, and is expected to show considerable originality.

Every possible advantage is given the student wishing to specialize in some one of the branches of engineering, toward furthering his knowledge and ability in the particular field desired. He may take up general machine design, steam engine design, specifications and contracts, installation and erecting, original research or gas engine design and operation. A systematic curriculum of study will be outlined in each individual case leading to a complete and proficient knowledge of the work undertaken.

Access may be had to all the machinery and apparatus of the University contained in the various power plants and laboratories elsewhere described, and every effort is made by the authorities to make the work as comprehensive as possible.

(For equipment and facilities see pages 13–22.)

Studies Prescribed for the Degree of Mechanical Engineer

FRESHMAN YEAR.

SUBJECTS FIRTS TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
Algebra - -	5	113	I	Analyt. Geom	5	114	II
French - -	5	105	I	French - -	5	105	I
Drawing - -	3	153	I	Drawing - -	3	153	II
Chemistry -	3	139	II	Chemistry -	3	139	II
Shopwork -	3	130	XIV a	Shopwork -	3	131	XIV b

SOPHOMORE YEAR.

Calculus - -	5	114	III	Calculus - -	5	115	IV, V
Drawing - -	3	154	VIII	Drawing - -	3	154	VIII
Chemistry -	4	140	IV	Chemistry -	4	140	V
Physics - -	5	138	II, III	Physics - -	5	138	II, III
Shopwork -	3	131	XIV c	Shopwork -	3	131	XIV d

JUNIOR YEAR.

An. Mechanics	5	118	VIII	An. Mechanics	2	118	VIII
Kinematics -	5	125	V	Mech's of Mat	3	119	X
English - -	3	101	I	Mach'n Design	3	125	VI
Physics - -	3	138	IV	Valve Gears	2	126	VII
Shopwork -	3	131	XIV e	English - -	3	101	I
				Physics -	3	138	IV
				Shopwork -	3	131	XIV f

SENIOR YEAR.

Materials of Engineering	2	124	II	Steam Engine Design - -	5	124	III
Thermod'nam	5	123	I	Steam Boilers	3	124	IV
Steam Engine Design -	5	124	III	Hydraulics -	5	126	IX
Mechan'l Lab	3	126	VIII	Thesis - - -			
Shopwork -	3	131	XIV f				

TWO-YEAR PROGRAM IN MECHANICAL ENGINEERING.

Theory, Design, and Operation of Gas, Oil, and Vapor Engines.

This program is devoted exclusively to the study of explosive motors, and embraces it in theory, design, construction and operation.

The rapid progress made in recent years in the design of gas engines, together with their adaptation to the supplying of power for almost every requirement, has led to the establishment of this program for young men wishing to make a special study of this branch of engineering.

The essential work of the first year consists of a general descriptive study of the different types of engines with discussions on the general management, operation, care and special uses to which this type of motor may be applied. During the second year the general theory of the gas engine is studied and the design of an engine for a specific purpose is undertaken by each student.

The laboratory work will consist in part of indicator practice, determination of mechanical and thermodynamic efficiency, speed regulation, and economy. Experiments in flame, electric and hot tube ignition, operation of vaporizers aud curburetters, construction of spark coils with management and care of motors will complete the work.

The courses in shopwork are intended to give practical application to the theories advanced in the class room by the complete building and testing of a gas engine of a design to be selected by the demonstrator. Each student is required to prepare the patterns and core-boxes, machine the castings and forgings, assemble the complete

engine and submit a comprehensive report of a test on the machine constructed. If the report proves satisfactory, a certificate of proficiency is given to the student and the gas engine becomes his own property.

For admission to this program the student must certify by examination or certificate evidence of a knowledge of Algebra as far as logarithms and his further ability to pursue the studies of the first year. Candidates shall also write a short essay, which must be satisfactory in spelling, punctuation, sentence and paragraph construction.

(For equipment and facilities see pages 16–18.)

Studies Prescribed for Short Program in Mechanical Engineering.

FIRST YEAR.

SUBJECTS: FIRST TERM.	Hrs. a Week	SEE FOR DESCRIPTION		SUBJECTS: SECOND YEAR.	Hrs. a Week	SEE FOR DESCRIPTION	
		Page	Course			Page	Course
Geometry - - -	5	179	E	Trigonometry	5	180	H
Drawing - - -	2	153	I	Drawing - - -	2	153	II
Shopwork - -	3	130	XIV a	Shopwork - -	3	131	XIVb
Chemistry - -	5	182	EI	Physics - - - -	5	183	FI
Gas Engines -	5	127	XI	VaporEngines	5	127	XI

SECOND YEAR.

Motor Design	15	127	XII	Motor Design	10	127	XII
Gas Engine -	3	128	XIII	Gas Engine -	3	128	XIII
Laboratory - -	3	126	VIII	Laboratory - -	3	126	VIII
				Engines and Boilers - - -	3	126	X

DEPARTMENT OF ELECTRICAL ENGINEERING.

The remarkable development of electrical industries during the past few years has created a demand for men skilled in the theory and practice of electrical and mechanical work. The study of the subjects arranged in the program of Electrical Engineering is intended to give a general education as well as a special training in the technical branches involved in the various practical applications of electricity in industrial operations.

General theory is given in lectures and by recitations from standard text-books. In the laboratories and shops the operations explained in the class room are performed by the student, in doing which he acquires some skill in handling tools and instruments, and obtains a working knowledge of the principles involved. Careful records of the work done in laboratories are kept by the student and are handed in for suggestions and corrections at the end of every week.

The University is located near a great manufacturing center in the growth of which electricity is taking a very prominent part. Electric power generated by steam is now being distributed and utilized in several large plants, some using the three phase alternating system, while others are using the direct current. One of the largest water power developments in the Middle West is situated within a few miles of the University. From this establishment we receive three phase alternating currents which furnish light for our buildings and grounds, and power for driving motors in our shops and printing offices, etc., all of which are operated by electricity.

There are numerous other transmission lines and electrical power plants operated by water power within

a short distance. Our students visit all of these plants, accompanied by an instructor who points out the applications of the text-book theory in the design of electrical apparatus and its operation under actual working conditions.

Each candidate for graduation must present at the end of the Senior year an acceptable thesis embodying the results of an extended original research on an engineering subject, chosen at the beginning of the year, with the approval of the head of the department. The descriptive part must be typewritten on legal cap paper, and bound in book form together with the drawings.

(For equipment see pages 9–19.)

Studies Prescribed for the Degree of Mechanical Engineer in Electrical Engineering.

FRESHMAN YEAR.

SUBJECTS: FIRST TERM.	Hrs. a Week	SEE FOR DESCRIPTION. Page.	Course	SUBJECTS: SECOND TERM.	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
Algebra - - - -	5	113	I	Analyt. Geom.	5	114	II
French - - - -	5	105	I	French - - - -	5	105	I
Drawing - - -	3	153	I	Drawing - - -	3	153	II
Chemistry - -	3	139	II	Chemistry - -	3	139	II
Shopwork - -	3	130	XIV a	Shopwork - -	3	131	XIV b

SOPHOMORE YEAR.

Calculus - - -	5	114	III	Calculus - - -	5	115	IV, V
Des. Geom. - -	4	153	III	Des. Geom. - -	4	153	III
Physics - - - -	5	138	II, III	Physics - - - -	5	138	II, III
Shopwork - -	3	131	XIV c	Shopwork - -	3	131	XIV d

JUNIOR YEAR.

Analytic Mechanics -	5	118	VIII	An. Mechanics	2	118	VIII
Kinematics - -	5	125	V	Mech's of Mat.	3	119	X
English - - - -	3	101	I	Machine Design - - -	5	125 126	VI, VII
Physics - - - -	3	138	IV	English - - - -	3	101	I
Shopwork - -	3	131	XIV e	Physics - - - -	3	138	IV
				Shopwork - -	3	131	XIV f

SENIOR YEAR.

Dynamo Machinery -	5	129	III	Dynamo Machinery -	5	129	III
Thermodyn'm	5	123	I	Electrical Lab	5	130	IV
Electrical Lab	5	130	IV	Designing - -	3	130	V
Designing - -	3	130	V	Hydraulics - -	5	126	IX
Thesis - - - -				Thesis - - -			

SHORT PROGRAM FOR APPLIED ELECTRICITY.

Students who do not wish to take the languages and higher mathematics required in the regular four-year program should take up the Short program, which may be completed in two years. The studies are arranged to give an accurate knowledge of the fundamental theories of electricity and magnetism, as well as a certain amount of skill in handling electrical machinery and appliances. Algebra, geometry, trigonometry, and elementary physics are included, for they are necessary in order to carry on successfully the practical work of designing, manufacturing and testing or operating electrical apparatus. Training in this practical work is given in the drafting room, the machine shops, and in the electrical and physical laboratories.

The actual conditions of the commercial application of electricity to the distribution of light and power are learned by testing, repairing and making additions to the University plant and by visiting the numerous electric establishments in the vicinity, accompanied by an instructor.

The study of the principles of mechanical drawing is taken up early in the program and sufficient practice is given to enable the student to make working drawings and to follow them in the construction of apparatus in the shops and laboratories.

Applicants for admission to the Short program should be at least 17 years of age. They should have a fair knowledge of the subjects taught in the common schools, especially arithmetic and algebra, as far as quadratics. They shall also write a short essay which must be satis-

factory in spelling, punctuation, sentence and paragraph structure.

When the required studies have been satisfactorily completed, a certificate stating that fact is issued.

The laboratory fees for students who are taking the regular work in the program, according to the following schedule, after they have finished all the work required for entrance, shall be as given on page 55.

All others are special students and for them the fee is as given on page 34, for Applied Electricity.

Studies Prescribed for the Short Program in Applied Electricity.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION		SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION	
		Page	Course			Page	Course
Algebra - - - -	5	179	C	Geometry - - -	5	179	D
Drawing - - -	2	153	I	Drawing - - -	2	153	II
Shopwork - -	3	130	XIV a	Shopwork - -	3	131	XIV b
Physics - - - -	5	137	I	Physics - - - -	5	137	I
Applied Electricity -	5	128	I	Applied Electricity -	5	129	I

SECOND YEAR.

Trigonometry	5	180	H	Engines and Boilers - - -	3	126	X
Designing - -	3	130	V	Designing - -	3	130	V
Shopwork - -	3	131	XIV c	Shopwork - -	3	131	XIV d
Dynamo Machinery -	5	129	III	Dynamo Machinery -	5	129	III
Applied Electricity -	5	129	II	Applied Electricity -	5	129	II

College of Architecture

THE COLLEGE OF ARCHITECTURE

Architecture is, fundamentally, a fine art; but it is a fine art that can be expressed on so large a scale that a deep and comprehensive knowledge of engineering science is necessary to make its expression stable.

The Master-Architect is the heaven-gifted man who, having conceived his projects in ultimate beauty of form, color, texture, and ornament, can build them structurally and economically perfect. It is seldom that any mind combines all of these attributes. It is more seldom that to-day's practice requires them in any one man. To-day, one man "designs"; another "frames."

It is the recognition of these two almost independent phases of Architecture that has caused the University of Notre Dame to detach the Programs in Architecture from the College of Engineering and to create the new College of Architecture.

The Faculty of the College now offer three undergraduate programs and two graduate programs to men able to furnish the entrance requirements. The Beaux-Arts program requires four years for completion and is offered to students wishing to specialize in design; the degree of Bachelor of Science in Architecture is given at completion. The Engineering program is of the same length and is offered to men wishing to specialize in construction; the degree is Bachelor of Science in Architectural Engineering. Graduate courses are offered after the reception of either degree, and, upon completion, a Master's degree is conferred. A Short program covering two years is offered to students finding it impossible or inexpedient to devote to college work the time required for completing the programs leading to degrees. Upon com-

pletion of the Short program a certificate of proficiency in architecture is given.

The general scheme of the programs provides for work in the draughting-room continuously during the morning hours from 8 to 12, and for recitation periods of class-room work in the afternoon. In the Senior years and in the Short program the recitation requirements are less and the time to be spent in the draughting-room correspondingly lengthened.

Students matriculating for the Short program or either of the four-year programs must be at least eighteen years of age and must have completed the studies preparatory to Architecture either in the Preparatory Department of the University or in another accredited school; or, entrance may be by examination, at the University on the first two days of the fall term.

Students may not matriculate with more than one condition; and any condition interfering with the routine of the programs must be worked off privately.

For students matriculating with advanced standing there must be a corresponding increase in the age limit.

Students taking the work of either of the graduate years must have received their Bachelor degree in Architecture or in Architectural Engineering from Notre Dame or another College of Architecture of equal standing. The University will confer the Master's degree on her own graduate students not in residence at the end of one year if that time is spent in an *atelier* of the first order or in travel abroad following an approved curriculum of study and investigation; or at the end of not less than two years if that time is spent in practice and if the requirements of the University are complied with.

The equipment of the College of Architecture, from a small beginning, is rapidly becoming more and more complete. There are a number of signed drawings—

some from the *Ecole de Beaux-Arts*, others from architects of national reputation; photographs, engravings, plaster models, reference books and manufacturers' catalogues and samples. The collection, however, needs to be increased faster than the resources of the University will permit. Philanthropic friends of Notre Dame can not give money or its equivalent for a better purpose. The endowment of a Travelling Fellowship, preferably for the study of European Ecclesiastical Architecture, will be a benefaction of the utmost practical value. One thousand dollars will provide for one man for one year.

EXPENSES.

In addition to the regular fees for matriculation, tuition, and board and lodging, as given on page 33, students in the Courses in Architecture are required to pay a laboratory fee of ten dollars.

ENTRANCE REQUIREMENTS.

Candidates for the Freshman Year in either of the four-year programs or for the first year of the Short Program must be prepared to pass an examination in the branches named below, unless they have done their preparatory work at Notre Dame or at an accredited High School.

English—Part of the examination is given for answering questions upon books required to be read in the preparatory courses in English, the remainder for writing an essay.

Algebra—Fundamental operations, simple equations, involution and evolution, radicals, radical equations and quadratic equations, including everything up to logarithms, as given in *Wentworth's* College Algebra, or an equivalent in the larger treatises by other authors.

Geometry — Plane and solid, including the solution of simple original problems and numerical examples, as given in the works of *Wentworth*, *Chauvenet*, *Newcomb*, or an equivalent in treatises by other authors.

Trigonometry — Plane and Spherical.

History—A general knowledge of the outlines of Greek and Roman History and of Medieval and Modern History.

Geography — Physical, as much as is contained in *Tarr's* or other text-books.

Physiology—*Martin's* Human Body, or an equivalent.

Botany — Elementary.

Zoology — Elementary.

Chemistry — Elements of inorganic chemistry. Laboratory work required.

Physics — Elementary. The preparation on this subject should include a course of lectures illustrated by experiments, and recitations from a text-book similar to *Carhart and Chute's* or *Gage's*. Laboratory work is recommended, but is not required.

Astronomy — Descriptive.

Civics — The American Constitution; the Federal and the State government.

German—Two years of German are required. Ability to translate at sight easy German into English, and easy English sentences into German.

French — An equivalent course in French may be offered for German.

Drawing — A knowledge of the use of drawing instruments, of elementary projection drawing and freehand.

THE BEAUX-ARTS PROGRAM.

DEGREES : Bachelor of Science in Architecture
Master of Science in Architecture.

It has been the aim of the College in offering this program so to design it that the student will have upon completion a general liberal education, a practical working knowledge of Construction, and a systematic and thorough training in Architectural Design and Composition. It may be undertaken by students whose artistic intuition and temperament fit them especially for the aesthetic side of the architectural profession.

The program is built up around the work in the draughting-room and *atelier*, where half of the student's time is spent. The work in Design, beginning in the Freshman year with the intelligent study of the Orders and simple problems involving their combination and use, and continued in the three following years by means of minor and major problems involving the planning of all classes of buildings from the simplest to the most monumental, is supplemented and rounded out by exercises in the various methods and media of rendering and by a thorough course in freehand drawing and modelling. All instruction in planning and composing is based on correct principles of design.

The materials and methods of all trades and professions engaged in building operations are systematically studied in the Construction classes throughout the four years of the program. The writing of specifications for each branch of labor is studied synchronously. Practical work in the various trades is given that the student may know good work and thus be able to superintend construction intelligently. These practical lessons are supplemented

by weekly inspection trips to the important building operations and industries in the neighborhood of the University.

The standard hand-books and mill-books are used as supplementary text-books.

Graphic methods of determining stresses in beams, girders, and trusses of all forms are studied and numerous practical problems solved.

Working drawings and details of construction are made under office conditions.

Broadly speaking, it is the purpose of the College in outlining the Construction courses to equip the student to solve by *office methods* any problem he may meet in ordinary practice, it being taken for granted that graver problems requiring a deep knowledge of the higher mathematics may well be left to the Architectural Engineer.

In the last year of the program a series of lectures are given on Estimates, Contracts, Law, Business Relations, and Professional Ethics and Practice. Architects of high professional standing will give a number of the lectures in this course.

The History of Architecture and of the allied Arts is studied in a course covering three years. The method is a combination of lectures, recitations, and research.

In the Graduate year advanced work in criticism and research is done and larger and more complicated problems are given in Design.

THE ENGINEERING PROGRAM.

DEGREES: Bachelor of Science in Architectural Engineering
Master of Science in Architectural Engineering.

The science of Engineering has long since outgrown the practical limits of one man's abilities. To be thorough, the Engineer must specialize. One of his

specializations is in Architecture. His services are needed to frame important buildings, to design their foundations and to protect adjoining property while they are in erection. The modern idea of education is to progress in a course parallel to the world's needs. The College offers the Program in Architectural Engineering because there is need of the services of the men who can complete it.

Students desiring to become Architectural Engineers should have a bent for Mathematics and for painstaking exact draughting.

The program of studies differ from that of the Beaux-Arts program chiefly in that a course in pure and applied Mathematics is substituted for the courses in English, Economics and Philosophy; a year in History of Construction for the one in History of Art; and in that a relatively greater amount of time, increasing each year, is spent in Construction Design.

Graduate work is spent entirely in solving problems of the first order in Architectural Engineering.

THE SHORT PROGRAM.

The Short program in Architecture comprises most of the work that is in the larger programs essentially architectural. A glance at the schedule will show that there is relatively fewer recitations and correspondingly more hours in Design each year than in either of the complete programs.

SUMMER WORK.

Summer, or Vacation Work, consisting of sketches, projects, measured drawings or work in an Architect's office will be required of all students of Architecture.

Beaux-Arts Program.

FRESHMAN YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
English	3	101	I	English	3	101	I
Hist. of Arch.	2	133	IX	Hist. of Arch.	2	133	X
Des. Geom.	3	153	III	Shades and Shadows Perspective	3	153	III
Construction	2	131	I	Construction	2	131	I
Freehand	2	157	I	Freehand	2	157	I
El. of Arch.	8	134	XV	El. of Arch.	8	134	XV

SOPHOMORE YEAR.

English	3	102	II	English	3	102	II
Construction	2	131	II	Construction	2	131	II
Physics	3	138	II	Graphics	3	122	XV
Hist. of Arch.	2	133	XI	Hist. of Arch.	2	134	XII
Freehand	2	157	I	Freehand Modelling	2	157 158	I, III
Pen-and-Ink	1	155	XIII	Water Color	1	155	XI
Design	7	135	XVI	Design	7	135	XVI

JUNIOR YEAR.

Economics	4	110	I	Adv. Cons't'n	4	132	III
Adv. Cons.	4	132	III	Heat. & Vent.	2	133	VI
Sanitation	2	132	V	Electricity	1	128	I
				Theory Design	1	135	XIX
Freehand	2	157	II	Freehand. Modelling	4	157 158	II, III
Design	8	135	XVII	Design	8	135	XVII

SENIOR YEAR.

Ethics	4	95	III	Sociology	4	111	VIII
				Busiuess Relations and Professional Ethics	2	133	VII
History of Art	2	134	XIII	History of Art	1	134	XIII
Freehand	2	158	III	Freehand	2	158	III
Design	12	135	XVIII	Thesis Design	11	135	XVIII

Engineering Program.

FRESHMAN YEAR.

SUBJECTS: FIRST TERM.	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS: SECOND TERM.	Hrs. a Week	SEE EOR DESCRIPTION Page	Cours
Algebra - -	5	113	I.	Anal. Geom.	5	114	II.
Des. Geom. -	3	153	III.	Shades Sh'd'ws } Perspective }	3	153	III.
Construction	2	131	I.	Construction	2	131	I.
Freehand - -	2	157	I.	Freehand - -	2	157	I.
El. of Arch. -	8	134	XV.	El. of Arch. -	8	134	XV.

SOPHOMORE YEAR.

Calculus - -	5	114	III.	Calculus - -	5	115	IV. V.
Construction	2	131	II.	Construction	2	131	II.
Physics - - -	3	138	II.	Graphics - -	3	122	XV.
Freehand - -	2	157	I.	Freehand -	2	157	I.
Pen-and-Ink	1	155	XIII	Water Color	1	155	XI
Design - -	7	135	XVI.	Design - -	7	135	XVI.

JUNIOR YEAR.

Anal. Mech. -	5	118	VIII.	Analyt Mech	2	118	VIII.
Adv. Cons. -	2	132	III.	Mech's of Mat.	3	119	X.
Sanitation -	2	132	V.	Adv. Cons. -	2	132	III.
Hist. of Arch.	2	133	IX.	Heat. & Vent.	2	133	VI.
Freehand -	1	157	II.	Electricity -	1	128	I.
Design - -	8	135	XVII.	Hist. of Arch.	2	133	X.
				Design - -	8	135	XVII.

SENIOR YEAR.

Architectural Engineering	5	132	IV.	rchitectural Engineering	5	132	IV.
Hist. of Arch.	2	133	XI.	Business R'l't'n } Profess'l Ethics }	2	133	VII.
Freehand - -	1	158	III.	Hist. of Arch.	2	133	xII.
Structural Design - -	12	135	XVIII.	Design–Thesis	11	135	XVIII.

Short Program in Architecture.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
Descriptive Geometry	3	153	III	Shades and Shadows	3	153	III
Construction	2	131	I	Perspective			
History of Architecture	2	133	XI	Construction	2	131	I
Freehand	2	157	I	History of Architecture	2	133	XI
				Freehand Modelling	2	157 158	I, III
Elements of Architecture	11	134	XV	El. of Arch. Design	11	134 135	XV XVI

SECOND YEAR.

Construction	2	131	II	Construction	2	131	II
Sanitation	2	132	V	Heating and Ventilation	2	133	VI
History of Architecture	2	133	XI	Graph. Statics	3	122	XV
Physics	3	138	II	Electricity	1	128	I
Freehand	4	157	II	Theory Design	1		
Pen-and-Ink	1	155	XIII	Freehand	2	157	II
Design	6	135	XVII	Water Color	1	155	XI
				Design	8	135	XVII

College of Law

THE COLLEGE OF LAW.

For several years a systematic movement has been in progress under the auspices of the bench and bar of the country to elevate the standing and promote the efficiency of the legal profession, and make it as learned in fact as it is in name. The most essential preliminary step to this end, as lawyers generally agree, is to prescribe requirements and examinations more comprehensive and rigorous as a test of qualifications for admission to the bar. Under the influence largely of the American Bar Association, the period now commonly prescribed for the study of law in a college is three years.

A period of three years study is prescribed for undergraduates in the College of Law of the University of Notre Dame. It leads when satisfactorily completed to the degree Bachelor of Laws. The Graduate course comprises an additional or fourth year, and leads to the degree of Master of Laws.

On account of the peculiarly favorable location of the University for diligent and persevering work, it is possible for industrious students to do at least a fourth more in the year than is elsewhere attempted.

The undergraduate law students are divided into three classes, corresponding to each year of the program leading to the degree of Bachelor of Laws. The Graduate course is for students who have received that degree and aim at attaining, by further study and practical work, to a higher grade of proficiency. A full year of study in each class is obligatory. Moreover, the student must pass a satisfactory general examination at the close of each scholastic year. Graduates entitled to vote are admitted to the bar on motion of the Supreme Court of Indiana.

Candidates for degrees in the College of Law are admitted to the first year on presentation of a certificate of graduation from some High School accredited to the State Universities or by examination on subjects scheduled in any of the programs of the preparatory school at Notre Dame. Certificates showing that the candidate has completed subjects required in any of the four year programs of the preparatory school at Notre Dame or of any other reputable preparatory school giving equivalent courses, will be accepted in lieu of examinations.

Students from other reputable law schools are received at any time and allowed due credit for the work previously done. They must, however, be in residence for at least one year in order to be entitled to degrees.

Lawyers who have been engaged in the practice of the profession or have only been admitted to the bar, as the case may be, are admitted to the Senior class and entitled to the degrees appropriate to their work and standing at graduation in the following June.

SPECIAL STUDENTS.

Students who do not intend to become candidates for the degree of Bachelor of Laws, but wish simply to add to their educational acquirements a knowledge of the fundamental principles of law, may at any time in the year have their names enrolled on the list of special students. No extra expense is thereby incurred. Yet they must be sufficiently advanced in age and education to justify the belief that they can understand and appreciate instruction in the law. No particular academic entry requirement is prescribed for them, aside from securing the consent of the Director of Studies and being of sufficient age and capacity to understand and profit by instruction in the law. The number of such stu-

dents is likely to increase steadily, for year by year it is becoming more manifest that an education is not complete without a knowledge of at least the elementary legal principles. Many a person has been forced to do exactly the contrary of what he intended through his failure to understand the essential elements of a contract. Many a one has been compelled to pay heavy damages for personal injuries caused by negligence, or failure to perform a duty, or improper performance of it, where no liability would exist if the law of torts had been known and observed.

METHODS OF INSTRUCTION.

The study of cases is usually begun in September and continues long enough to enable students to understand, analyze and criticise the decisions assigned to them for study and recitation. Lectures and explanations supplement this work. After thus familiarizing themselves with cases, they are expected to read the authorities cited daily in class, whether in the text-books, lectures or quizzes. In the preparation also of written theses from month to month, comprising on an average fifteen pages of legal cap, they must necessarily consult and cite them. In moot-court work, likewise, they are prepared for actual practice by making a careful study not only of the cases in the reports, but also of those cited in text-books and digests.

In examinations for admission to the bar the courts of some States require applicants to furnish lists of the text-books they studied, and such as have merely attended lectures or studied cases, instead of reading text-books, encounter danger of being declared ineligible to appear for examination. As many law students come from States in which this test is applied, the use of text-books is deemed necessary. The books used by

students become peculiarly serviceable in their subsequent practice. They may be purchased in the Students' Office at the lowest retail prices. The cost may be estimated at $20 or $25 a year.

The lecture or dictation system alone is regarded at Notre Dame as impracticable but, in combination with text-book work, case readings and daily examinations, its great value and utility cannot be overestimated. Each subject is fully covered by lectures, text-book work, weekly quiz, monthly thesis, bi-monthly examinations, the reading of pertinent cases and formal trials in the moot and other courts of the College.

This course of instruction is comprehensive, thorough and practical. The earnest and industrious student can accomplish twice as much in a given time at Notre Dame as he can in an office or at home. With comparative immunity from the distractions and temptations of city life, he can give his entire time to study and necessary recreation. In short, he can here study a greater number of hours and do more class work day by day than probably anywhere else in the entire country.

Students have from three to four recitations daily based upon the text-books, the books of selected cases, the questions answered in writing or the subjects dealt with in the lectures. From one to two hours additional must be devoted daily to office and library work, while four hours weekly are required for moot-court practice and exercises of the law debating society. While this society and the moot-court offer exceptional opportunity and strong incentive to acquire readiness in debate, fluency in speech and force in forensic oratory, yet much benefit may be derived from attending the regular classes in elocution and oratory in the College of Arts and Letters.

When a subject is regularly begun in the Law Program

it is studied and kept before the class, with recitations day by day at the same hour, until finished. It is believed that in this way the mind follows it more closely and that it is better understood than it would be if frequently interrupted by the intervention of other and dissimilar subjects.

THE MOOT COURTS.

All students are required to attend and participate in the exercises of the moot-court. Students of the first year are expected to serve on juries and as witnesses, while those of the second year assist the Seniors and Graduates in the conduct of trials. The court is fully organized, having a judge, clerk, state's attorney, sheriff, coroner and reporter. Pleadings are filed in the clerk's office, served and returned by the sheriff, brought to an issue with due formality by the attorneys, and the trial proceeds under the rules of evidence before a member of the Faculty, acting as judge.

In addition to the moot-court, which corresponds to the ordinary circuit or trial court, there is a fully equipped court of equity, with its chancellor, clerk, master-in-chancery, bailiff and reporter.

There is likewise a justice's court. This comprises the justice of the peace, clerk and constable.

The Federal judicial system is also represented. The United States District Court, for example, has its district judge, clerk, district attorney, marshal and reporter.

The course of procedure in these courts follows as closely as practicable the actual procedure in the courts they represent. Practice is combined with theory in their work. The statement of facts in the cases to be tried are furnished by the Faculty. Students acquire in this way a knowledge of the customary procedure in the regular courts.

THE LAW LIBRARY.

There are undoubtedly in the country several law school libraries considerably larger than the library at Notre Dame, but it may well be questioned whether any of them shows more care in the choice of books, or is better adapted for the use of students. All the latest reports of State and Federal courts are on its shelves, and no difficulty is experienced at any time in finding the cases needed for reference, thesis writing and moot-court work. A great library, with a crowdingly large attendance of students—too many to be personally known by or have personal attention from the Faculty—may often be less available for use or accessible than a comparatively small one. It happens sometimes in such cases that twenty or more students are found vainly scrambling at the same time to secure possession of a particular report or text-book. Such experience fortunately does not fall to the lot of the young men studying at Notre Dame. Not only all the latest reports, but likewise the leading text-books, are to be found on the library shelves.

The books may be read in the library or used in moot-court trials, but must not be carried to private rooms, nor hidden in desks. This rule is rigidly enforced by the librarian. It is intended for the advantage and to facilitate the work of the students in common, tor all have a right to feel reasonably certain that when a book is needed it can be found in the library.

The books on the shelves of the Law library number 3,500, but so carefully have they been selected that they may be said to surpass in practical utility many libraries twice as large. The library adjoins the law lecture room. It is open practically all day and until 9:30 o'clock at night. The light and ventilation

are excellent, and students find it a very wholesome and comfortable place in which to study.

In addition to the law library, the general library of the University is open, likewise, at all reasonable hours to law students. The library privileges are on a generous scale, and students are not specially charged for making proper use of the books, although otherwise if a book be lost or injured through negligence.

THE LAW DEBATING SOCIETY

holds its meetings on Wednesday evenings. All students of the College are members of it. They are required, each in his turn, to participate in its debates and other exercises. The debates commonly deal with questions germane to the law, but subjects of history, political economy, and the like, are also discussed. An excellent opportunity is afforded at the meetings of the society to develop skill, power and fluency in public speaking. One of the professors usually presides and aids the members with his counsel aud suggestions. A Parliamentary Law meeting, with exercises in elocution and debating, takes place each Wednesday afternoon.

For expenses for tuition, board, lodging, etc., see pages 33, 34.

LAW PROGRAM.

FIRST YEAR	SECOND YEAR	THIRD YEAR	GRADUATE YEAR
TEXT-BOOKS: Kent's Commentaries (Abridged) Reed's Rules of Order, or Waples' Parliamentary Law, Natural Law and Legal Ethics.	*TEXT-BOOK: Blackstone's Commentaries (Abridged).*	*TEXT-BOOK: Robinson's Elements of American Jurisprudence*	The State and Federal Courts and their Respective Functions. The Roman Law. The Law of Admiralty. Mines, Mining and Water Rights. Copyright, Patents and Trademarks. Trusts and Trustees. Interpretation and Construction of Statutes. Statutes of State and Federal Statutes. Powers and Functions of Masters in Chancery, Referees, Sheriffs, Coroners, Justices of the Peace, United States Commissioners, Arbitrators, and Receivers,
Persons and Domestic Relations. Contracts. Torts, or Private Wrongs. Criminal Law, or Public Wrongs. Property, Real and Personal. Forensic Medicine, or Medical Jurisprudence and Toxicology.	Criminal Procedure. Corporations, — Private and Public, or Municipal. Partnership. Agency. Sales. Bailments and Carriers. Insurance, — Fire, Life, Accident, Marine. Common Law Pleading and Practice.	Equity Pleading and Practice. Code Pleading. Evidence. Damages. Bills, Notes and Checks. Suretyship and Guaranty. Equity Jurisprudence. Wills, Executors and Administrators. Constitutional Law. International Law.	

Courses of Instruction

COURSES IN PHILOSOPHY.

I.

(*a*) **Physiological Psychology**—This course is a fairly comprehensive treatment of the physical basis of consciousness.

(*b*) **Experimental and Descriptive Psychology**—The primary laws of consciousness.

(*c*) **Rational Psychology**—The problems of the mind. Nature, origin and destiny of the soul.

[Courses *a*, *b*, and *c* are consecutive. Lectures three hours a week for two terms.*]

(*d*) **Laboratory Exercises**—Experiments will be conducted with special reference to their value as aids to introspection. Sandford's *Course in Experimental Psychology.*

[One hour a week for two terms.]

II.

(*a*) **Elements of Epistemology**—A study of the Scholastic theory of knowledge in relation to the teachings of Descartes, Leibnitz, Locke, Berkeley, Hume, Kant and Spencer.

(This course is intended to be introductory to Logic and General Metaphysics and will be given at the beginning of the year during the time prescribed for these studies.)

(*b*) **Logic**—Hyslop's *Elements of Logic.*

[Two hours a week for two terms.]

(*c*) **General Metaphysics**—Transcendental concepts: their value in different systems of Philosophy.

[Two hours a week for one term.]

* In the description of courses in all the Colleges a "term" means four and one-half months.

(*d*) **Cosmology**—The fundamental concepts of the natural sciences in relation to Thomistic philosophy.

[One hour a week for one term.]

(*e*) **Theodicy**—The existence of God; His attributes; His presence in the universe.

[One hour a week for one term.]

(*f*) **Student Discussions**—From time to time throughout the year students will be required to read and discuss papers on various subjects in the field of philosophic inquiry.

III.

(*a*) **Ethics**—The theory of Morals, with special reference to practical problems.

[Four hours a week for one term.]

(*b*) **Outlines of the History of Philosophy**—Turner's *History of Philosophy.*

[Four hours a week for one term.]

IV.

Graduate Work in Philosophy—Graduate work in the department of Philosophy, leading to the degree of Master or Doctor, may be undertaken by students who have pursued the courses described above. Candidates who have made undergraduate studies elsewhere must give evidence of ability to begin specializing at once. In the first and second years, research work will be conducted in the seminar and the psychological laboratory. In the last year, students will have the benefit of frequent consultation with the professors.

COURSES IN GREEK.

I.

Lysias — Orations selected. Short history of the Attic orators.

Homer — Odyssey.

Prose Composition based on Lysias.

Epitome of the New Testament: Parts IV., V. *Stoffel.*

[Four hours a week for one term.)

II.

Lysias — Orations selected.

Homer — Odyssey.

Prose Composition based on Lysias.

St. John Chrysostom — Eutropius.

[Four hours a week for one term.]

III.

Herodotus — Selections. Study of Herodotus dialect.

Advanced Greek Prose Composition.

St. Basil — De Profanis Scriptoribus.

[Four hours a week for one term.]

IV.

Herodotus — Selections.

Selections from the Greek Lyric Poets.

Advanced Greek Prose Composition.

St. Gregory — Machabees.

[Four hours a week for one term.]

V.

Demosthenes — The Speech on the Crown, or the Olynthiacs and the Philippics. Review of the political situation at Athens and events bearing upon the orations.

Thucydides — Book I. Greece before the Peloponnesian War. Importance of this war in Greek history.

The speeches will form the subjects for special class interpretations. Stylistic differences between pure Attic and archaic Attic will be pointed out.

During this course special attention will be given to textual and exegetical criticism, practically shown by passages selected for that purpose. This is done in the belief that it is the best way to make students appreciate the notes in school editions of classical authors.

Practical Exercises—Embodying idiomatic expressions of the authors read.

[Four hours a week for one term.]

VI.

Aeschylus—One play to vary each year. In connection with it will be discussed the origin of the drama, the part of the chorus in the early tragedy and the religious tenet of Aeschylus. The structure of a Greek tragedy, the iambic trimeter and the lyric meters will be sufficiently explained so as to be properly appreciated by the students. Incidentally also the Greek festivals, at which the plays were staged, and the Dionysiac theater will be discussed.

Sophocles—Oedipus Tyrannus and Antigone. Digest of the Theban legends. Religious views of Sophocles compared with those of Aeschylus.

Elements of Greek Literature—Students shall use Jebb's *Primer of Greek Literature.*

[Four hours a week for one term.]

VII.

Euripides—One play, to vary each year. Religious tendencies of Euripides. His style as compared with that of Aeschylus and Sophocles. His dramatic art, and his right to the title of "Scenic Philosopher."

Aristophanes—One play, selected from the following list: The Acharnians, the Knights, the Frogs, the Clouds, the Birds, or the Wasps. In connection with the reading of these plays will be treated the Greek Comedy,—its origin, nature, and aim. Aristophanes, the great burlesque critic of Athenian life and manners. The structure of a comedy compared with that of a tragedy.

Practical Exercises in Greek Composition.

[Four hours a week for one term.]

VIII.

Pindar—Selected Odes, in connection with which the public games will be studied. *Elective.*

Greek Fathers—St. Basil—The Martyr Gordius. St. John Chrysostom—The Return of Bishop Flavian. St. Gregory Nazianzen—Funeral Oration of Caesarius. *Elective.*

Plato—Apology and Crito. Socrates,—his friends and enemies. Athenian court-proceedings.

[Four hours a week for one term.]

IX.

Graduate Work in Greek—Advanced courses of instruction in the Greek language and literature will be provided for graduate students who look forward to the Master's or Doctor's degree. The center of work will be the Greek Seminar, devoted to the interpretation of passages selected for that purpose by the Director of the Seminar, and to a critical study of one particular author or of a group of authors in the same department of Greek literature; as, for instance, Homer, Plato, or the Orators, the Historians, the Dramatists, etc.

The work of the Seminar will be supplemented by lectures on the history of Comparative Philology, on Comparative Grammar, and on the Greek dialects.

For those who desire a broader basis for their linguistic studies, an elementary course in Sanskrit will be offered.

COURSES IN LATIN.

I.

Livy — Book XXI. Study of Livy's grammar and style.

Cicero — Epistles selected.

Prose Composition.

[Four hours a week for one term.]

II.

Livy — Book XXII.

Cicero — De Senectute and De Amicitia.

Pliny — Epistles selected.

Prose Composition. Writing of continuous prose.

[Four hours a week for one term.]

III.

Cicero — De Oratore. Book I.

Horace—Odes and Epodes. Study of Metrical Systems; Peculiarities of Style; Plan of Composition; Comparison with Odes of a similar nature.

Advanced Latin Prose Composition.

[Four hours a week for one term.]

IV.

Tacitus — Dialogus De Oratoribus.

Horace — Odes and Epodes; or, Satires selected. See Course III.

Terence—Phormio. Short history of Greek and Roman comedy.

Advanced Latin Prose Composition.

[Four hours a week for one term.]

V.

Livy — Roman History, First Book. In the reading of the text particular attention is called to the rules of

syntax—roots and derivation of words—and the ancient history, geography and mythology.

Latin Composition twice a week, either paraphrases or original. Short fables and stories.

Horace—Epistula ad Pisones translated, analyzed and criticised from a philological and literary standpoint.

Ancient Literature—Historians and Lyric Poets: their lives, their works, their genius.

[Four hours a week for one term.]

VI.

Tacitus—Agricola and Germania. While reading the text a comparison is made with the private and public manners of modern nations.

Terence—Andria. Sight reading.

Horace—The Literary Epistles.

Weekly practice in written Composition, Latin Conversation and Versification.

Ancient Literature—Dramatists of Greece and Rome compared and discussed.

[Four hours a week for one term.]

VII.

Quintilian—De Institutione Oratoria, Books Tenth and Twelfth. Translation. The explanation embraces a literary criticism of Grecian and Roman Orators, and practical remarks on Latin idioms and the fine arts of Antiquity.

Short Orations or Dissertations, and practical Conversations take place weekly.

Plautus—Captivi. The study of the play gives a full knowledge of the characters, the plot, and the style, the archaic forms, and the construction peculiar to the author.

Ancient Literature—Orators, especially Demosthenes and Cicero.

[Four hours a week for one term.]

VIII.

Cicero—De Officiis. Partly sight reading. Besides the study of the work from a philological standpoint, the student is made acquainted with the main systems of Grecian Philosophy, and continual reference is made to Course III. in Philosophy.

Oratorical and Philosophical Compositions alternate weekly. Latin Conversation on general topics.

Lucretius—De Rerum Natura. Select passages. Synopsis of the poem. Statement and refutation of erroneous philosophical systems of antiquity. Analogy with the errors of our day. Style of the writer.

Ancient Literature—Philosophers, particularly Socrates, Plato and Aristotle, Cicero and Seneca.

[Four hours a week for one term.]

IX.

Graduate Work in Latin—Advanced courses of instruction in the Latin language and literature will be provided for graduate students who are candidates for the degree of Master or Doctor. The work will be directed in the Seminar and be devoted to a critical study of one particular author or group of authors.

The work of the Seminar will be supplemented by lectures on Comparative Philology and Comparative Grammar.

COURSES IN ENGLISH.

I.

(*a*) **Prose Forms**—Special treatment of Exposition and Argumentation. Genung's *Working Principles of Rhetoric*, Part II.

[Two hours a week for one term.]

(*b*) Heydrick's *How to Study Literature*, with practical exercises in analysis of literary forms.

[One hour a week for one term.]

(*c*) **Literature**—*Higginson and Boynton's.* In this course the student acquires a good knowledge of the contents of American literature. The Biography of men of letters is also a part of this course.

[One hour a week for two terms.]

(*d*) **Lyric Poetry**—The technique is carefully laid down and choice specimens of lyric poetry are read critically in class. There is much required reading.

[One hour a week for one term.]

II.

(*a*) **Prose Forms**—Special Study of the Novel and the Short Story. The development of the novel is carefully studied, and its kinship with other forms of narrative is pointed out.

[Two hours a week for one term.]

(*b*) **Literature**—The Development of English Literature is studied, minute attention being given to great periods.

[Two hours a week for one term.]

(*c*) **The Sonnet**—Technique and analysis of famous sonnets.

[One hour a week for two terms.]

III.

(*a*) **Prose Forms**—Intensive study of the Essay and the Oration. Each student in this course is required to read the great essays and orations in English literature. He must produce four essays and two orations during the term.

[Two hours a week for one term.]

(*b*) **Literature**—Recent English and American Poetry. This course deals not only with the best work done in recent volumes of collected verse, but also takes account of the best fugitive pieces in the magazines.

[Two hours a week for one term.]

(*c*) **Didactic Poetry and Satire**—This course involves reading chiefly.

[One hour a week for two terms.]

IV.

(*a*) **The Laws of the Epic and the Drama**—Ker's treatise on the Epic with required readings in narrative poetry. Freytag's *Technique of the Drama*, with supplementary notes.

[Two hours a week for one term.]

(*b*) **Shakespeare**—Reading and Analysis of Plays.

[Two hours a week for one term.]

(*c*) **The Leading Poets of the Nineteenth Century**—Analytical study and required reading.

[One hour a week for two terms.]

V.

Graduate Work in English—Students wishing to do advanced work in English will be provided with library facilities and led through the usual work for the degree of Master of Letters or Doctor of Philosophy.

The major subject on approval of the Faculty of English may be any special aspect of a literary form or epoch, or a comparative study of related authors.

Seminar work, the study of texts, and special lectures by the professors make up the course.

COURSES IN GERMAN.

I.

Grammar, *Joynes-Meissner*, Part I. Translation from German into English of simple prose; translation of English exercises into German. Reading of short stories and selections from more difficult prose.

German Reader, *Miller and Wenkelbach*.

[Five hours a week for two terms.]

II.

Grammar, *Joynes-Meissner*, Part II. Translation into German of narrative prose and selections from history. Sight reading of selections from history.

Herman and Dorethea (*Goethe*); Lichtenstein (*Hauff*).

[Three hours a week for two terms.]

III.

Grammar, *Joynes-Meissner*, Part III. Sight reading of plays, poems and prose writings. Translations of selections from history and literature; original essays.

Minna von Barnhelm (*Lessing*); Best known poems, (*Heine*); Correspondence (*Schiller-Goethe*).

[Two hours a week for two terms.]

COURSES IN ROMANCE LANGUAGES.

These Courses include the study of French, Spanish, Italian, Portuguese, Old French, Provencal.

The principal aim is to impart an accurate reading knowledge of literary works written in these languages. In the study, however, of Old French and Provencal special attention will be paid to Philosophy.

(*a*)

COURSES IN FRENCH.

I.

Grammar with written and oral exercises; the inflection of nouns and adjectives, the use of all the pronouns, the conjugation of regular and the common irregular verbs; the correct use of moods and tenses, the essentials of French syntax, and the common idiomatic phrases. Reading three of the following works: French by Reading, (*Houghton*). La Tâche du Petit Pierre, (*Mairet*). Un Cas de Conscience, (*Gervais*). La Main Malheureuse, (*Guerber*). Sans Famille, (*Malot*). .Readings from French history, (*Super*).

[Five hours a week for two terms.]

II.

Advanced grammar with composition, study of idioms, memorizing. Dictations and conversations on practical topics, and careful reading of three or four of the following works: Le Voyage de M. Perrichon, (*Labiche*). Roman d'un Jeune Homme Pauvre, (*Feuillet.*) Fables choisies, (*La Fontaine*). Le Médecin Malgré Lui, (*Molière*). Le Cid, (*Corneille*). Esther, (*Racine.*) Pages oubliées de (*Chateaubriand*). La Question d'Argent, (*Dumas*). Standard French Authors, (*Guerlac.*)

[Three hours a week for two terms.]

III.

The study in this course is devoted chiefly to the prose and poetry of the nineteenth century and includes composition, conversation, history and general view of French literature. Besides a translation and criticism of the best writers such as; Causeries du Lundi, (*Ste. Beuve*). On Rend l' Argent, (*Coppée*). Hernani, (*Hugo*). Méditations. (*Lamartine*). Athalie. (*Racine*). L'Avare,

(*Molière*). Mlle. de la Seiglière, (*Sandeau*). Les Origines de la France Contemporaine, (*Taine*). Expédition de Bonapart en Egypte, (*Thier*). Ste. Elisabeth de Hongrie, (*Montalembert.*) Histoire de la Littérature Française, (*Duval*).

[Two hours a week for two terms.]

N. B.—The works studied are not necessarily the same every year.

(*b*)

COURSES IN SPANISH.

I.

General outlines of grammar with composition. Translation of easy tales from *Trueba*, *Fernon Caballero*, *Perez Escritch*, etc., with select fables of *Samaniego*, and *Iriarte*.

[Four hours a week for two terms.]

II.

Spanish Prose and Poetry of the eighteenth and nineteenth centuries, with composition and the history of the Literature of the period.

[Four hours a week for two terms.]

III.

Literature of the sixteenth and seventeenth centuries: *Cervantes*, *Calderon*, *Lope de Vega*. History of the Literature of the period, with essays in Spanish.

[Four hours a week for two terms.]

IV.

Early Spanish. *El Poema del Cid*. History of the Literature of the fifteenth century.

[Two hours a week for two terms.]

(*c*)

COURSES IN ITALIAN.

A two-years' course. The chief work of the courses is a critical study of Dante's Divina Commedia. Readings from Tasso, Petrarca, Ariosto's Satires and Manzoni.

(*d*)

COURSES IN PORTUGUESE.

I.

Portuguese Conversation Grammar, (*Wall*). Readings: Perfil do marquez de Pombal, (*Camillo Castello Branco*). Novellas Historicas, (*Pinheiro Chagas*). Lendas e narrativas, (*Herculano*). Campo de flores, (*Joao de Deus*).

[Four hours a week for two terms.]

II.

Sermoes, (*Padre Antonio Vieira*). Os Lusiadas, (*Camoes*). History of Portuguese literature.

[Four hours a week for two terms.]

(*e*)

COURSES IN OLD FRENCH.

Special attention will be paid to the laws underlying the formation of the French language from the popular Latin. For this purpose a work like Brachet's *Grammaire Historique* will be studied. It is under this point of view that Old French authors will be read, especially *La Chanson de Roland.*

(*f*)

COURSES IN PROVENCAL.

Language and Literature, with reading from the works of the Troubadours.

COURSES IN HISTORY.

ANCIENT HISTORY.

I.

(*a*) **Ancient Greece** to the conquest by Rome of the Hellenic world. Readings, and examinations on required texts. This course is given in alternate years with Course I. (*b*)

[Four hours a week for two terms.]

(*b*) **Ancient Rome** to the Barbarian invasions. Readings, and examinations of required texts. This course is given in alternate years with Course I. (*a*)

In both courses, the student is required to become familiar with the institutions of the ancient world, and to study the same in De Coulanges' *The Ancient City*.

[Four hours a week for two terms.]

MEDIEVAL AND MODERN HISTORY.

II.

(*a*) **The History of the Middle Ages** from the invasion of the barbarians, and the history of the periods of the Renaissance and the Reformation of 1603. Readings, and examinations on required texts.

[Three hours a week for two terms.]

(*b*) **The General History of Europe** from the beginning of the seventeenth century to the present time. Readings, and examinations on required texts.

[Four hours a week for one term.]

III.

The History of the British Isles to the Revolution in 1689—For the narrative Gardiner's *Students' History* is used as a text and is supplemented by lectures.

In the study of the development of political institutions Feilden's *Constitutional History* is used. In addition students shall make free use of the library in preparing special topics upon which they shall report orally in class.

[Four hours a week for two terms.]

AMERICAN HISTORY.

IV.

(*a*) **American History from its beginning to 1763**—A large part of the work of this and the following course consists in the preparation and presentation in class of special topics by the students. An effort will be made to train the student in the use of original sources as well as in the discriminating use of secondary works. Weekly written tests are given upon the lectures and the assigned collateral reading.

[Four hours a week for one term.]

(*b*) **American History from 1763 to the Present Time**—Treatment as in (*a*) above. Also a book review, a bibliographical report and a bibliographical essay by each student.

[Three hours a week for two terms.]

V.

Research Work in History—Facilities are offered to graduate students who wish to do advanced work in History leading to the Master's or the Doctor's degree. Evidence to begin specializing must be given by candidates who have received their Bachelor's degree at another College. The work is directed in the Seminar and is supplemented by lectures.

COURSES IN POLITICAL SCIENCE.

(*a*)

ECONOMICS.

I.

The Elements of Economics. viz.:—Land, Human Exertions and Capital; Value, Money and Credit; Rent, Interest, Profit and Wages; Population and Consumption. The text-book used is Walker's *Manual of Political Economy.*

[Four hours a week for one term.]

II.

Industrial History and the history of Economic Thought. Readings, lectures and examinations on required texts.

[Four hours a week for one term.]

III.

Money, Credit and Banking, with special treatment of the monetary experiences of the United States. Lectures, readings, and examinations on required texts.

[Four hours a week for one term.]

IV.

Distribution—A course covering the Land and Labor Questions and Socialism. Lectures, readings, and examinations on required texts.

[Four hours a week for one term.]

(*b*)

POLITICS.

V.

The Elements of Politics—Lectures and examinations on required texts.

[Two hours a week for one term.]

VI.

The American Constitution and Political Institutions. Lectures, readings, and examinations on required texts.

[Two hours a week for one term.]

VII.

Jurisprudence—A course covering (a) the outlines of the Science of Law. (b) The elements of International Law,, and (c) Lectures on selected topics of Roman and Canon Law. Lectures, readings, and examinations on required texts.

[Two hours a week for two terms.]

(*c*)

SOCIAL SCIENCE.

VIII.

The Elements of Sociology—Lectures, readings, and examinations on required texts.

[Four hours a week for one term.]

IX.

Graduate Work in Political Science—Advanced courses in Economics, Politics and Sociology are provided for graduate students who wish to receive the degree of Master or Doctor.

COURSES IN ELOCUTION AND ORATORY.

I.

Readings and Declamations—This course is designed to correct defects in pronunciation and emphasis. Each student is required to give two declamations.

[One hour a week for one term.]

II.

Continuation of Course I.—Each student is required to give three declamations.

[One hour a week for one term.]

III.

Practical Elocution—Exercises in breathing, voice culture, and action. The principles of pronunciation and emphasis and their application in the reading of selections. Text-book, Fulton and Trueblood's *Practical Elocution.*

[One hour a week for one term.]

IV.

Continuation of Course III.—Further exercises in breathing, voice culture, action. Quality, Force, Pitch and Time. Minute speeches and declamations. Lectures on the principles of action. Text-book, Fulton and Trueblood's *Practical Elocution.*

[One hour a week for one term.]

V.

Oral Discussions—The application of Formal Logic to debating. Analysis of selected argumentative speeches, and the preparation of briefs. Courses III. and IV. and a course in Logic are required for admission to this course. Sections are limited to twenty-four students.

[One hour a week for one term.]

VI.

Shakesperian Reading—The critical and artistic reading of two of Shakespeare's plays accompanied with stage action. The students present the play by scenes before the class. Courses III. and IV. are required for admission to this course. Sections are limited to twenty-four

students. This course alternates with Course VII. described below.

[One hour a week for one term.]

VII.

Oratory—A study of the great orators of ancient and modern times. Each student is required to write and deliver a biographical oration on one of the great orators. Lectures on methods of public address. Courses III. and IV. above, and Course I. in English are required for admission to this course. Sections are limited to twenty-four students. This course alternates with Course VI. described above.

[One hour a week for one term.]

VIII.

Assembly Work—This course is designed to supplement the other courses in this department. It consists of debates, short orations, minute speeches, declamations, impromptus and drill work in parliamentary law.

[One hour a week for four terms.]

COURSES IN PURE MATHEMATICS.

I.

Algebra—This course includes a study of the binomial theorem, the theory of logarithms, choice, chance, variables and limits, series, determinants. Then follows a thorough study of the general properties and solution of equations, embracing the subjects of derivatives, transformation, detached coefficients, surd and imaginary roots, incommensurable roots, limits of roots, biquadratic equations, Des Cartes' and Cardan's rules; Sturm's theorem; Horner's method; roots of complex

number and trigonometric solution of cubic equations. Text-book, *Wentworth.*

[Five hours a week for one term.]

II.

Analytic Geometry—This course includes a study of the point and right line; conic sections, their equations and properties; discussion of the general equation of the second degree containing two variables; higher plane curves, equations of the third degree; different systems of coordinates; transformation of coordinates; spirals; an elementary course in geometry of three dimensions, embracing the point, straight line, plane, and surfaces of revolution; transformation of coordinates; quadric surfaces and supplementary propositions. Text-books, *Bailey*, *Wood.*

[Five hours a week for one term.]

III.

Calculus Differential—This course, as also Courses IV. and V., is designed to meet the requirements of engineering students. It includes a study by the methods for the differentiation of algebraic, logarithmic and exponential, trigonometric, and inverse trigonometric functions; successive differentiation and differential coefficients; treatment of implicit and compound functions; expansion of functions; indeterminate forms; partial differential coefficients of the first order and of higher orders; direction of curvature; radius of curvature; envelopes; singular points of curves, maxima and minima of functions of one independent variable, and of several independent variables; tracing curves, differentials of arcs, plane areas, surfaces and volumes of revolution. Text-book, *Osborne.*

[Five hours a week for one term.]

IV.

Calculus Integral — Integration of elementary forms and of rational fractions; integration by rationalization and by parts; successive integration; multiple integrals; definite integrals, limits of integration; double integration applied to plane areas; rectification of plane curves; quadratures of plane areas and surfaces of revolution; surface and volume of any solid; intrinsic equation of a curve. This course is supplemented by numerous exercises and examples. Text-book, *Osborne*.

[Five hours a week for three months.]

V.

Differential Equations — An elementary course for engineering students, supplementary to the course of Integral Calculus. It embraces: equations of the first order and first degree; equations of the first order but not of the first degree; singular solutions; linear equations with constant coefficients; special forms of equations with higher orders. Numerous applications to Mechanics and Physics are introduced during the course. Text-book, *Murray*.

[Five hours a week for six weeks.]

VI.

Advanced Work — The prescribed courses in Pure Mathematics are I. to V. inclusive. The following advanced courses are offered, based on standard authors. The text-books are not necessarily the same every year. The number of students required to constitute a class in any one subject must be at least five.

(*a*) Higher Algebra, *Hall and Knight, Smith, Crystal.* (*b*) Advanced work in Trigonometry, *Todhunter, Lock.* (*c*) Determinants, *Peck, Hanus, Muir.* (*d*) Theory of Equations, *Burnside and Panton.* (*e*) Advanced Calculus,

Byerly, *Todhunter*, *Williamson*. (*f*) Advanced Analytic Geometry, *Salmon*. (*g*) Analytic Geometry of Three Dimensions, *Aldis*, *Frost*, *Salmon*. (*h*) Quaternions, *Hardy* with *Kelland and Tait* as reference.

[Three hours' recitation a week for one subject.]

COURSES IN CIVIL ENGINEERING.

I.

Descriptive Geometry—In this course are considered problems on the point, right line, and plane; single curved, double curved, and warped surfaces; problems relating to tangent planes, to single curved, double curved, and warped surfaces; intersection of surfaces by planes, tangencies, development of surfaces; spherical projections; orthographic, stereographic, globular, cylindrical, and conic projections; construction of maps, shades and shadows; linear perspective; isometric projections; theory and plates. Numerous practical problems and exercises requiring the application of the principles of Descriptive Geometry, are added by the instructor. Text-book, *Church*.

[Three hours a week for two terms.]

II.

Surveying—This course comprises the whole theory of land surveying and leveling; the use and adjustment of the transit, compass, level, and plane table; methods of measuring; relocations of boundaries; supplying omissions; obstacles to measurement; computations; field notes and plots; laying out land; parting off land; dividing up land; Public Lands survey. Text-book, *Gillespie*.

[Five hours a week for one term.]

III.

Surveying—Field practice and application of theory; adjustment and use of instruments in the field; solution of problems in the field, the theory of which is taught in the class room; practice in keeping field notes; computation and plots.

[Five hours a week for six weeks.]

IV.

Higher Surveying—This course is a more complete treatment of the theory of Surveying than Course II. and cannot be taken until the completion of that course. It treats of the adjustment, use, and care of all kinds of engineering instruments; problems pertaining to solar attachment; topographical surveying with the transit and stadia; mining surveying; mining claims; survey of mines with shafts and drifts; determining positions of ends of tunnels, and depths below surface; theory of hydrographic and city surveying; geodetic surveying and leveling; measuring base lines; adjustments of angles, triangles, and quadrilaterals; latitude and azimuth; time and longitude; changing mean time into sidereal time and sidereal time to mean time. Text-book, *Johnson.*

[Five hours a week for one term.]

V.

Surveying—Exercises in the field in the adjustment and use of engineering instruments; stadia and plane table surveying in the field, leveling; practice in hydrographic surveying.

[Five hours a week for six weeks.]

VI.

Railroad Surveying—This course comprises all the theory pertaining to reconnoissance and preliminary

surveying for a railroad; theory and maximum economy in grades and curves; location of curves by deflection angles and offsets; obstacles to location of curves; special problems in curves; theory of compound curves; turnouts and crossings; curving the rail on curves and elevation of outer rail; easing grades on curves; vertical curves; earthwork and prismoidal formula; theory of excavation and embankment; correction in excavation on curves; cross-section leveling; theory of the transition curve and practical applications. Text-books, *Searle, Crandall.*

[Five hours a week for one term.]

VII.

Railroad Surveying—Exercises in the field; staking out and running tangents, simple, compound and transition curves; execution on the ground of many problems previously treated theoretically; survey for a short line of railroad, leveling, cross-section work, and setting slope stakes; making profiles and maps; calculating the necessary excavations and embankments and cost of construction; culverts.

[Five hours a week for six weeks.]

VIII.

Analytic Mechanics—The aim of this course is to prepare students of engineering for the study of the courses of applied Mechanics. The course comprises a study of the fundamental principles of statics, kinematics, and kinetics. The subjects selected are studied with the object of thoroughly preparing the engineering students to pursue the technical and practical branches of their respective courses. Some of the topics considered in this course are: work, energy, conservation of energy; power, composition and resolution of forces, center of gravity, center of mass, moment of inertia, ac-

celeration, dynamics of rigid bodies, laws of friction, etc. Text-book, *Ziwet.*

(*Required of students in Civil, Electrical, and Mechanical Engineering.*

[Five hours a week for first term. Two hours a week for second term.]

IX.

Geodesy—This is an elementary course prescribed for Civil Engineering students in the Junior year, and comprises a study of the instruments and methods of observation, base measurements and field work of the triangulation; method of least squares, elementary course; calculation of the triangulation, and theory of probable errors; geodetic latitudes, longitudes, and azimuths. This is followed by a brief discussion of the figure of the earth. Text-book, *Merriman*

[Four hours a week for one term.]

X.

Mechanics of Materials—This course is intended to meet the requirements of engineering students, and to prepare them, by a study of the action and effect of forces on beams and structures, to design, economically and intelligently the parts entering into a complete structure. The course comprises a study of the elastic and ultimate strength and ultimate deformation of the materials of engineering, their properties and methods of testing, and discussion of cases of simple stresses. The general theory of beams including cases of simple and cantilever beams, overhanging, fixed, and continuous beams, is thoroughly investigated. Columns are examined according to Euler's, Rankine's, and other formulae, and results compared. Some of the other subjects considered in this course, are torsion of shafts, the

transmission of power by shafts, apparent combined stresses, such as flexure and compression, flexure and torsion, etc. Compound columns and beams, reinforced concrete beams, plate girders and other forms. Then is studied the subjects, resilience and work, impact and fatigue, true internal stresses, centrifugal tension and flexure, unsymmetric loads on beams,—the course closing with a study of the mathematical theory of elasticity. Text-book, *Merriman.*

(*Required of students in Civil, Electrical, and Mechanical Engineering.*)

[Three hours a week for one term.]

XI.

Roads and Pavements—This course is intended to familiarize the student with the practical details of laying out and constructing highways, the method of drainage, grading, and most suitable road covering, the improvement of streets in cities and materials used for paving and covering. The manner of preparing the street before the paving is placed in position is fully considered and illustrated. The course includes a thorough discussion of the theory of pavements and a description of the various materials used such as cobble and stone-block, asphalt, brick, wood, and broken stone pavements. The method of preparing plans and specifications for the various conditions arising are considered and original plans are prepared by students. Attention is also given to the construction of street-car tracks in paved streets. Text-book, *Baker.*

[Four hours a week for one term.]

XII.

Engineering—This course is taken by students of Civil Engineering in the Senior year and teaches the

best approved methods of constructing engineering works and the styles of structures suitable for different localities. The study is quite comprehensive including the general theory of the arch and application to the voussoir arch; the theory of earth pressure, and the design of retaining walls; foundations suitable for structures of various classes in connection with which the student becomes acquainted, not only with the methods for ascertaining the bearing power of the foundation, but also the means for constructing deep foundations. The methods for tunnel construction, sewer construction, irrigating canals, river improvements, are included in the course and given by text-book and lectures. The part pertaining to masonry construction includes a study of the properties of stone, brick, mortar, the manner of testing, foundations under water, the crib and open caisson process, the pneumatic process, the theory of masonry arches and design, arch centers, selection of site for bridge piers and arrangement of spans, the details of construction of bridge piers and manner of location, specifications for masonry, etc. Text-books, *Howe*, *Patton*, *Baker*, *Rankin*.

[Five hours a week for two terms.]

XIII.

Sanitary Engineering—This course is a study of the principles and methods of drainage and disposal of sewage in populous districts; shape, material and calculation of sewers; catchbasins, flushing and ventilation; separate and combined systems compared; pollution of rivers; chemical precipitation; results and costs of purification; general municipal and domestic sanitation; inspection of neighboring works. Text-book, *Staley and Pierson*.

[Two hours a week for two terms.]

XIV.

Bridges and Roofs—This course comprises a study of the different systems of trussed bridges and roof trusses, and the calculation of the strains produced when loaded in any manner, the weight of the structure and the effect of wind included. Both graphical and analytical methods are used. Besides the various systems of trussed bridges, which are studied in detail, the plate girders, suspension bridges, cantilever bridges, draw bridges, and roofs of various designs are given equal attention; the purpose being to familiarize the student with the different forms and enable him to design and to estimate the cost of construction. Text-book, *Merriman*.

[Five hours a week for one term.]

XV.

Graphical Statics—This course teaches the determination of stresses in framed structures by the graphical method. Shearing forces, bending moments, centers of gravity, and moments of inertia are graphically determined by the application of the principles of the force and equilibrium polygons; also the determination of stresses in bridge trusses with parallel chords and with broken chords, caused by uniform loads and locomotive-wheel loads; graphical determination of stresses in roof trusses, graphical treatment of the arch, symmetrical and unsymmetrical cases; graphical method of arch-ribs of hinged ends, and of fixed ends; stress diagrams; temperature stresses; braced arches; graphics applied to continuous girders. This course is supplemented by full explanations, notes, examples, and problems. Text-book, *Merriman*.

[Five hours a week for one term.]

XVI.

Hydromechanics—This course is a thorough study of the theory of hydrostatics, hydraulics, and hydrodynamics, to which are added many practical exercises. The subjects submitted are the transmission of pressures, center of pressures; velocity of flow from orifices of various shapes; fluid friction; Bernaulli's theorem with friction; Chezy's formula; Kutter's formula; flow over weirs, and through tubes; flow in pipes; loss of head in in friction and other losses; flow in conduits, canals, and rivers; velocities in cross sections; methods of gauging the flow, measurement of water power, dynamic pressure of flowing water; designing of waterworks and standpipes; hydraulic motors and relative merits; discussion of water wheels of different types, and a study of the conditions determining high efficiencies; classification of turbines, and a complete study and discussion of the different forms. Text-book, *Merriman*.

[Three hours a week for two terms.]

COURSES IN MECHANICAL ENGINEERING.

I.

Thermodynamics—The subject begins with a theoretical study of the steam engine, gas engine and other heat motors involving the laws of thermodynamics of gases, saturated vapors and superheated steam. The applications of this preliminary work are then dwelt upon, and prime movers, the injector, condenser, refrigerating machinery, boilers and pumps are studied in detail. Frequent reference is made to trade catalogues, of which an abundant supply should be obtained by the student. Text-book, *The Steam Engine*, by Holmes.

[Five hours a week for one term.]

II.

Materials of Engineering — This course, supplemented by shopwork and laboratory work in testing materials of construction, is designed for the purpose of acquainting the student with the properties of the material he will use in his profession. Tensile and shearing strength, elasticity and resistance are studied, together with the effects of strain, intermittent loading and impact. The process of manufacture of the most important materials is taken up and estimates of the cost of construction at market prices complete the work. Thurston's *Materials of Engineering* is the text-book used.

[Two hours a week for one term.]

III.

Steam Engine Design — In this course the forms and sizes of steam engines, computation of dimensions and advantages and adaptation of special forms of engines for specific work are taken up, giving the student a thorough knowledge of constructive detail. The latest researches and contemporary practice may be consulted in the numerous publications found in the University Library. During the first term of the Senior year is required the complete design with working drawings of a simple non-condensing steam engine for a specific purpose. The second term is given to designing a multiple expansion, jacketed, condensing engine for marine service. The text-book used is Whitham's *Steam Engine Design*.

[Five hours a week for two terms.]

IV.

Steam Boilers — This subject is treated much as that of Course III. The determination of sizes of parts

from considerations of strains, thickness of shells, size of rivets, braces, furnaces and proper methods of connection of boilers with efficiency of furnaces and life of boiler, are some of the subjects considered. The method of determining the efficiency of fuels, heating surface, heights of chimneys, boiler settings and materials used in construction are also discussed. Text-book, *Steam Boilers* by Munro.

[Three hours a week for one term.]

V.

Kinematics—This course treats of the geometry of machinery, the determination of the paths of the various parts of an elementary combination and the constraining of the parts to move in these paths. The general theory is then applied to cams and gear teeth, the relative motion of machine parts and kinematic trains, belts, pulleys, speed cones, link work and other aggregate combinations. Barr's *Kinematics of Machinery* is the text-book used.

[Three hours recitation and two hours drawing a week for one term.]

VI.

Machine Design—This work involves a study of the form and strength of machine parts as applied in designing, with computation of dimensions for fastenings, bearings, rotating pieces, belt and tooth gearing, etc. The derivation of rational formulæ and the determination of empirical formulæ are included and applied in designing. The text-books used are Unwin's *Elements of Machine Design*, Low's *Handbook for Mechanical Engineers* and Reed's *Machine Design and Drawing*.

[Three hours a week for one term.]

VII.

Valve Gears—This course includes a complete study of the Bilgram diagram as applied to slide valves and the principal automatic cut-off engines. The radical gears, such as Hackworth, Walschært, Marshall and Joy are treated in the same way and in conclusion the student is made familiar with the various types of Corliss valves, shifting eccentrics aud link motions. The text-book is Halsey's *Valve Gears*.

[Two hours a week for one term.]

VIII.

Mechanical Laboratory—The work taken up includes a study of the methods of testing the steam engine under varying running conditions, valve setting, calibration of thermometers, gauges and indicator springs, use of Prony brake, Weber and Emerson dynamometers, Pelton water wheel, Wier calibration, etc. Text-book, Carpenter's *Experimental Engineering*.

[One afternoon each week for one term.]

IX.

Hydraulics—The object of this course is to give such information in regard to modern turbines and their installation as is necessary to the hydraulic engineer in designing a water power plant without going into the details of turbine wheel designing. Text-book, Thurso's *Modern Turbine Practice. (Required of Seniors in Mechanical and Electrical Engineering*.

[Five hours a week for one term.]

X.

Steam Engines and Boilers—A brief course in the study of boilers and steam engines designed to familiarize the student with the different types in use and

their respective merits. Only that theory is taken up which is necessary to the working out of practical problems, the ultimate object of the course.

Students taking this work must provide themselves with an abundant supply of trade catalogues. Text-book, *Power and Power Transmission*, by Kerr.

[Three hours a week for one term.]

XI.

Gas and Vapor Engines—This course, extending over two terms, is given to a general descriptive study of all the types of gas engines and explosive motors. The general construction of gas, oil and vapor engines is studied together with their adaptation to various uses. Results due to change in ignition, compression and variation of working fluid; methods of speed regulation and government and the details of auxiliaries as, pumps, carburetters, hot tubes, batteries, spark coils and dynamos are dwelt upon. The text-book used is *Gas, Oil and Vapor Engines*, by Hiscox.

[Five hours a week for two terms.]

XII.

Gas Engine Design—A complete study of the thermodynamics and design of the gas engine, by text-book, lectures and drawing board. The major subjects taken up are power, efficiency, economy, forces due to gas pressure and inertia and dimensions of engine parts. Lucke's *Gas Engine Design* is the text-book used.

[Five hours recitation and ten hours drawing a week for two terms.]

XIII.

Gas Engine Construction—The complete working up from rough castings and forgings of a small type of gas engine. This is part of the thesis work for students

in the Short Program and requires the complete machining and assembling of the engine and must be preceded by Courses XI. and XII.

[Three hours a week for two terms.]

XIV.

Gas Engine Laboratory — Indicator practice, commercial efficiency, governing, economy, speed regulation. Experiments in ignition, spark coil construction, carburetters and vaporizers. Test of engine constructed by student.

[Two afternoons each week for two terms.]

Thesis — Each candidate for a degree in Mechanical Engineering must present for graduation a thesis of considerable magnitude which will exhibit his knowledge of the course he has followed. It may embrace designing, experimental investigation or original research in a subject selected by the student and approved by the professor. The major part of the second term, Senior year, is devoted to this work, and graduation is conditional upon the knowledge of Mechanical Engineering displayed in its preparation.

COURSES IN ELECTRICAL ENGINEERING.

I.

Applied Electricity — A course of lectures and recitations, supplemented by laboratory practice, on the general theory of electricity and magnetism and its application to practical work, as follows: Setting up and testing primary and secondary batteries, systems of call bells, electric and gas lighting appliances, fire and burglar alarms, telegraph and telephone lines, switchboards and accessories. Experiments with induction coils, magnets,

switches, voltmeters, ammeters, wheatstone bridges, galvanometers and other measuring instruments. The study of direct current generators and motors, arc and incandescent lighting systems, street railway machinery and appliances, electric heating and forging, electrolytic processes, etc. Text-book, Swoope's *Practical Electricity*.

(*Students in Architecture spend one term in this course.*)

[Five hours a week for two terms.]

II.

Applied Electricity—Lectures and laboratory work on the construction and testing of switches, magnets, measuring instruments, induction coils, etc. The calculation of sizes of wire and location of circuits for lighting and power, the experimental study of alternating current machinery and accessories.

If the student has acquired sufficient skill in handling tools in his workshop, he may design and build a small dynamo, starting with rough castings, doing all the fitting and finishing, winding and adjusting, and finally testing for insulation, efficiency, and adaptability to special purposes. This course must be preceded by Course I.

(*Courses I. and II. are required in the Short Program in Electrical Engineering; they are elective for general students and those studying telegraphy.*)

[Five hours a week for two terms.]

III.

Dynamo-Electric Machinery—Recitations on the physical theory of dynamo machines, armature actions and reactions, characteristic curves, mechanical points, theory of armature winding, the mathematical theory of alternating currents, phase relations, modern forms of single phase and multiphase generators and motors, design of transformers. Text-books, Sheldon's *Dynamo*

Electric Machines, Sheldon and Mason's *Alternating Currents*.

[Five hours a week for two terms.]

IV.

Electrical Laboratory — Practical work at wiring buildings for lights and power, testing circuits for insulation and grounds, construction and operation of storage batteries, management and care of dynamos, characteristic curves of particular machines under different conditions, efficiency tests of motors by absorption dynamometer methods, alternating current dynamo and transformer tests, the testing of storage batteries, and complete plant-efficiency tests. Careful notes are taken.

[Five hours a week for two terms.]

V.

Designing — The designing and making of working drawings of switches, resistance, and other electrical apparatus. Calculation of sizes of wire and location of circuits for lighting buildings. Complete drawings of direct and alternating current dynamos. Laying out plants for power and lighting.

[Three hours a week for two terms.]

COURSES IN SHOPWORK.

(*In the description of the following courses an "hour" means two sixty minute periods in the shop.*)

(*a*) **Woodwork** — Exercises in planing, splicing framing, scroll-sawing and turning.

[Three hours a week for one term.]

(*b*) **Applications of Carpentry** to pattern-making, cores etc., including parts of machines, pipe joints, cranks and bearings.

[Three hours a week for one term.]

(*c*) **Foundry Practice**—Setting up and drawing simple and complicated patterns. Lectures on heating and pouring metals for different purposes. Core making.

[Three hours a week for one term.]

(*d*) **Iron Forging,** welding, annealing, shaping, tool making, tempering and case hardening.

[Three hours a week for one term.]

(*e*) **Benchwork** in iron, including surface-chipping, key-setting, draw-filing, scraping and polishing.

[Three hours a week for one term.]

(*f*) **Accurate Work** on lathe, planer, shafting and milling machines. Construction of machine tools, reamers, taps, twist-drills, gear wheels and complete machines.

[Three hours a week for two terms.]

COURSES IN ARCHITECTURE.

I. and II.

Construction—In these courses the student obtains a thorough knowledge of the materials and methods of the mason's, carpenter's, metal worker's and painter's trades. Each trade is considered separately, and at conclusion an exhaustive study of specification writing and methods of estimating for it is made. The University constantly furnishes employment to a large force of trained mechanics who will give personal lessons to the

student in all branches of these trades. Inspection visits are made weekly, as a supplementary exercise in superintendence, to important building operations in the neighborhood. Detail drawings of constructive methods are made exactly as in an architect's office.

In the spring terms of his last three years each student is required to stake out on the campus one of his projects and to furnish all levels required by the builder in order to acquire thoroughness in the use of the architect's level and compass.

[Two hours a week for four terms.]

III.

Advanced Construction — In this course the student studies the construction and design of steel framing, fireproofing of all forms, reinforced concrete, footings and foundations.

Working drawings for one of the student's projects are made. Especial care and accuracy are demanded in the preparation of the framing plans and details. This work is traced and blue-printed by Freshmen.

[Two hours a week for two terms.]

IV.

Architectural Engineering — A course in which are solved graphically and analytically more complicated problems in structural design and applied mechanics, with especial study of reinforced concrete.

[Five hours a week for two terms.]

V.

Sanitation — This study is taught from text-book and embraces sanitary engineering pertaining to buildings, as follows: sewerage, water supply, lighting and ventilation, plumbing work, subsoil drainage, dry foundation

walls and cellars; also drawings of plumbing systems and fixtures.

[Two hours a week for one term.]

VI.

Heating and Ventilation—This course is a study of the theory and practice of heating and ventilating public buildings and dwelling houses. The different systems of heating,—furnace heating, hot water, steam, etc.,—are carefully examined and studied. The radiation of heat from surfaces, the different systems of piping, condition of air as to moisture, amount of air required, causes and best means adopted to secure pure air; the necessity of good ventilation and the latest approved methods for securing this all important feature are some of the topics considered in this study.

[Two hours a week for one term.]

VII.

Business Relations—This course consists of lectures in which are given descriptions of a system of bookkeeping suited to the needs of an architect's business, a system of building accounts, filing systems for catalogue and prints, a card index system for prints and general information; of forms for agreements with clients, for proposals and acceptances, for contracts and bonds, and for certificates; the laws affecting clients, contractors and architects; and the rules of professional ethics in private practice, competitions and municipal affairs.

[One hour a week for one term.]

VIII., IX., X. and XI.

History of Architecture—This course comprises a study of the early beginnings, growth and development of Architectural styles. It includes Ethnography as applied to Architectural Art; Ancient Architecture;

Egyptian Architecture; Assyrian Architecture; Grecian Architecture; Etruscan; Roman and Sassanian Architecture; Christian Architecture in France, Belgium and Holland, Germany, Scandinavia, England, Spain and Portugal, and Italy; Saracenic and Ancient American Architecture; Byzantine Architecture.

[Two hours a week for three terms.]

XII.

History of Ornament—A study of the origin and evolution of ornament and the application of the same, together with exercises in motive.

[Two hours a week for one term.]

XIII.

History of Allied Arts—A brief study of the field of Arts with especial reference to sculpture, metal working, mural painting, stained glass and mosaic.

[Two hours a week for first term.]
[One hour a week for second term.]

XIV.

History of Construction—A critical study of the types of Construction of the ancient, medieval and modern builders, tracing the relation of the type to the problem and the development of the style from the type.

[Two hours a week for one term.]

XV.

The Elements of Architecture—This course is a study of the Five Orders of Architecture and is given by lectures, recitations and drawings. The study embraces a thorough analysis of each Order, in which the principal and distinguishing features of each are clearly shown and comparisons made. Also a study in detail of the forms and proportions characterizing each is made in the

class-room. Problems pertaining to the Orders are given in the Drawing-room, and detail drawings and colorings made.

[Eight hours a week for two terms.]

XVI., XVII. and XVIII.

Design — The study of problems in Architectural Design, embodying the subjects of composition and form. This course expands from Elementary Design (second year) to Advanced Design and Thesis Work (fourth year), and includes the handling of design in monumental structures, and its application to modern buildings, such as hospitals, theaters, municipal buildings, libraries, churches, etc.

The program for the second year requires the execution of nine minor, and nine major problems; that for the third year of nine minor and six major problems; that for the fourth year of four minor and three major problems and the thesis.

Students of the Engineering course will be given Engineering problems exclusively, beginning with the second term of the third year.

[Seven, eight and twelve hours a week, respectively, for three years.]

XIX.

Theory of Design — A thorough study of the principles of planning and proportion, supplemented by study of the perfections and faults of the world's most famous buildings.

[One hour a week for two terms.]

COURSE IN ASTRONOMY.

Astronomy — Practical. This course is designed to meet the requirements of Civil Engineering students and to give them the training and information necessary for intelligently executing certain departments of work to which they may be assigned in the course of their professional career. The course comprises a study of astronomical instruments as well as instruments of more precision than those used in ordinary surveying. The adjustment and use of these instruments are considered, and instruction is given in methods of observation and computations; problems in finding right ascensions and declination; different methods for finding latitude, longitude and time are studied in detail, and the methods of making the observations and their adjustments, and discussion of errors. Conversion of solar time into sidereal, and sidereal time into solar. In connection with this subject is given a more complete study of many of the topics considered in elementary astronomy, as here they are treated mathematically; as for example, methods for finding parallax, computation of eclipses, altitudes and correction for refraction. The subjects of procession,—nutation—annual aberration—proper motion of stars, etc., are studied. Text-books, *Young*, *Greene*.

[Three hours a week for one term.]

COURSES IN GEOLOGY.

I.

Mineralogy—Lectures, recitations, and laboratory work. A study of crystallography and the classification of minerals, accompanied by practice in the laboratory and museum in the determination of minerals, especially the ores. Blow-pipe analysis. Text-book, *Crosby*.

[Two hours a week for one term.]

II.

Assaying—Chiefly laboratory work. Furnace assaying of the ores of gold, silver and lead. Text-book, *Ricketts*.

[Two laboratory hours a week for one term.]

III.

Geology—Lectures, recitations, demonstrations. The study of the general features of the earth; the material composing the accessible parts of the earth; the arrangements of the material in rocks; the causes of geological changes; the history of the earth and the various forms of life that existed in the different periods of successive geological ages. Text-book, *Brigham*.

[Four hours a week for one term.]

COURSES IN PHYSICS.

I.

Physics—A complete course of recitations and lectures, including mechanics, heat, sound, light, electricity, and magnetism. The work is fully illustrated by experiments. Text-book, *Carhart* and *Chute*.

[Five hours a week for two terms.]

II.

General Physics—In this course there is a more extended treatment of the same subjects than is given in Course I. Mathematical principles are applied to physical phenomena. Special attention is paid to accuracy in the mathematical work and in the statements of the principles involved. Lectures and recitations. Textbook, *Hastings and Beach.*

[Three hours a week for two terms.]

III.

Physical Problems—The application of mathematics in physical work. Measurements of length, mass and time. Work in mechanics, heat, light, sound, electricity and magnetism. The work is done in the laboratory and the student is taught to depend on his own resources and to check his results.

[Two laboratory hours a week for two terms.]

IV.

Physical Laboratory—Special advanced work in heat, light, mechanics, sound, electricity, and magnetism. Accuracy in observations and in the calculation and recording of the results is required. Students may specialize here according to the program which they are following. This course must be preceded by Courses II. and III.

[Three hours a week for two terms.]

COURSES IN CHEMISTRY.

(*In the description of these courses, an "hour" means two sixty-minute periods in the laboratory or one in the lecture room.*)

I.

(*a*) **General Chemistry**—A minor Course dealing with the general principles of chemistry and embracing a study of only the commoner elements and their typical compounds. Text-book, *Remsen's Elements of Chemistry.*

[Four hours a week for one term.]

(*b*) **A Laboratory Course** covering in the laboratory the work of the Lecture Course (I. *a*) and designed to accompany it. *Laboratory Manual, Maguire.*

[One hour a week for one term.]

II.

(*a*) **General Descriptive Chemistry**—Recitations and experimental lectures treating of the fundamental principles of chemistry, and designed to meet the requirements of the students of the College of Engineering. Text-book, *Hessler and Smith.*

[Two hours a week for two terms.]

(*b*) **A Laboratory Course** arranged to fit the needs of Engineering students.

[One hour a week for two terms.]

III.

(*a*) **Advanced Inorganic Chemistry**—For Biological, General Science and Chemistry students. Lectures and recitations. A complete study of the elements and their most important compounds, following the classifi-

cation based on Mendeleeff's Law, and including a discussion of the theories of the science. Careful attention is given to the technical chemical processes and industries, and to the writing of chemical reactions. Text-book, *Newth's Inorganic Chemistry*.

[Two hours a week for two terms.]

(*b*) **Experimental Chemistry**—A Laboratory course to accompany Course III. (*a*), the work consisting of the preparation by the student of the elements and their more typical compounds, determination of molecular weights, verification of the fundamental laws of chemistry, etc. During the latter part of the course, special attention is given to the characteristic reactions of the metals and to the principles of chemical analysis. Text-book, *Thorp*.

[Two hours a week, with discussion, for two terms.]

IV.

Qualitative Analysis—The work of this course comprises, in the laboratory, the study of the reactions involved in the separation and detection of the more common inorganic bases and acids, the analysis of salts, mixtures of salts, and complex substances such as earths, ores, ashes, etc. Text-book, *Perkin*, supplemented by lectures.

[Four hours a week, with recitation, for one term.]

V.

Quantitative Analysis—A laboratory study of the principles involved in the quantitative separation and estimation of substances, both gravimetrically, and volumetrically. Complete analysis of a number of simple salts, like Barium Chloride, with partial analysis of substances such as steel, lye, drinking-water, etc. Text-books, *Appleton*, *Schimpf*.

[Four hours a week, with recitation, for one term.]

VI.

(*a*) **Elementary Organic Chemistry** — Lectures and recitations. A systematic study of the hydrocarbons and their derivatives, and the investigation of their properties. Special attention is given to the Aliphatic and Aromatic series. Text-book, *Remsen*.

[Three hours a week for one term.]

(*b*) **Experimental Organic Chemistry** — A course fitted to accompany the preceding, involving the preparation by the student in the laboratory of the most important and typical organic compounds, and the investigation of their properties. Text-book, *Gattermann's Manual*.

[Two hours a week for one term.]

VII.

Urinary Analysis and Toxicology — A course of laboratory exercises in the methods employed in the detection and estimation of the constituents of the urine, and of the alkaloids and principal organic poisons. Text-book, *Holland*.

[Three hours a week for one term.]

VIII.

Technical Chemical Analysis — Advanced courses intended for students specializing in Chemistry. Special courses, at the option of the student in

I. **Gas Analysis.**
II. **Water Analysis.**
III. **Sugar Analysis.**
IV. **Commercial Organic Analysis.**
V. **Oils and Fats.**

[Five to fifteen hours a week for two terms.]

IX.

(*a*) **Advanced Organic Chemistry** — An advanced course, intended for students specializing in chemistry. Lectures and recitations and discussion of special subjects of organic chemistry, synthetic chemistry, isomerism, and stereochemistry. Text-books, *Cohen* and special reference works.

[Two hours a week for one term.]

(*b*) **Advanced Organic Laboratory** — (1) The first term of this course is spent principally in the making of organic preparations by methods demanding special care, skill and accuracy in the student. (2) The second term is devoted to ultimate organic analysis, qualitative and quantitative; analysis of carbon, hydrogen, the halogens, sulphur and nitrogen in organic compounds by the various methods; also in the determination of molecular weights of organic compounds. Text-books, special notes and reference works.

[Ten to fifteen hours a week for two terms.]

X.

General Pharmaceutical Chemistry — In this course, the chemical bases and their compounds are considered, with special reference to their importance in Pharmacy and Materia Medica. Text-book, Sadtler's and Trimble's *Pharmaceutical Chemistry*.

[Two hours a week for one term.]

XI.

(*a*) **Electrochemistry** — Lectures, experiments and recitations on the principles of electrochemistry and their application in the chemical industries, separation of metals, the preparation of chemical elements and electrosynthesis of compounds. Text-books, *Classen* and *Lüpke*.

[Two hours a week for one term.]

(*b*) **Electrochemical Laboratory** — A laboratory course accompanying Course XI. (*a*). Experiments demonstrating the laws and principles of electrochemistry, electrolysis, electrosynthesis and electrometallurgy. Quantitative determination of metals electrolytically. Text-books, *Lüpke* and *Classen*.

[Two hours a week for one term.]

XII.

History of Chemistry — The subject is divided into topics and epochs of special interest in the development of chemistry as a science. These are discussed at length, together with the biographies of the men who aided in their development. Lectures and recitations. Seminar and journal work for advanced students. Text-book, *Meyer*. References to chemical periodicals.

[Three hours a week for one term.]

XIII.

(*a*) **Physical Chemistry** — Lectures, recitations and demonstrations, experiments on the subjects of gas density, solutions, chemical dynamics, the Phase Rule, thermochemistry, photochemistry, etc. Text-book, *Van Deventer*.

[Two hours a week for one term.]

(*b*) **Experimental Physical Chemistry** — Laboratory work to accompany XIII. (*a*). Vapor density methods, calorimetric demonstrations, molecular weight demonstrations by the freezing and boiling point methods, etc.

[One hour a week for one term.]

XIV.

Industrial Chemistry — Lectures, recitations and laboratory work. The consideration of chemical manufacture, fuels, etc., and the preparation in the labora-

tory of chemically pure substances, organic and inorganic. Special reference books and journals.

[Five hours a week for two terms.]

XV.

Advanced Quantitative — Mostly laboratory work in special methods for gravimetric and volumetric determinations of inorganic substances. Special reference work.

[Five hours a week for one term.]

XVI.

Research Work — Special facilities are offered to graduate students desiring to do original research work in chemistry, preparatory to the Master's or Doctor's degree.

See requirements for degrees pages 28, 29.

COURSES IN BOTANY.

(In the description of these courses an hour means two sixty minute periods in the laboratory or one in the lecture room.

I.

Botany — Lectures and recitations on the morphology of the root, stem, leaf, flower, fruit and seed; the development of the embryo and the processes of pollination and fertilization; the study of the vegetable cell, of its products, of cell formation, of plant tissues and the various physiological phenomena; the structure, growth, reproduction and general classification of the Algae, Fungi, Lichens, Mosses, Ferns, and the higher plants. Text-book, Bastin's *College Botany*.

[Four hours a week for two terms.]

II.

Botanical Laboratory — Supplementary to Course I. Special microscopical study of Thallophyta, Bryophyta, Pteridophyta, and Spermaphyta referred to in Course I. Drawings must be made of all plants examined. Plants under these headings are collected and put before the student that he may become familiar with their morphology, structure and classification. The course is to accompany or to be preceded by Course I. Provision is also made in this course for students in pharmacy to take a special laboratory course in Pharmaceutical Botany. Study of the determination and classification of the simpler officinal plants. The analysis of the Phanerogams occupies the time during the spring months and the student is made familiar with the habitat and characteristics of the local flora. Text-book for classification of plants, Britton's *Manual.*

[One laboratory hour a week for two terms.]

III.

Advanced Botany — Lectures, recitations, demonstrations. The work of this course is essentially the same as that laid out in *Strasburger's* or *Vine's* text-book of Botany. Special study is made of the Physiology, Ontogeny, Phylogeny, Ecology and classification of plants. Text-book, *Strasburger.*

[Three hours a week for two terms.]

IV.

Laboratory for Advanced Botany — Supplementary to Course III., and either following or accompanying it.

(*a*) **Plant Histology and Physiology** — Half of the time allotted for laboratory work is devoted to Plant Histology and Physiology. The student is required to study practically the methods of killing, fixing em-

bedding, sectioning, staining, mounting and drawing of plant tissues. Text-book, *Chamberlain*.

(*b*) **Plant Classification, Advanced** — The other half of the laboratory work is devoted to the determination and classification of the more difficult plants, the Compositae, Grasses, Mosses, Myxomycetes, etc. Herbarium study is required, as well as preparing and collecting plants for preservation. During spring and autumn frequent excursions into the neighboring fields and woods are made for the purpose of studying and collecting for preservation the local aquatic and land flora. Text-book, Britton's *Manual*.

[One and one-half to two hours a week for two terms.]

V.

Systematic Botany — Principally laboratory and herbarium work in special groups of Phanerogams and Cryptograms. Study of nomenclature and classification of plants. This course is designed to meet the needs or inclinations of students specializing in Botany. Library reference books and seminar work.

COURSES IN ZOOLOGY.

I.

This course comprises:

(*a*) Lectures, recitations and demonstrations based upon Nicholson's *Text-book of Zoology*.

(*b*) Lectures, readings and recitations based upon Parker's *Elementary Course in Biology*.

(*c*) Laboratory work on Invertebrata as outlined in Pratt's *Invertebrate Zoology*, and Parker's *Biology*.

(*d*) Mammalian Osteology including the study of one or two types of skeletons belonging to each order of mammalia. The work is outlined in Kirsch's *Elementary Course in Mammalian Osteology.*

[Two recitation hours and three laboratory periods for first term; three recitation hours and three laboratory periods for second term.]

II.

This course comprises:

(*a*) Recitations, lectures and demonstrations based upon Hertwig's *Manual of Zoology.*

(*b*) Laboratory work upon some Invertebrata in order to complete and supplement the work under (*c*) in Course I.

(*c*) Dissection and laboratory work upon one or two types in each of the classes of Vertebrata, viz: Fish, frog, newt, turtle, snake, mammal; the text-book used is Pratt's *Vertebrate Zoology.*

(*d*) A more extended study of mammalia with reference to the cat as outlined in Davison's *Mammalian Anatomy.*

(*e*) An outline of comparative Embryology of animals. Text-books, *Packard* and *Foster and Balfour.*

[Three recitation hours and three laboratory periods for two terms.)

COURSES IN MICROSCOPY.

I.

Microscopy—Lectures and laboratory work. Refraction and dispersion of light and illumination. The index of refraction in different media. Different shapes of lenses. Spherical and chromatic aberration. The selection and care of a good microscope. The use of accessories for advanced work; immersion and adjustable

objectives, camera lucida, sub-stage condenser, polarizer, micrometers, etc. Special work in photo-micrography. Text-book, *Gage*.

[Two hours a week for one term.]

II.

Micro-Chemistry — Laboratory work. The preparation of micro-chemical reagents and their application in testing, fixing, hardening, staining, cleaning, and mounting tissues and organs.

[One laboratory hour a week for one term.]

COURSES IN HUMAN ANATOMY.

I.

Human Histology — Laboratory work and demonstrations. Preparations of the tissues and organs of the human body given to each student, and their structure demonstrated. This course is taught in connection with Course I. under Courses in Human Physiology.

II.

Human Histology — Lectures, recitations and laboratory work. The work covers a thorough course in Normal Histology, with the methods of hardening, staining, embedding, section cutting, and mounting of tissues. Careful work on the nervous system—brain and spinal cord, termination of nerve fibres, etc. Drawings made from each preparation. Text-book, *Piersol*.

[Two laboratory hours a week for two terms.]

III.

Human Anatomy — Lectures and recitations. Osteology and the descriptive anatomy of the muscular, vascular and nervous systems and of the organs of special sense. The anatomy of the viscera. Text-book, *Gray*.

[Three hours a week for four terms.]

COURSES IN HUMAN PHYSIOLOGY.

I.

(*a*) This course comprises lectures, recitations and demonstrations based upon Thornton's *Text-book of Human Physiology*. A liberal supply of models, charts and manikins are at hand to facilitate all demonstrations required.

(*b*) Laboratory work consisting of a selected number of experiments so arranged as to give the student a fair insight into modern experimental Physiology.

(*c*) A limited number of microscopial preparations are required to be made by each student, and he must examine a set of typical preparations in order to acquire a fair knowledge of the microscopial structure of the tissues and organs of the human body.

(*d*) During the course special lectures will be given upon personal, domestic and municipal hygiene.

[Three recitations and one laboratory period for two terms.]

N. B.—Students of Pharmacy must take sections (*a*) and (*d*) but may select either (*b*) or (*c*).

II.

(*a*) This course comprises a complete study of Human Physiology such as is required of students of medicine. The lectures, recitations and demonstrations are based upon Kirke's *Handbook of Physiology* and Hall's *Text-book of Physiology*, moreover, the student will have free access to a copy of *The Ameridan Text-book of Physiology* for special references

(*b*) Laboratory work in Experimental Physiology. The manual used is Hall's *Experimental Physiology*, but the student will have free access to a number of other similar works.

[Four recitation hours and two laboratory periods for two terms.]

COURSE IN BACTERIOLOGY.

Lectures and Laboratory Work—Lectures on the form, structure, reproduction and classification of Bacteria. The relations of bacteria to disease, etc. The principles of sterilization, thermal and chemical, are pointed out. The early part of the laboratory work is occupied in the preparation of the various culture-media and in studying pure cultures of certain non-pathogenic bacteria in these media. Observations on the microscopic characteristics of bacteria and special attention to the microscopic technique required in Bacteriological work. Later on in the course some time is devoted to practice in isolation and identification of pathogenic bacteria. Emphasis is given to the detection of pathogenic germs by the various staining processes. Inoculation of animals. Bacteriological investigation of water, air and soil. Text-book, Abbot's *Principles of Bacteriology*.

[Three laboratory hours a week for one term.]

COURSES IN PHARMACY.

I.

Elements of Pharmacy—Lectures and recitations on the art and science of Pharmacy, and demonstrations of the various Pharmaceutical processes. Text-book, Remington's *Practice of Pharmacy*.

[Three hours a week for two terms.]

II.

Galenical Pharmacy—A laboratory course to accompany Course I. This course consists of the practical

application of the pharmaceutical processes to the manufacture of official preparations of the United States Pharmacopœia and of unofficial and N. F. preparations.

[Three hours a week for one term.]

III.

Inorganic Pharmacy—Laboratory, demonstrations and recitations. A thorough course in the preparation and testing of Pharmaceutical and Technical Chemicals.

[Six hours a week for one term.]

IV.

General Pharmacy — A systematic classification of organic and inorganic drugs and preparations from a pharmaceutical standpoint followed by a close study of each of the classes.

[Two hours a week for two terms.]

V.

Magistral Pharmacy — Includes the manifold methods of extemporaneous Pharmacy with consideration of incompatibility, posology, and the principles of Elegant Pharmacy. Dispensing and prescription practice.

[Three hours a week for one term.]

VI.

Pharmaceutical Chemistry — Chiefly assaying, testing and mannfacturing. Some attention is given, however, to toilet and commercial preparations with a view to the invention and development of original formulas.

[Five hours a week for one term.]

VII.

General Pharmacy — Pharmaceutical analysis and assaying, micro-chemical, polariscopic and spectroscopic estimations. Incompatibilities and methods of manufacture.

[Five hours a week for one term.]

MATERIA MEDICA, PHARMACOGNOSY AND THERAPEUTICS.

VIII.

(*a*) **Materia Medica**—A detailed consideration of medicinal substances, their constituents and use.

(*b*) **Pharmacognosy**—The identification of drugs by their physical properties with special reference to quality.

(*c*) **Therapeutics**—With reference to Therapeutic action, dose and antidote, drugs will be studied in groups as well as individually.

[Three hours a week for three terms.]

IX.

Pharmaceutical Arithmetic—This work embraces a study of weights and measures, percentage, relationship of systems, reducing and enlarging formulas, alligation and chemical problems.

[Three hours a week for one term.]

COURSES IN MECHANICAL DRAWING.

The instruction begins with sketching from blocks, of various geometric forms, so that the hand and eye may be trained in Outline Drawing in pencil and pen. Then follows the study of light and shade.

After considerable practice, and when a thorough knowledge of freehand drawing has been acquired, the use of instruments is taken up. Beginning with the instruments, attention is given to accurate draughtmanship upon plates, illustrating problems of Civil, Electrical, Mechanical and Architectural Engineering. This work is continued throughout the Courses.

[*Two hours of actual time in drawing are required for each credit hour on the schedule.*]

I.

Freehand—This course consists of sketching with pencil and pen from flat copies and models of machine parts, and freehand lettering. Later in the term, the use of instruments, section-lining and lettering are taught. Text-book, Jamison's *Elements.*

[Three hours a week for one term.]

II.

Projection Drawing—The course embraces the principles of projections, methods of shop-drawing, tinting, tracing, blue printing, line-shading and the preparation of working drawings of complete machines. This Course must be preceded by Course I. Text-book, Jamison's *Manual.*

[Three hours a week for one term.]

III.

Descriptive Geometry—A series of accurate plates is made, illustrating the principles of orthographic and spherical projections, shades and shadows, perspective and isometric projections. (*Students in Architecture are required to do advanced work in shades and shadows and perspective.*)

[Four hours a week for two terms.]

IV.

Kinematic Drawing—Designing of cams and gear teeth, complete working drawings of machines involving the application of kinematics and the computation of dimensions.

[Two hours a week for two terms.]

V.

Topography—Pen and colored topographical drawing, conventional signs, map drawing from notes taken

from surveys. This course must be preceded by Course I. Text-book, *Reed*.

[One hour a week for two terms.]

VI.

Stereotomy—This course comprises a study of the application of the principles of Descriptive Geometry to the determination of the forms and sizes of the stones used in the construction of the different classes of arches and masonry structures. This course is given by lectures in the Drawing Room, explaining the construction of templates, and use of directing instrument; also explanations of methods of drawing plans, elevation and development of oblique arches, wing walls and the like. A certain number of plates and drawings is required, illustrating the methods of performing practical work.

Drawing and designing plans, elevations and sections of masonry constructions, foundations, dams, piers, abutments, culverts and arches. Text-book, *French*.

[Three hours a week for one term.]

VII.

Bridge Designing—This course proceeds from simple framed girders to complete bridge-trusses of various designs,—required of Juniors in Civil Engineering. Complete design of a railroad bridge and detail drawings,—a short general course of bridge designing for Seniors.

[Three hours a week for two terms.]

VIII.

Mechanical Drawing—A continuation of Courses I. and II. embracing advanced work in machine drawing and the elementary principles of mechanical design with calculatiou of dimensions and construction of drawings from sketch-book notes. Text-book, Low's *Machine Drawing and Design*.

[Three hours a week for two terms.]

IX.

Freehand—The principles of Freehand drawing in in pencil and pen from objects, and later from biological specimens, plants, animals and microscopical preparations.

[Two hours a week for two terms.]

X.

Freehand—Advanced drawing from plants and anatomical dissections of animals. Illustrations for publications.

[Two hours a week for two terms.]

XI.

Water Color—Drawing in water color from still life and nature.

[One hour a week for one term.]

XII.

Rendering in Water Color—The rendering of architectural drawings, including perspectives;—casting of shadows, color treatments of buildings, and handling of foreground and background.

[One hour a week for one term.]

XIII.

Pen and Ink—Rendering drawings in pen and ink from studies by noted artists in this branch of art; followed by rendering of original drawings.

[One hour a week for one term.]

COURSES IN ARTISTIC DRAWING.

In this department the aim is to lay a thorough foundation in drawing for those who want to make Art a profession, but the courses are so arranged as to be accessible to other students. The system of teaching, which is that followed in the best art schools, is intended to develop the individuality of each student, so that with a good understanding of the principles of art he may interpret nature according to his own temperament.

The work is done altogether from cast, object and nature. The immediate surroundings of the University buildings, the lakes and the Saint Joseph River offer many beautiful subjects for the study of landscapes, and the classes are taken out in the summer for this study.

To the old collection of casts has been added a new one, which was carefully selected at the National School of Fine arts in Paris, where all the casts are moulded directly from the originals. The collection is as follows:

Full Figure—The Diadumenos (British Museum); the Doryphoros (Naples). These two figures are full size.

The following figures are reduced mathematically: the Discobolus; the Venus of Milo; the Slave of Michel Angelo; the Achilles; the Fighting Gladiator (Louvre); and Houdon's Anatomical Figure.

Busts and Heads—Asiaticus (Paris); Brutus (Rome, the Capitol); Cato (Rome, the Vatican); Cicero (Rome, the Capitol); Dante (Florence, Uffizi); Agrippa (Louvre); Venus (Vatican); A Centurion (Naples); Ariadne (the Capitol); Psyche of Naples (Naples); a Vestal (Vatican); Niobe (Vatican); the Two Daughters of Niobe (Florence).

Among the old busts are the Apollo Belvidere, the Antinous, Bacchus, Juno, Mercury, Demosthenes, etc.

Besides there is a complete set of decorative and architectural ornaments, taken from monuments of antiquity, the Middle Ages and the Renaissance, and of elements of the human figure (hands, feet, etc.) from the antique, and some anatomical pieces.

ELEMENTARY CLASS.

I.

(*a*) Drawing from casts of ornaments purely geomettrical, such as mouldings, ovoloes, dentels, etc. Sketching from simple objects.

(*b*) Drawing from casts of ornaments of which the elements are living forms, such as ornamental leaves and flowers. Sketching from nature, leaves and flowers.

(*c*) Drawing from architectural elements, such as pedestals, bases, shafts, cornices, etc. Lectures on perspective, direction of the principal lines in relation to the horizon. Elementary notions of the five orders of architecture.

(*d*) Drawing from casts of the human figure: hands, feet, masks, etc. Architectural ornaments. Sketching from familiar objects.

ANTIQUE CLASS.

II.

(*a*) Drawing from the antique of heads and busts. Still life drawing. Sketches of landscapes from nature. Selection of a subject. Composition in landscape. Applications of perspective.

(*b*) Drawing from the antique, full figure. Occasional studies of the head from the living model. Sketching from the costumed model. Still life in water colors. History of art.

III.

Life Class—Drawing from life. Artistic anatomy. Anatomical studies from the collections of Science Hall. Still life painting in water colors and oil. Landscape painting. Drawing for illustration.

IV.

Sketch Class—One hour a week. This class is open also to the students in the Mechanical Drawing classes. The students have themselves an organization, "The Crayon Club," the object of which is to sketch college scenes and to do illustrative work: these sketches are brought into class and criticized.

V.

Modelling—An entire week in the spring terms of the Sophomore, Junior and Senior years in Architecture is devoted to modelling in clay. The objects modelled are architectural forms, copied from the casts or made from the student's drawings of his own work, as his progress and ability may warrant.

VI.

Class of Decorative Design—The object of this department is to prepare students for professional work in decorative designings of all kinds. They will take up the study of historical ornaments and will be taught the several principles of the arrangement of designs, and from personal sketches of plants aud flowers will be shown the art of making original designs for wall paper, book covers, stained glass, carpets, interior decorations, metal plates, etc. No particular programme is given out as the teaching is purely individual.

COURSES IN MUSIC.

FIRST YEAR.

I.

Violin—Studies by Wichtl, Ries, Mazas, Kreutzer, Fiorillo. Compositions by Dancla, DeBeriot, Sitt.

II.

Pianoforte—Kœhler's and Damm's *Piano School.* Studies by Lœschorn, Berens, Czerny, Helier. Sonatinas and easy sonatas by Clementi, Haydn, Reinecke and Mozart. *Jugend album* and *Kinderscenen* by Schumann.

III.

Voice-Production — Tone placing. Diaphragmatic breath-control. Articulation. Text-books, Shakespeare's *Art of Singing. Part I.;* Kofler's *Art of Breathing*; *Studies* by Bassini; English Songs.

Vocal Sight Reading—Elementary Theory of Music. Intervals, and Ear-Training. Choir Practice.

IV.

Organ—Rink's *Organ School.* Eugene Thayer's *Studies. Light Preludes and Fugues* by Bach.

SECOND YEAR.

Ia.

Violin—Studies by Rode, Schradieck, Dont. Sonatas and pieces by Tartini, Bach, Beethoven, and Mozart.

IIa.

Pianoforte—Studies by Czerny, Heller, Hasert, Lecouppy, Cramer and Krause. Octave studies by Turner. Bach's Preludes, Fugues and Inventions. Sonatas and

pieces by Mozart, Haydn, Beethoven, Mendelssohn, Schumann and Schubert.

IIIa.

Voice-Production — Advanced Breathing Exercises. Study of the Chest and Falsetto registers. Stroke of the Glottis. Text-books, Shakespeare's *Art of Singing*, *Parts II.* and *III.*; Studies from Italian Operas; French and English Songs.

Vocal Sight Reading — Phrasing, punctuation and advanced study. Practice in Operatic Chorus-work.

IVa.

Organ — Schneider-Warren's *Pedal Studies*. Easy sonatas by Mendelssohn, Merkel, Rheinberger. Preludes and Fugues by Bach. *Twenty Studies* by Whiting. *Canonic Studies* by Chadwick.

V.

Harmony — Construction and use of chords. Harmonization of melodies. Harmonizing from figured bass. Text-books, Gœtschius' *Tone Relations*. Logier's *Harmony*.

THIRD YEAR.

Ib.

Violin — Sonatas by Bach. Studies by Schradieck-Alard, Wieniawski. Concertos and pieces by Spohr, Vieuxtemps, Mendelssohn, Dvorak.

IIb.

Pianoforte — *Gradus ad Parnassum*, Clementi-Tausig. *Das Wohl Temperirte Klavier* by Bach. *English and French Suites* by Bach. *Etudes* by Haberbier and Henselt. Sonatas, concertos and pieces by Beethoven, Weber, Mendelssohn, Chopin, Schubert and Grieg.

IIIb.

Voice-Production—Study of Trill, Mordent, Gruppetto, etc. *Messa di Voce.*

IVb.

Organ—Sonatas, Preludes and *Chorale Vorspiele* by Bach. Concert pieces by Hændel, Merkel, Salome, Whiting, Best, Rheinberger.

Va.

Harmony—(Counterpoint). Simple two and four part counterpoint; double and florid counterpoint. Canon. Fugue.

FOURTH YEAR.

Ic.

Violin—Studies by Paganini. Concertos and pieces by Beethoven, Brahms, Bruch, Joachim and others.

IIc.

Pianoforte—Studies by Tausig and Chopin. Sonatas, concertos, and concert pieces by Schumann, Brahms, Rubinstein, Liszt.

IIIc

Organ—The greater Preludes, Fantasies and Fugues of Bach. Sonatas and concert pieces by Thiele, Widor, Dubois, Guilment and Saint-Saens.

IVc

Harmony—(Composition.) Construction of musical forms, i. e., the Sonata, Rondo, etc. Practical application in an original manner of these forms. Orchestration.

INSTRUMENTS.

Instruction is also given on the Viola, Flute, Piccolo, Cornet, Trombone, Guitar and Mandolin.

Opportunity is given to the advanced students of playing in the University Orchestra and Band.

THE SINGING CLASS.

There is an organization of musical students open to those only taking lessons in vocal music; the Choir and the Glee Club are selected from the members of this class.

COURSES IN CHRISTIAN DOCTRINE.

All Catholic students are obliged to attend the courses in Christian Doctrine.

FIRST YEAR.

Moral — The Articles of the Creed. The General Principles of Morality. Virtue and Sin. The Commandments of God. Text-book, *Manual of Christian Doctrine.*

SECOND YEAR.

Moral — The Commandments of the Church. The Evangelical Counsels and Beatitudes. Worship and Means of Sanctification, — Grace, Prayer, the Sacraments, Liturgy. Text-book, *Manual of Christian Doctrine.*

THIRD YEAR.

Dogma — Revealed Religion. Pre-Christian Revelation. The Christian Revelation. The Catholic Church. God Considered in Himself. Text-book, Wilmer's *Hand-book of the Christian Religion.*

FOURTH YEAR.

Dogma — God the Creator. God the Redeemer. Sanctification. Grace. The Sacraments. The Church as a Means of Salvation. Text-book, Wilmer's *Hand-book of the Christian Religion.*

Preparatory School

INSTRUCTORS IN THE PREPARATORY SCHOOL.

REV. WILLIAM MARR, C. S. C.,
Christian Doctrine.

REV. JOSEPH J. GALLAGHER, C. S. C.,
Latin.

REV. THOMAS H. CORBETT, C. S. C.
Mathematics.

REV. MICHAEL M. OSWALD, C. S. C.,
Greek.

REV. MATTHEW A. SCHUMACHER, C. S. C.,
English and History.

REV. JAMES J. TRAHEY, C. S. C.,
Latin.

REV. TIMOTHY MURPHY, C. S. C.,
Christian Doctrine.

BRO. ALEXANDER, C. S. C.,
Mathematics.

BRO. PHILIP NERI, C. S. C.,
Penmanship.

BRO. CYPRIAN, C. S. C.,
Bookkeeping, Phonography, Typewriting.

WILLIAM L. BENITZ, M. E., E. E.,
Mathematics.

EDWARD J. MAURUS, M. S.,
Mathematics.

SHERMAN STEELE, LITT. B., LL. B.,
English and Civics.

CHARLES PETERSEN, A. M.,
German.

ALPHAEUS B. REYNOLDS, A. B.,
Latin and English.

WILLIAM J. MAHONEY, A. B., LL. B.,
Mathematics.

JOHN QUINLAN, A. B.,
English and Mathematics.

MICHAEL J. SHEA, A. M.,
Latin and Greek.

THOMAS JAMES DEHEY, A. M.,
French and English.

JOHN B. RENO, A. M., LL. B.,
History and English.

TERENCE B. COSGROVE, A. B., LL. B.,
Mathematics and Astronomy.

JOHN J. MARONEY,
English, Geography and History.

JOHN WORDEN, B. S.
Drawing.

GALLITZEN A. FARABAUGH, A. B.,
History and English.

CLARENCE J. KENNEDY, B. S.
Physiology, Zoology, Botany.

EDWARD H. SCHWAB, LL. M.
Commercial Law.

HENRY M. KEMPER, A. M.
Latin and English.

ARTHUR S. FUNK, B. S.
Chemistry.

MAURUS J. UHRICH, C. E.,
Physics.

THE PREPARATORY SCHOOL.

The University maintains a fully equipped Preparatory School under the same general government as the Colleges, but having its own special corps of instructors. The schedules of studies are arranged to meet the need of thorough preparation for collegiate work, and embrace courses which, while giving as wide an education as can be obtained in the very best High Schools, prepare students directly for the group of studies they may elect when entering the Freshman year. Five different programs of instruction are offered to students, each containing such special courses as directly meet the needs of the fifteen college groups, while all embrace common subjects which are indispensably necessary in acquiring a fairly liberal education. The period of instruction covers four years.

The equipment and facilities for study in the Preparatory School are most complete. The laboratories are extensive and fully supplied with the latest improved appliances. The classes pursuing any subject are divided into sections, each containing a limited number of students. The sections are purposely limited in order that each student may receive close attention from the instructor in every recitation and laboratory period.

Examinations for admission are held at the opening of the School in September and embrace the subjects completed in the highest grade in the Grammar School. The expenses for tuition, board, laundry, etc., and for special courses not listed in the programs will be found on pages 33, 34. The following fees are special to the Preparatory School;

LABORATORY FEES.

Science C.—Elementary Botany	$ 2.50
Science D.—Elementary Zoology	2.50
Science E I.—Elementary Chemistry	2.50
Science F I.—Elementary Physics	2.50
Science E. II.—Elementary Chemistry	5.00
Science F. II.—Elementary Physics	5.00

Studies Preparatory for the Department of Classics in the College of Arts and Letters.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
Latin - - -	5	A	Latin - - -	5	A
English - -	5	A	English - -	5	A
History - -	3	A	History - -	3	A
Mathematics -	5	A	Mathematics -	5	B
Science - -	5	B	Science - -	5	D

SECOND YEAR.

Latin - - -	5	B	Latin - - -	5	B
Greek - - -	5	A	Greek - - -	5	A
English - -	5	B	English - -	5	B
History - -	3	B	History - -	3	B
Mathematics -	5	C	Mathematics -	5	D

THIRD YEAR.

Latin - - -	5	C	Latin - - -	5	C
Greek - - -	5	B	Greek - - -	5	B
English - -	5	C	English - -	5	C
History - - -	3	C	History - -	3	C
Mathematics -	5	E	Science - -	5	C
Civil Gov'm't	2	A	Civil Gov'm't	2	A

FOURTH YEAR.

Latin - - -	5	D	Latin - - -	5	D
Greek - - -	5	C	Greek - - -	5	C
English - -	5	D	English - -	5	D
German or French	5	A	German or French	5	A
Science - -	5	EI	Science - -	5	FI

Studies Preparatory for the Department of Letters and the Department of History and Economics in the College of Arts and Letters.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
Latin - - -	5	A	Latin - - -	5	A
English - - -	5	A	English - -	5	A
History - -	3	A	History - -	3	A
Mathematics -	5	A	Mathematics -	5	B
Science - - -	5	B	Science - -	5	D

SECOND YEAR.

Latin - - -	5	B	Latin - - -	5	B
French or German	5	A	French or German	5	A
English - - -	5	B	English - -	5	B
History - - -	3	B	History - - -	3	B
Mathematics -	5	C	Mathematics -	5	D

THIRD YEAR.

Latin - - -	5	C	Latin - - -	5	C
French or German	3	B	French or German	3	B
English - -	5	C	English - -	5	C
History - - -	3	C	History - -	3	C
Mathematics -	5	E	Science - - -	3	C
Civil Gov'm't -	2	A	Civil Gov'm't	2	A

FOURTH YEAR.

Latin - - -	5	D	Latin - - -	5	D
French or German	2	C	French or German	2	C
English - -	5	D	English - -	5	D
German or* French	5	A	German or French	5	A
Science - -	5	EI	Science - - -	5	FI

* Students who begin French A in the second year must begin German A in the fourth year.

Studies Preparatory for the College of Science.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
English - - -	5	A	English - - -	5	A
Mathematics -	5	A	Mathematics -	5	B
Latin - - -	5	A	Latin - - -	5	A
Civil Gov'm't -	2	A	Civil Gov'm't -	2	A
Science - - -	5	A	Science - - -	5	D

SECOND YEAR.

English - -	5	B	English - -	5	B
Mathematics -	5	C	Mathematics -	5	D
History - - -	3	A	History - - -	3	A
Science - -	5	B	Science - - -	5	C
Latin - - -	5	B	Latin - - -	5	B

THIRD YEAR.

English - - -	5	C	English - -	5	C
Mathematics -	5	E	Mathematics -	5	F
German - - -	5	A	German - -	5	A
Science - - -	5	EII	Science - -	5	EII
History - - -	3	B	History - - -	3	B

FOURTH YEAR.

English - -	5	D	English - - -	5	D
German - -	3	B	German - -	3	B
Science - - -	5	FII	Science - - -	5	FII
Science - - -	2	G	Science - - -	2	G
History - - -	3	C	History - - -	3	C
Drawing - -	3	A	Drawing - -	3	B

General Science students shall take Trigonometry in the fourth year instead of German B.

Biological students shall take four hours of Drawing in the second term of the third year instead of Mathematics F.

Studies Preparatory for the College of Engineering.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
English - -	5	A	English - -	5	A
Mathematics -	5	A	Mathematics -	5	B
History - - -	3	A	History - - -	3	A
Science - - -	5	A	Science - - -	5	D
Civil Gov'm't	2	A	Civil Gov'm't	2	A

SECOND YEAR.

English - -	5	B	English - -	5	B
Mathematics -	5	C	Mathematics -	5	D
History - - -	3	B	History - - -	3	B
Science - - -	5	B	Science - - -	5	C
German - -	5	A	German - -	5	A

THIRD YEAR.

English - -	5	C	English - -	5	C
Mathematics -	5	E	Mathematics -	5	F
German - -	3	B	German - -	3	B
Science - - -	5	EII	Science - - -	5	EII
History - - -	3	C	History - - -	3	C

FOURTH YEAR.

English - -	5	D	English - -	5	D
Mathematics -	5	G	Mathematics -	5	H
Drawing - -	3	A	Drawing - -	3	A
Science - - -	5	FII	Science - - -	5	FII
Science - - -	2	G	Science - - -	2	G

PREPARATORY COURSES.

COURSES IN LATIN.

A.

Grammar — Etymology, *Bennett.*
Exercises — Rudiments of Latin, *Reynolds.*
[Five hours a week for two terms.]

B.

Grammar — Review of Etymology, Syntax, *Bennett.*
Caesar — Books I.–IV.; or Junior Latin Book.
Prose Composition — Based on Caesar.
[Five hours a week for two terms.]

C.

Grammar — Syntax, *Bennett.*
Nepos — Selected Lives.
Sallust — Catiline.
Cicero — Orations I.–III., Against Catiline.
Prose Composition — Based on Authors read.
[Five hours a week for two terms.]

D.

Grammar — Complete Review.
Cicero — Three Orations, including Pro Lege Manilia.
Ovid — Metamorphoses.
Vergil — Aeneid, Six Books. The explanations cover peculiarity of Syntax, Figures, Mythology.
Prosody — Study of Hexameter Verse.
Prose Composition — Based on Cicero.
[Five hours a week for two terms.]

COURSES IN GREEK.

A.

Grammar — Etymology, *Goodell.*
Lessons for Beginners — *Morrison and Goodell.*
Epitome of the New Testament — Part I., *Stoffel.*
[Five hours a week for two terms.]

B.

Grammar — *Goodell* — Etymology reviewed and Syntax begun.
Xenophon — Anabasis, Four Books, *Smith.*
Compositions — Based on the Anabasis.
Epitome of the New Testament — Part II., *Stoffel.*
[Five hours a week for two terms.]

C.

Grammar — Completed.
Xenophon — Selections from the Memorabilia.
Prose Composition —
Homer — *Iliad* — Six Books — *Seymour.*
Epitome of the New Testament — Part III., *Stoffel.*
[Five hours a week for two terms.]

COURSES IN ENGLISH.

A.

(*a*) Meiklejohn's *Art of Writing English*, with daily exercises in class. Two themes a week.

(*b*) The elements of versification. Scansion, one hour a week. Weekly exercises in writing verse. Memory work.

(*c*) Required reading: *Robinson Crusoe*, **Evangeline*' *Treasure Island*, *Snow-Bound*, **The Sketch Book*, **The Vision of Sir Launfal*, Poe's *Tales*, Poe's *Poems*, *Fioretti*, **Julius Caesar*, **The Merchant of Venice*,

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

B

(*a*) Hill's *Principles of Rhetoric.* Part I., with daily exercises in class. Two themes a week.

(*b*) The simpler verse-forms. Weekly exercises.

(*c*) Required reading: *Ivanhoe*, **The Lady of the Lake*, **The Vicar of Wakefield*, **The Ancient Mariner*, *The Courtship of Miles Standish*, **Silas Marner*, **The Princess*, **Macbeth*, **As You Like It.*

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

C.

(*a*) Hill's *Principles of Rhetoric*, Part II., with daily exercises in class. Weekly theme first term; fortnightly essay second term.

(*b*) Verse-forms continued. Weekly exercises. Memory work.

(*c*) Required reading: *Sir Roger de Coverly, *Macaulay's Essay on Addison, **The Golden Treasury of English Lyrics*, *Macaulay's Essay on Milton, *Milton's Minor Poems, **A Midsummer Night's Dream*, *Burke's Speech on the Conciliation of America, *Webster's Bunker Hill Oration, *Lincoln's Gettysburg Oration, **King Lear.*

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

D

(*a*) Genung's *The Working Principles of Rhetoric*, Part I., with daily exercises in class. Fortnightly essay first term; monthly essay second term.

(*b*) Verse-forms concluded. Weekly exercises. Memory work.

(*c*) Required reading: *The House of the Seven Gables*, **The Idyll's of the King*, Selections from *Paradise Lost*, Cary's Dante, *Gates' *Selections from Newman*, **The Dream of Gerontius*, Pope's Homer, **The Tempest*, Aubrey de Vere's Poems, **Hamlet.*

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

COURSES IN FRENCH.

A.

Grammar with written and oral exercises; the inflection of nouns and adjectives, the use of all the pronouns, the conjugation of regular and the common irregular verbs; the correct use of moods and tenses, the essentials of French syntax, and the common idiomatic phrases. Reading three of the following: Houghton's *French by Reading*, La Tâche du Petit Pierre (*Mairet*), Un Cas de Conscience (*Gervais*), La Main Malheureuse (*Guerber*), Sans Famille (*Malot*), Super's *Readings from French History*.

[Five hours a week for two terms.]

B.

Advanced grammar and composition, study of idioms, memorizing. Dictations and conversations are added on

practical topics, and careful translation made of two or three of the following works: Le Voyage de M. Perrichon (*Labiche*), Roman d'un Jeune Homme Pauvre (*Feuillet*), Fables choisies (*La Fontaine*), Le Médecin Malgré Lui (*Molière*), Le Cid (*Corneille*), Esther (*Racine*), Pages oubliées de (*Chateaubriand*), La Question d' Argent (*Dumas*), Standard French Authors (*Guerlac*).

[Three hours a week for two terms.]

C.

The study of this course is devoted chiefly to the prose and poetry of the nineteenth century and includes composition, conversation, history and general view of French literature. Besides a reading and criticism of the best writers, such as: Causeries du Lundi (*Ste. Beuve*), On Rend l' Argent (*Coppée*), Hernani (*Hugo*), Méditations (*Lamartine*), Athalie (*Racine*), L'Avare (*Molière*), Mlle. de la Seiglière (*Sandeau*), Les Origines de la France Contemporaine (*Taine*), Expédition de Bonaparte en Egypte (*Thier*), Ste. Elizabeth de Hongrie (*Montalembert*), Histoire de la Littérature Française (*Duval*).

[Two hours a week for two terms.]

N. B.—The works studied are not necessarily the same every year.

COURSES IN GERMAN.

A.

Grammar, *Joynes-Meissner*, Part I. Translation from German into English of simple prose; translation of English exercises into German. Reading of short stories and selections from more difficult prose.

German Reader, *Miller and Wenkelbach.*

[Five hours a week for two terms.]

B.

Grammar, *Joynes-Meissner*, Part II. Translation into German of narrative prose and selections from history. Sight reading of selections from history.

Herman and Dorethea (*Goethe*); Lichtenstein (*Hauff*).

[Three hours a week for two terms.]

C.

Grammar, *Joynes-Meissner*, Part III. Sight reading of plays, poems and prose writings. Translations of selections from history and literature; original essays.

Minna von Barnhelm (*Lessing*); Best known poems (*Heine*); Correspondence (*Schiller-Goethe.*)

[Two hours a week for two terms.]

COURSES IN HISTORY.

A

Ancient History—Fisher's *Outlines* of *Ancient History.* The Oriental Nations. The History of Greece and of the Empire of Alexander. The Story of Rome. The Establishment of the Empire, and the Rise of Christianity.

[Three hours a week for two terms.]

B.

Medieval History—Fisher's *Outlines* of *Medieval History.* The Barbarians and their Kingdoms. Mahommedanism and the Saracen Caliphs. The Holy Roman Empire. The Invasion of the Northmen and the Ma-

gyars. The Empire and the Papacy. The Crusades. The Great Schism and the rise of the nations of Modern Europe.

[Three hours a week for two terms.]

C.

Modern History—Fisher's *Outlines* of *Modern History*. The Renaissance. The Ages of Discovery. The Protestant Reformation. The Power of Spain. The Strifes of France with Spain and Germany. The Ages of Louis XVI., and the rise of Russia. The Spanish and Austrian Successions. The Empire of England. The American Revolution. The French Revolution and the Wars of Napoleon. The Revolutions and the Spirit of Nationality. The Formation of Germany and Italy.

[Three hours a week for two terms.]

COURSE IN CIVIL GOVERNMENT.

A.

This is a study of the science of government in connection with American institutions, and is intended to give the student some knowledge of the general principles of government and the American Constitution. The subject begins by defining government; then is considered the object and necessity of government; origin of civil society; the principle of suffrage; different forms of government defined and compared; theories of representation. These topics necessarily are treated briefly, as the principal part of the course consists of a study of the Colonial governments, the Articles of Confederation and their defects, the formation of the Constitution and

its adoption. The study likewise comprises a critical analysis of each article and section of the American Constitution, thus enabling the student to acquire a clear conception of the division of powers of the National Government and the duties and responsibilities of each department. Text-book, *Government by State and Nation*, by James and Sanford.

[Two hours a week for two terms.]

COURSES IN MATHEMATICS.

A.

Algebra — This course for beginners in Algebra includes a study of the primary fundamental principles necessary to the courses which follow. The subjects dwelt upon in particular are Factoring, Highest Common Factor and Least Common Multiple, which are afterward applied in their relation to Fractions and the reduction of Complex Fractions. In as far as possible, concrete examples of their applications to kindred scientific subjects are supplied by the teacher. Text-book, *Wentworth.*

[Five hours a week for one term.]

B.

Algebra — In this course the study of Equations is begun and continued through equations of the first degree. Fractional Equations, Systems of Simultaneous Equations, Involution, Evolution, Radicals and Exponents complete the course which is supplemented wherever possible with problems of practical application. Text-book, *Wentworth.*

[Five hours a week for one term.]

C.

Algebra—This course begins with Quadratic Equations, Pure and Affected, followed by Systems of Simultaneous Quadratic Equations and those forms of Radical Equations of Higher Degree which may be solved by quadratic methods. Ratio and Proportion, Indeterminate Equations, Surds, Imaginaries, Inequalities, the Progressions and the Binomial Theorem finish the work in this course. As in the preceding courses, special stress is placed upon the application of the theory to such examples as will show its application to the elementary scientific subjects. Text-book, *Wentworth.*

[Five hours a week for one term.]

D.

Geometry—This subject is completed as far as the end of Plane Geometry and includes a study of the theorems with proofs of exercises and original propositions. The habit of independent thinking is cultivated to some extent by the solution of special problems to concrete nature intended to exhibit the relation of the process studied to practical examples. Text-book, *Wentworth.*

[Five hours a week for one term.]

E.

Geometry—The study of Solid Geometry is taken up after Course D., the course being an extension of that of the preceding term. Planes, Solid Angles, Polyhedrons, the Cylinder, Cone and Sphere are all studied in detail and the solution of original exercises and propositions of application is made a feature of the course. Text-book, *Wentworth.*

[Five hours a week for one term]

F.

Algebra and Geometry—This course which continues through one scholastic year is designed especially for those students who wish to take up the study of Engineering. As this necessitates a thorough ground work in mathematics, the first half of the year is given to a review of Algebra and Geometry, three hours and two hours per week respectively. The most important theorems and subjects are again studied and a more comprehensive view of the subject is attained in the generalizing of many theorems and extending the range of others. Text-book, *Benitz*.

[Five hours a week for one term.]

G.

Algebra and Geometry—The work of this course is entirely given up to an elementary exposition of the application of mathematics to scientific problems and to analysis. In lectures and class work actual problems representing existing and practical conditions will be taken up, and the derivation of approximate formulæ and an elementary study of curves derived from experiment are included. Text-book, *Benitz*.

[Five hours a week for one term.]

H.

Trigonometry—A half a year is given to this subject which includes both Plane and Spherical Trigonometry. The work done is the equivalent of that in most of the elementary text-books. Special attention is given to Goniometry on account of its application to Calculus, and examples of a concrete nature are abundantly supplied. Text-book, *Wentworth*.

[Five hours a week for one term.]

COURSES IN SCIENCE.

A.

Physical Geography — An introductory and elementary study of the earth and its environments. The student will be led into a closer sympathy with the world about him. The various types of plant and animal life together with topographical and climatic conditions are considered. Text-book, *Tarr*.

[Five hours a week for one term.]

B.

Physiology—Lectures, recitations and demonstrations with the stereopticon. The study of the human skeleton including the physiology and hygiene of the bones. The action, relation, structure and hygiene of muscles. The digestive, circulatory and excretory systems demonstrated by models and charts. The anatomy and structure of the nervous system and simple experiments on the same. Text-book, *Martin*.

[Five hours a week for one term.]

C.

Elementary Botany — A course for beginners in this subject; it includes a study of the higher plants with reference to structure of root, stem, leaf, flower and seed. An introduction to the lower forms of plant life and their classification is also given. Text-book, Bastin's *Elements of Botany*.

[Five hours a week for one term.]

D.

Elementary Zoology —Includes an introduction to the subjects with studies of representative forms and

their classification in the different groups of the animal kingdom. The subject is taught by recitations and laboratory work. Text-book, *Chapin aud Rettger.*

[Five hours a week for one term.]

E I.

(*a*) **Elementary Chemistry** — A course in the elements of chemistry designed to meet the requirements in the College of Arts and Letters. Lectures and recitations. Text-book, *Remsen.*

[Four hours a week for one term.]

(*b*) A laboratory course of fifty experiments to accompany (*a*).

[One hour (two hours of actual work) for one term.]

E II.

(*a*) **Elementary Chemistry**— An introductory course of experimental lectures on familiar subjects such as water, the air and its constituents, common salt, etc., leading up to discussions of the more important elements and their properties, and the fundamental laws and phenomena of Chemistry. Text-book, *Newell.*

[Three hours a week for two terms.]

(*b*) **Experimental Chemistry** — A laboratory course to accompany Course (*a*). A series of one hundred exercises to be performed by each student, and having as their main object the cultivation of the student's powers of observation and faculty of inductive reasoning. These exercises comprise a study of the principal metallic elements, including their preparation, properties and more familiar compounds. The directions for each experiment are made as brief as possible, the observation of facts and the drawing of correct conclusions therefrom being left, so far as the nature of the experiment will permit, to the student.

[Two hours (four hours of actual work) a week for two terms.]

F I.

(*a*) **Elementary Physics**—A course in which the divisions of the subject are considered briefly, suited to the requirements of the College of Arts and Letters. Lectures and recitations. Text-book, *Carhart and Chute.*

[Four hours a week for one term.]

(*b*) Laboratory work to accompany (*a*).

[One hour (two hours of actual time) a week for one term.]

F II.

(*a*) **Elementary Physics**—Instruction in Elementary Physics is given by lectures and recitations in which the general laws of Mechanics, Heat, Acoustics, Optics, Electricity and Magnetism are presented. The course is intended to meet the needs of those who desire a general knowledge of the subject, as well as to lay the foundations for advanced work. Particular attention is paid to the correct statement of principles, so that in his advanced work the student will have nothing to unlearn or relearn. Text-book, *Carhart and Chute.*

[Three hours a week for two terms.]

(*b*) **The Laboratory Work** of this course consists of a series of experiments which verify and apply practically the fundamental principles of Physics. The student also receives instruction in the use and careful handling of apparatus, accurate observation, and correct deduction of results. Neat and concise reports of all experiments are kept by each student and form the basis for the grades in his work.

[Two hours (four hours of actual work) each week for two terms]

G.

Astronomy, Descriptive—This course is intended to

give students as much knowledge of astronomical facts as can be obtained with only an elementary training in mathematics. The study consists of a description of the earth, its form, size, density and motion; a study of the moon and her motions; the sun and its relation to the earth: an account of eclipses, refraction and aberration of light. A description of the planets, their distances, dimensions, and physical conditions; a study of parallax, diurnal and annual; an account of meteors and comets. A study of the stars and constellations; instruction is given to enable students to name and locate the more prominent. The subject of Cosmogony is considered briefly as well as an explanation of the different systems of Astronomy. The subject is given both by lectures and text-book. Text-book, *Young's Lessons in Astronomy*.

[Two hours a week for two terms.]

COURSES IN DRAWING.

A.

This course is based on the rudiments of drawing and consists of the training necessary for the hand and the eye. Sketching is also done from simple objects of various forms.

[Three hours a week for one term.]

B.

Advanced work in sketching from objects such as the plaster cast of flowers and suitable ornaments which afford the study of light and shade.

[Three hours a week for one term.]

GRAMMAR SCHOOL WORK.

The Courses of the Preparatory School outlined above are equivalent to those of a High School. There is also a Junior Preparatory Department in which are taught all the branches of a Grammar School,—the students have every opportunity of preparing themselves as rapidly as possible for High School work.

Commercial School.

THE COMMERCIAL SCHOOL.

When the character and needs of the country are considered, courses in business will appear the most practical, and among the most important that an educational institution can offer.

Students therefore, who have not the time or the means to take a complete college course in the Classics or Sciences, would do well to enroll themselves in the Commercial School. No plan of study is more injudicious than a haphazard selection of such studies as an inexperienced young man may fancy. The training resulting from a fixed program of studies is of the utmost benefit to the student.

The commercial studies at Notre Dame have always received the most careful attention from the officers and from the Commercial Faculty. Notre Dame claims to give the students of this School a more complete business training than can be obtained in any purely commercial school. The authorities require that students taking this program—which may be completed in one year—should be at least 16 years of age and should have completed two years of a regular High School course or its equivalent. Special arrangements, however, will be made for young men who have had no High School training, but who may have had practical business or or office experience. Should a student desire to pursue any other studies in which he may be interested, and for which he has time, he will have liberty to do so.

PROGRAM OF INSTRUCTION

FIRST TERM.

I.

Arithmetic—Percentage; Ratio and Proportion; as far as Involution and Evolution. Normal Union Arithmetic, *Brooks*. Recitations daily.

II.

Bookkeeping—Preparatory instruction and definitions; Initiatory Sets by Double Entry; Retailing by Double Entry; special practice in writing Business Paper and Business forms. New complete Bookkeeping, *Williams and Rogers*. Recitations daily.

III.

Business Practice and Office Work—Daily after first two months in Course II. above.

IV.

English—Study of the theory of English Composition; frequent exercises in Theme Writing. The principles of Rhetoric. Recitations daily.

V.

Phonography*—Recitations daily.

VI.

Typewriting—Three hours a week.

VII.

Penmanship.

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*Phonography free to commercial students in the final year of their course. For typewriting fees see page 34.

SECOND TERM.

I.

Arithmetic — Percentage, Ratio and Proportion (reviewed); Involution and Evolution; Arithmetical and Geometrical Series; Higher Percentage; Mensuration; Arithmetical Analysis. Higher Arithmetic, *Brooks*. Recitations daily.

II.

Bookkeeping — Single Entry; changing Single to Double Entry; Retailing; Wholesaling; Shipping and Commission; Jobbing; Manufacturing; Installment and State Agencies; Joint Stock Companies; Banking; Railroading. New Complete Bookkeeping, *Williams and Rogers*. Three hours a week.

III.

Business Practice and Office Work — Four hours a week.

IV.

Business Correspondence — One hour a week.

V.

Commercial Law — General principles of Contracts; Agency; Partnership; Corporations; Guaranty; Sale of Goods; Negotiable paper. *Richardson*. Two hours a week.

VI.

Phonography — Speed Class. Recitations daily.

VII.

Typewriting. Speed Class. Three hours a week.

VIII.

Penmanship.

School for Minims.

THE SCHOOL FOR MINIMS.

For the care and training of boys under the age of thirteen years, there has been established a department to which the most scrupulous attention has always been paid by the authorities,—it is known as the School for Minims.

Thorough and comprehensive instruction in all the elementary branches of an English education is here imparted, together with a rudimentary knowledge of Latin, French and German. Vocal Music and Drawing involve no extra charge. The pupils of this department are taught by Sisters of the Holy Cross.

DISCIPLINE.

The following is the order of the day: Rising at 6:30 a. m., toilet, etc.; seven, breakfast, after which there is a short time given to exercise on the campus; eight, study; half-past nine, luncheon; ten, classes and study; a quarter to twelve, toilet; twelve, dinner, followed by recreation; half-past one, classes and study; three, recreation and luncheon; half-past four, classes and study; a quarter past six, toilet; half-past six, supper and recreation; half-past eight, retiring. From this it may be seen that while the Minims devote less than seven hours a day to study, they are never more than two hours in succession in the class-room. The recreation and exercise in the fresh air after each period of study, unbend the mind and prepare the boys to return to their classes refreshed and ready for work.

The Minims are always under supervision during the hours of recreation as well as in the class-room and the study-hall. The presence, however, of the prefect, is far from being a restraint on the amusement of the boys;

for while it is the duty of the prefects to insist that their young charges shall always keep within the limits of the strictest propriety, they, at the same time, take part in all sports, organize games, and do everything in their power to foster the love for exercise. The play-ground is a broad, level, eight-acre field, well supplied with turning poles, swings, ladders, rings, parallel bars, and all other necessary gymnastic apparatus. That the boys make good use of them can be seen from their healthy, happy appearance, which invariably attracts the notice of visitors. Connected with the play-ground is a brick play-hall, 160 feet long and heated by steam. In this hall the boys play in rainy or cold weather.

The sisters preside at the toilet; they clean and mend the clothing; see to all the needs and to the comfort and convenience of the Minims. Baths are taken every few days. Underclothing is changed regularly. Great care is taken that the boys be neatly dressed, and that the clothing be suitable for the season.

SOCIETIES.

There are two societies in the Minim Department; that of the Guardian Angels or the Sanctuary, which has for its object to supply servers for the Church services, and the Sorin Association, which has been established with a view to give the pupils a start, as early as possible, in elocution. The society is presided over by one of the professors, who finds it a pleasant duty to draw out the talent of these interesting young orators. Meetings are held once a week, after school hours. These meetings are a source of pleasure as well as of profit. The members prepare original compositions, deliver declamations, are trained to debate, etc. Only the best behaved and more advanced in studies are admitted to membership. To encourage this young literary society, a Gold Medal

for Elocution is annually awarded at Commencement to the most deserving member.

GENERAL REMARKS.

The discipline to which the Minims are subjected is much milder than that which is suited to students more advanced in age. Recourse is scarcely ever had to punishment. Those in charge endeavor to govern by kindness and gentleness, and by appealing to the boys' sense of honor. The names of all whose conduct and application to studies are satisfactory appear on the Roll of Honor and on the Roll of Class Honors. To find his name mentioned in these rolls, is found to be as great a reward for the deserving pupil, as its non-appearance is a punishment for the undeserving.

Then, too, there is a Gold Medal awarded at the end of two full years to those whose deportment has been unexceptionable during that period. As this fact is made known to the Minim immediately after his entrance, he generally endeavors to shape his conduct with a view to receiving an Honor. The greatest care is taken to form their young hearts to habits of virtue, and to inculcate the practice of refined manners. Every effort is made to foster respect and affection for parents, to whom they are expected to write at least once a week.

Not the least of the advantages enjoyed by the Minims is their complete separation from the order students. A commodious building, known as St. Edward's Hall. affording ample accommodations for over one hundred pupils, is devoted to their use. It is four stories in height, one hundred and fifty feet long, and forty-five feet wide, heated by steam, supplied throughout with the Edison incandescent electric light, and provided with hot and cold water. The ceiling in the study hall, class-rooms and sleeping appartments is fifteen feet high. The

windows are large and numerous, affording abundant light and ventilation. The Study-hall commands a charming view from each of its eleven large windows. It is tastefully decorated with statuary, pictures, plants, etc. Beside the pleasure the Minims derive from studying in this bright, cheerful hall, their tastes are cultured by coming into contact with objects so refining. Fronting the building is a handsome park, which, with its fountains, rare trees and flowers, adds not a little to the beauty of St. Edward's Hall, as well as to the happiness of its pupils.

These remarks, which have been made to satisfy parents and others who frequently write for more detailed information, will show that, while the Minims have every advantage to aid them in acquiring a foundation for future study, they have a home, where they enjoy the same ease and freedom that they would enjoy under the care of their mothers. For further information regarding the School for Minims apply for a special catalogue.

EXPENSES.

(For Students under Thirteen Years of Age.)

Matriculation Fee (first year only)	$ 10.00
Tuition, Board, Washing, Mending, Bed and Bedding, etc., per session of nearly ten months	250.00

Payable in advance as follows :

FIRST PAYMENT,—On Entrance in September :

Matriculation Fee	$ 10.00
Board and Tuition	150.00
Deposit on Book and Stationery Account	5.00
Gymnasium	2.50
Lecture and Concert Course Ticket	1.00

Music (optional). For rates see below.

SECOND PAYMENT,—On January 15th:

Balance on Board and Tuition	$100.00

The charge per session of ten months for Piano lessons, and the use of instrument in this department is $35; for Violin, Guitar or Mandolin, $20.

Pupils who remain during the two Summer Vacation Months are charged $40.

Accounts are subject to sight draft, without notice, if not paid within ten days after they have been rendered.

Each pupil requires six shirts or waists, four suits of underwear, three night shirts, twelve pocket handkerchiefs, six pairs of stockings, six towels, two hats or caps, two pairs of shoes, a pair of overshoes, three suits of clothes, an overcoat, toilet set, blacking brush, soap, and a hand mirror. This direction concerning clothing is a suggestion, not a regulation. Any of the above supplies can be procured through the Students' Office at the University.

List of Students

LIST OF STUDENTS.

Matriculating during the Scholastic Year from September 1905 to June 1906.

Ansoategui, Santiago H.....Puerto Rico
Amell, William.....Illinois
Aronowiski, Casimer J.....Indiana
Anderson, Robert E.....Ohio
Altgelt, Herman E.....Texas
Ardner, Frank J.....Ohio
Arnold, William S.....Massachusetts
Applegate, Samuel W.....Indiana
Aligada, Orencio.....Philippine Islands
Allen, Walter H.....Illinois
Ade, C. Glen.....Indiana
Arnold, Arthur.....Illinois
Anderson, J. Clarence.....Indiana
Amadeus, B.....Indiana

Bach, James H.....Minnesota
Batlle, Evaristo R.....Spain
Bracken, Robert L.....Illinois
Beacom, Patrick A.....Iowa
Brady, James S.....Illinois
Batlle, Jose J.....Spain
Brown, Michael J.....Pennsylvania
Bosler, William N.....Kentucky
Barnett, Earl E.....Indiana
Blin, Albert.....France
Brady, James P.....Illinois
Brandell, Albert V.....Michigan
Burke, William J.....Illinois
Burke, Edmund J.....Illinois
Burns, Edward.....New York
Boyle, Joseph.....Iowa
Bolger, William A.....Michigan
Brennan, Daniel T.....Indiana
Burke, Eugene.....Illinois
Burke, Thomas.....Illinois
Brogan, John F.....Oregon

Benz, Othmar J.....Pennsylvania
Bucher, Edmund V.....Indiana
Butler, Thomas P.....Pennsylvania
Berteling, John F.....Indiana
Beckman Rafael A.....Mexico
Babbitt, Bertrand H.....Arizona
Baker, Howard S.....Michigan
Burke, Cornelius J.....Indiana
Burns, Clarence W.....Illinois
Bailey, Guy G.....Michigan
Boor, Fred T.....Iowa
Bley, Robert E.....Illinois
Berrigan, Edmund.....New York
Bannon, John M.....Pennsylvania
Bannon, Bernard A.....Pennsylvania
Burdick, Henry A.....Ohio
Bennett, George N.....Montana
Brady, Edward J.....Illinois
Brooks, William H.....Illinois
Binz, Frank.....Illinois
Blum, Raymond J.....New York
Boulton, J. Allan.....Ohio
Bonham, Edwin D.....New York
Birmingham, Joseph L.....New York
Baer, Charles A.....Iowa
Brown. Vincent J.....Minnesota
Brenneck, Charles H.....Illinois
Barry, Richard.....Illinois
Bagby, Claud A.....Colorado
Bolln, Henry J.....Wyoming
Byrns, Ashton V.....Michigan
Barsotti, Victor.....Illinois
Bloss, Richard W.....Louisiana
Benz, John J.....Pennsylvania
Barsaloux, Paul K.....Illinois
Byrne, Paul V.....Illinois
Byrne, Thomas A.....Illinois
Baumgartner, Fred N.....Indiana
Burtt, Fidelis N.....Illinois
Burtt, Millard M.....Illinois
Byrns, William N.....Michigan
Brinkmann, Clemens U. F.....Illinois

Broderick, Lester M.....Indiana
Baca, Horacio C. de.....Colorado
Baca, Alfredo C. de.....Colorado
Bunn, Edward L.....Illinois
Brady, George K.....Illinois
Bertling, Charles N.....Indiana
Bensberg, William J.....Missouri
Broad, Charles M.....Illinois
Brennan. Raymond.....Indiana
Bentley, Walter.....Illinois
Berriman, Charles S.....New York
Bensburg, Carl B.....Missouri
Burke, Edmund.....Wisconsin
Burke, Hubert.....Wisconsin

Cosgrove, Terence B.....Illinois
Canedo, Ignacio.....Mexico
Canedo, Enrique O.....Mexico
Corcoran, John J.....Michigan
Campbell, Matthew A.....W. Virginia
Coontz, J. Leo.....Missouri
Cushing, John F.....Illinois
Canedo, Alfonso L.....Mexico
Corcuerra, Javier L.....Mexico
Callaghan, Frank M.....Illinois
Corbett, James.....Illinois
Cannon, Dominic J.....Pennsylvania
Carolin, Ralph H.....Michigan
Carey, William A.....Wisconsin
Corcoran, Wendell.....Illinois
Cunningham, William.....Illinois
Carroll, Fred W.....Illinois
Corbett, John K.....Indiana
Caparo, Angel.....Peru, South America
Callicrate, Dominic L.....Indiana
Curtice, W. H.....Kentucky
Comacho, Alfonso.....Colombia, South America
Curran, Martin E.....Idaho
Corcuerra, Juan L.....Mexico
Cahill, James L.....Illinois
Caceres, Federico.....Peru, South America
Carroll, William M.....Ohio

Clohessy, William J.....Pennsylvania
Crosby, Joseph W.....Minnesota
Centlivre, Carl L.....Indiana
Cabrera, Jose G.....Philippine Islands
Carren, William J.....New Mexico
Cutler, William McL.....Iowa
Crawford, Peter.....New York
Condon, John J.....Illinois
Conley, Robert T.....Michigan
Cahill, Kieran.....Indiana
Cooke, Arthur J.....New York
Colahan, William P.....Pennsylvania
Cullinan, Daniel A.....Pennsylvania
Cullinan, Edward J.....Pennsylvania
Craig, Leo F.....South Dakota
Clear, Eugene C.....Illinois
Cajulis, Felix S.....Philippine Islands
Collier, Francis T.....Canada
Cunningham, James V.....Illinois
Cleary, Edward P.....Illinois
Casey, John D.....Michigan
Cull, Francis X.....Ohio
Conlin, Leo J.....Minnesota
Carr, Harry W.....Illinois
Cowles, Charles E.....Michigan
Concha, M. Francisco.....Peru, South America
Corrigan, Bartholomew H.....Mexico
Carroll, George H.....Ohio
Connell, James J.....Rhode Island
Connor, Peter F.....Illinois
Connolly, Edward J.....Illinois
Cressy, Sidney A.....Indiana
Corn, Baizel J.....Indiana
Cartwright, Marcus.....Tennessee
Cooley, Willard D.....Iowa
Coryell, Perry C.....Colorado
Cagney, Harry L.....Illinois
Cartier, Antoine E.....Michigan
Cotter, William E.....Illinois
Connolly, Raymond A.....Illinois
Comerford, John M.....Illinois
Comerford, George L.....Illinois

Carter, Lawrence J.....Illinois
Cassinelli, Alfred A.....Illionis
Conaty, Lionel J.....Illinois
Carroll, Leslie W.....Illinois

Diaz, Angel Llano.....Havana, Cuba
Devine, Clement L.....Ohio
Donovan, William J.....South Dakota
Donovan Richard W.....Illinois
Dubbs, James A.....Illinois
Draper, William A.....Illinois
Duque, Alberto.....Peru. South America
Dwan, Joseph A.....Illinois
Downs, William R.....Pennsylvania
Downs, Morris A.....Pennsylvania
Dolan, Sam M.....Oregon
Dupen, Francis L.....Wisconsin
Diskin, Michael A.....Pennsylvania
Dant, Ralph F.....District of Columbia
Delehanty, Thomas M.....Kentucky
Donavan, Daniel M.....New York
Donovan, Cornelius.....Mississippi
Donohue, Thomas W.....Illinois
Doremus, Charles.....France
Donahue, Wesley.....Illinois
Devers, John.....Pennsylyania
Donahue, Joseph A.....Indiana
Donovan, Thomas.....Illinois
Dannemiller, Frank T.....Ohio
Drumm, Arthur G.....Pennsylvania
Dilday, Noble B.....Indiana
Dent, Alfred C.....Minnesota
Derrick, Francis.....Pennsylvania
Dirks, John F.....Colorado
Duarte, Adolfo M.....Colombia, South America
Duncan, Walter J.....Illinois
Dierssen, Herbert O.....Illinois
Donnelly, Ambrose B. C.....Michigan
Donovan, Harmor V.....Pennsylvania
Depew, Pamphile C.....Michigan
Dodson, Morton B.....Illinois
Donovan, Rupert D.....Illinois

Davis, Howard C.....Indiana
Datu, Mauro M.....Philippine Islands
Dougherty, Ezra I.....West Virginia
Damanski, Leo.....New York
Dillon, Lee S.....Colorado
Dee, William T.....Illinois
Devitt, George P.....Illinois
Darst, William.....Illinois
Duque, Carlos A.....Pern, South America
Drew, Charles B. P.....New York
Davison, F. McIntosh.....Illinois
Doyle, Nicholas M.....Canada
Davin, John W.....New York
Duffey, John F.....Wisconsin
Dalton, Richard W.....Indiana
Davis, Clark W.....Indiana
Davis, Alfred McK.....Indiana
Dillon, Thomas A.....Illinois
Dee, Samuel A.....Illinois
Diener, John V.....Wisconsin

Eckert, John.....Indiana
Emerson, William G.....California
East, Carrol W.....Indiana
Escher, Edward P.....Pennsylvania
Estela, Juan N.....Colombia, South America
Eberhart, Ralph J.....Illinois
Esch, Gustave W.....Indiana
Estrada, Rafael.....Pennsylvania
Eggman, Fred W.....Indiana
Elfelt, Clifford S.....Illinois
Elfelt, Charles A.....Illinois
Ernest B.....Indinna

Fisher, Harold P.....Kentucky
Fox, Oscar A.....Indiana
Feeley, William P.....Illinois
Fansler, George D.....Indiana
Funk, Arthur S.....Wisconsin
Farrabaugh, Gallitzin A.....Pennsylvania
Finnegan, Edward.....Illinois
Forrestal, Peter.....Wisconsin

Faineau, Louis.....France
Fanneli, Salvatore P.....Kentucky
Fritzen, William H.....Indiana
Flynn, Charles J.....Massachusetts
Foik, Peter.....Canada
Fuller, Leonard M.....Iowa
Flaherty, James J.....Illinois
Fitzgibbon, Gerald A.....Illinois
Farrell, Francis T.....Illinois
Fernandez, Jose E.....Mexico
Fack, Edward C.....Indiana
Foltz, Frank J.....Indiana
Feig, Ralph S.....Indiana
Furlong, Leslie P.....Illinois
Fels, Hans G.....Germany
Frossard, Emil.....Indian Territory
Fox, John McD.....Wisconsin
Foley, William C.....Illinois
Frudenstein, Alvin R.....Mexico
Freudenstein, Benjamin M.....Mexico
Follansbee, Russell C.....Illinois
Follett, Judson G.....Minnesota
Fordyce, John M.....Wisconsin
Fanning, Francis E.....Indiana
Fanning, Lloyd A.....Indiana
Fritch, Louis.....Illinois
Fritch, Emil.....Illinois

Gaul, J. Ryan.....Michigan
Gowrie, William A.....Cuba
Gallart, Jose P.....Cuba
Guerra, Samuel J.....Mexico
Guerra, Gustavo I.....Mexico
Golden, Clayton C.....Michigan
Galligan, James.....New York
Goggin, James.....Michigan
Grande, Rafael F.....Mexico
Gagen, Harry E.....Indiana
Gerrard, Samuel D.....Indiana
Guerra, Arturo A.....Mexico
Gorman Theodore E.....Minnesota
Greathouse, Asa B.....Illinois

Greenslit, Ezra M.....Illinois
Galligan, William P.....Arkansas
Garvey, Harry V.....Illinois
Gpiffin, Peter M.....New York
Geary, Arthur M.....Pennsylvania
Garcia, Rufino F.....Philippine Islands
Gonzalez, Jose L.....Peru, South America
Gushurst, Albert F.....South Dakota
Gorman, Patrick A.....Texas
Gross, Harry A.....Illinois
Gavigan, Francis J.....Colorado
Gallart, Juan B.....Cuba
Garrity, Leo F.....Illinois
Garcia, Lorenzo C.....New Mexico
Garcia, Manuel L.....New Mexico
Gormley, James P.....Illinois
Goltra, Royal N.....South Dakota
Grove, William H.....Illinois
Gray, Neil.....Maryland
Gray, Reid B.....Maryland
Gotfredson, Robert B.....Michigan
Gering, Charles A.....Illinois

Harris, Thomas M.....Illinois
Healy, Thomas F.....Illinois
Hammer, Thomas A.....New York
Hanzel, Francis J.....Minnesota
Hurst, Roscoe P.....Illinois
Henning, Arthur A.....Missouri
Hill, Edwin W.....Illinois
Hanan, J. Frank.....Indiana
Hanrahan, Frank J.....Illinois
Hosinski, John S.....Indiana
Hagerty, Timothy.....Indiana
Hagerty, Cornelius.....Indiana
Haggerty, Patrick J.....Pennsylvania
Hebert, Alfred.....Michigan
Hanyz, Martin.....Indiana
Heiser, Allen J.....Indiana
Hosinski, Sylvester A.....Indiana
Hutzell, Oscar D.....Indiana
Hogan, Leo J.....Ohio

Hart, Laurence A.....Pennsylvania
Hutchins, William A.....Ohio
Halloran, Ruel G.....Utah
Hervey, Arthur.....Indiana
Hart, William J.....Wisconsin
Hamerski, Leo D.....Minnesota
Harber, Charles S.....Indiana
Hipolito, Segundo G.....Philippine Islands
Haney, Charles E.....Indiana
Hague, Harry.....Illinois
Harrington, Raymond R.....Illinois
Hoban, Martin C.....Indiana
Halloran, James P.....South Dakota
Heyl, William J.....Pennsylvania
Hazinski, Alexander S.....Indiana
Hunt, Andrew L.....Ohio
Healey, John V.....New York
Heekin, Walter V.....Ohio
Hannigan, John J.....Michigan
Hannon, Leo J.....New York
Herath, Fred L.....Illinois
Heeb, Louis B.....Illinois
Hilton, Albertus A.....Illinois
Hein, Joseph F.....Wisconsin
Holladay, Harold N.....Missouri
Hannah, Charles A.....Illinois
Hogg, Raymond D.....Illinois
Herr, Stephen H.....Illinois
Hilton, Hoyt W.....Illinois

Jordan, James D.....Pennsylvania
Johnson, Charles H.....South Dakota
Jaskowiak, Wenceslaus I.....Indiana
Joyce, Walter L.....Wisconsin
Johnson, Robert.....Missouri
Joyce Thomas M.....Montana
Juraschek, Max M.....Texas
Jochem, Philip.....Illinois
Jones, Charles W.....West Virginia
Jennings, Clarence J.....Illinois

Keeffe, James T.....Iowa
Kasper, Robert A.....Illinois

King, Charles B ..... Pennsylvania
Kemper, Henry M ..... Illinois
Kenny, Edward J ..... Pennsylvania
Kotte, Albert A ..... Ohio
Kehoe, James P ..... Wisconsin
Kelley, John C ..... Indiana
Kelley, Louis ..... Indiana
Kanaley, John B ..... New York
Kelley, Maxcy J ..... New York
Kennedy, Alexander J ..... Michigan
Kasper, William H ..... Illinois
Krost, Gerard N ..... Indiana
Keach, LeRoy J ..... Indiana
Kasper, Francis P ..... Illinois
Kelley, Charles H ..... Minnesota
Kinney, John E ..... Ohio
Kinney, James L ..... Ohio
Knauf, Arthur R ..... Wisconsin
Kenefick, Matthew J ..... Indiana
Kenefick, James J ..... Indiana
Karnopp, Arno W ..... Indiana
Klan, Theo ..... Pennsylvania
Kamm, Adolph X ..... Indiana
Knowlton, Grover ..... Illinois
Kasper, Simeon M ..... Illinois
Kelly, Clarence J ..... Illinois
Keefe, Daniel J ..... Michigan
Kelley, Paul W ..... Indiana
Kobak, Edgar ..... Illinois
Kavanaugh, John R ..... Illinois
Katz, Harold S ..... Illinois
Katz, Clarence W ..... Illinois
Kryl, Joseph ..... Illinois
Keefe, Edward J ..... Michigan
Kryl, John ..... Illinois

Louis, B ..... Indiana
Lally, Addis E ..... Iowa
Lantry, Joseph T ..... Kansas
Landenberger, Carl H ..... Illinois
Lennentz, William ..... Ohio
Lahey, Thomas A ..... Ohio

Leahey, Thomas A.....Indiana
Lawrence, Clarence A.....Indiana
Lecroq, John.....France
Lucas, Philip H.....Indiana
Lunden, Charles de.....Belgium
Lynch, John D.....Illinois
Lynch, John J.....Illinois
Lannan, Dennis.....Illinois
Larranaga, Armando.....Cuba
Lenertz, John A.....Oklahoma
Licup, Roman.....Philippine Islands
Lawless, John C.....Illinois
Lannon, Samuel B.....Illinois
Lamb, Rex E.....Michigan
Lee, Julius J.....Colorado
Lawrence, Vincent M.....Ohio
Lawrence, Frances T.....Ohio
Lange, Bernard H.....Pennsylvania
Landon, Benson.....Illinois
Leslie, Woody H.....Illinois
Little, Josiah.....Illinois
Lawrence, Roscoe E.....Illinois
Louisell, Clifton M.....Alabama

Madden, Ralph C.....Illinois
Madden, Daniel L.....Illinois
Murray, Francis J.....Illinois
Malloy, Patrick M.....Iowa
Munson, Frank E.....Illinois
Maher, Frank.....Indiana
Mack, Henry P.....Ohio
Maloney, John T.....Illinois
Minnick, William F.....New York
Miltner, Charles.....Michigan
Miltner, John.....Michigan
Marshall, Charles.....Ohio
Moloney, William.....Indiana
Moore, John E.....Illinois
Malloy, Bernard.....Illinois
Monaghan, Edward J.....Pennsylvania
Moreno, Manuel F.....Mexico
Mendez, Jose A.....Mexico

Miller, Martin H.....Ohio
Milne, Guy W.....Illinois
Muriel, Manuel V.....Mexico
Milner, Jay S.....Utah
Medrano, Higinio J.....Cuba
Marquez, Michael J.....Cuba
Martinez, Hermilio.....Mexico
Miles, Joseph T.....California
Miles, Warren C.....California
Moran, John B.....Michigan
Magnus, Clarence P.....Illinois
Murphy, John W.....Ohio
Murphy, John P.....Indiana
May, Henry F.....Rhode Island
Mullen, Cyril J.....Argentina, South America
Madden, Frank.....Michigan
Murray, John J.....Pennsylvania
Miller, Hugh E.....Ohio
Maroney, Joseph J.....Indiana
Maguire, Thomas O.....Illinois
Martin, James J.....Illinois
Munoz, Joseph M.....Mexico
Murphy Michael C.....Pennsylvania
Maurer, Ralph A.....Indiana
Murphy, John D.....Illinois
Murphy, Raymond M.....Ohio
Martinelli, Gregory E.....Peru, South America
Morris, Ernest M.....Indiana
Meenach, Harry W.....Washington
Molina, Alexander E.....Peru, South America
Miralles, John J.....Cuba
Murray, Charles D.....Colorado
Mooney, Edward L.....Minnesota
Minotti, Charles R.....West Virginia
Mertes, Albert T.....Michigan
Mueller, Adolph S.....Colorado
Mangan, Louis A.....North Dakota
Milius, George A.....New York
Martin, Lester G.....Missouri
Mann, Milton A.....Illinois
Martin, Winfred E.....Illinois
Moran, George.....Illinois

Mose, Richard P. C.....Indiana
Makley, Walter L.....Ohio
Machalinski, Aloysius.....Pennsylvania
Murphy, James F.....Pennsylvania
Madarasz, Jesse A.....Colorado
McCarthy, Frank A.....Iowa
McFarland, Alexander W.....Ohio
McCaffrey, John A.....Pennsylvania
McNerny, Lawrence.....Illinois
McInerny, Joseph W.....Indiana
McAvoy, Thomas P.....New York
McGlew, Henry J.....Indiana
McCawley, Francis J.....Kentucky
MacCauley, Hugh.....Rhode Island
McQuaid, William B.....Indiana
McElhone, James.....Pennsylvania
McFaul, Arthur.....Michigan
McGinn, John.....Rhode Island
McDonald, Angus.....Michigan
McBride, Edmund L.....Pennsylvania
McIntyre, Palmer.....Illinois
McDonald, Edwin A.....Texas
McGannon, T. Paul.....New York
McCarty, Franklin B.....Massachusetts
McCoy, John R.....Wisconsin
McDonough, Harry F.....Illinois
McNally, Raymond A.....Ohio
McCallen, Leo J.....Pennsylvania
McDonald, Lawrence.....Illinois
McDonald, David.....Illinois
McAleenan, Fred J.....Illinois
McGuinness, Michael J.....New Mexico
McAleenan, Howard W.....Illinois
McMahon, John F.....South Dakota
McIver, James S.....New York
McIver, Francis F.....New York
McGreevy, James J.....Indiana
McDowell, R. Newton.....Missouri
McDermott, Edward L.....Pennsylvania
McFadden, Thomas J.....Illinois
McMorran, William E.....Illinois
McFarland, Clarence J.....Ohio

McKinley, Hugh A.....Indiana
McKinley, Innoc J.....Indiana
McNair, John G.....Missouri
McNabb, Clyde L.....Mexico
McGrath, John M.....Illinois
McMeal, Gerald B.....Illinois
McNabb, Howard E.....Illinois

Nieto, Francis G.....Mexico
Nabers, Theodore H.....Iowa
Nunn, Isidore C.....Ohio
Niedbalski, Stanley W.....Indiana
Noel, Purcell M.....Michigan
Neyman, Gunther.....Wisconsin

O'Shea, John P.....Indiana
O'Flynn, Edward F.....Montana
Oberst, Albert B.....Kentucky
O'Brien, Simon A.....New York
O'Connell, Ambrose.....Iowa
Olding, Herman H.....Kentucky
O'Donnell, Walter.....Michigan
O'Donnell, Charles.....Indiana
O'Shea, William.....Indiana
Ohmer, H. Beckman.....Ohio
Ohmer, Robert F.....Ohio
Oelerich, Frank J.....Illinois
Oelerich, Joseph F.....Illinois
O'Donnell, Aloysius J.....Pennsylvania
O'Gorman, Samuel.....Massachusetts
O'Brien, Karl A.....Pennsylvania
O'Neill, Richard C.....Minnesota
O'Brien, William T.....Indiana
Ortiz, Manuel I.....Puerto Rico
O'Leary, James.....Illinois
O'Neill, William P.....Indiana
Olston, Francis M.....West Virginia
Orozco, Pascual.....Mexico
O'Donnell, T. Raymond.....Indiana
O'Reilly, Francis W.....Kansas
O'Connell, Thomas B.....Illinois

Perce, William E.....Illinois
Pino, Arthur.....Peru, South America
Pohlman, John F .....Indiana
Pryor, Francis.....Colorado
Perez, John P.....Cuba
Palomar, Louis.....Mexico
Paupa, Joseph.....Illinois
Paine, Robert E.....Texas
Paz, Daniel de la.....Philippine Islands
Portilla, Angel L.....Cuba
Powers, Leo F.....New York
Papin, Henry L.....Ohio
Petritz, William E.....Illinois
Prada, Joseph N.....Mexico
Probst, Rudolph O.....Indiana
Pulver, Herbert R.....Illinois
Peil, Edward F.....Wisconsin
Peurrung, Joseph C.....Ohio
Ponce, Alphonsus E.....Philippine Islands

Quinlan, James.....Illinois
Quinlan, Joseph.....Illinois
Quinn, John C.....Pennsylvania
Quevedo, Manuel G.....Mexico
Quiros, Francis A.....Mexico
Quinlan, Norbert A.....Illinois
Quealy, Jay A.....Wyoming

Roesch, Charles E.....Indiana
Riordan, Stephen F.....Illinois
Roberts, Harry N.....Illinois
Rubio, Marcelino G.....Cuba
Rennacker, Roy G.....Illinois
Robinson, William F.....Mississippi
Roan, Francis J.....Ohio
Roach, John W.....Iowa
Requena, Joseph L.....Mexico
Rogers, John H.....Illinois
Rothinghouse, Ernest.....Indiana
Ribeyre, Robert R.....Indiana
Roa, Manuel A.....Philippine Islands
Rice, William H.....Pennsylvania

Reyes, Carmelo M.....Philippine Islands
Rempe, George A.....Illinois
Rowan, George L.....Iowa
Rowlands, Carl K.....Ohio
Railton, Raymond A.....Illinois
Rush, Eugene A.....Illinois
Riley, Thomas H.....Indiana
Ryan, Thomas A.....Illinois
Ryan, John M.....Illinois
Rozewicz, Anthony.....Indiana
Ruof, John.....Pennsylvania
Richmond, LeRoy A.....Illinois
Richmond, Wilfred A.....Illinois
Rubio, Ramon G.....Cuba
Rempe, Lester G.....Illinois
Ressler, Fred A.....Idaho
Rousseau, Rafael.....Cuba
Rieke, Lawrence E.....Missouri
Reilly, Charles F.....Massachusetts
Riley, William J.....Indiana
Ryan, William P.....Illinois
Ryan, William B.....Illinois
Rice, Wilfred W.....Mississippi
Roe, Benjamin.....Illinois
Roberts, Thomas B.....South Dakota
Romana, Albert L.....Peru, South America
Roberts, Godfrey M.....South Dakota
Reasoner, Cherry R.....Tennessee
Roe, Maurice.....Illinois
Rider, Elroy M.....Indiana
Robinson, J. Gerard.....Pennsylvania
Romana, John M.....Peru, South America

Saley, Robert L.....Iowa
Shea, John F.....Massachusetts
Sinnott, Joseph D.....Oregon
Sheehan, Clarence J.....Illinois
Silver, Nathan.....Illinois
Simon, Arthur F.....Cuba
Stopper, Anthony J.....Pennsylvania
Smith, J. Preston.....Pennsylvania
Shaughnessy, Francis J.....Illinois

Schwab, Edward A.....Pennsylvania
Sugita, Francis Y.....Japan
Scales, John J..... New York
Shenk, Robert R.....Ohio
Strauss, Fred H. A.....Illinois
Symonds, Edward L.....Illinois
Sawyer, John X.....Pennsylvania
Smith, Leonard F.....Indiana
Shenners, Francis L.....Wisconsin
Schubert, Francis J.....Indiana
Skopowski, Hippolit J.....Illinois
Stack, James.....Illinois
Stuczko, Boleslaus.....Illinois
Steiner, William.....New York
Szamecki, Stanislaus P.....Indiana
Sobolewski, Wenceslaus.....Illinois
Schumacher, Joseph L.....Indiana
Serrano, Peter.....Philippine Islands
Sprenger, George W.....Illinois
Seigler, Frank J.....Pennsylvania
Stoakes, Lawrence M.....Pennsylvania
Springer, Albert G.....Colorado
San Pedro, Manuel R.....Cuba
Shenefield, Warren D.....Indiana
Sorg, Claude A.....Ohio
Schmitt, Rudolph J.....Ohio
Schmitt, Alfred H.....Ohio
Sexton, Thomas G.....Illinois
Suarez, Eladio.....Cuba
Stuhlfauth, Jacob.....Wisconsin
Schmitt, William C.....Minnesota
Scharps, Arthur L.....Illinois
Stout, Walter S.....Toronto, Canada
Sullivan, Robert B.....Illinois
St. Claire, Huntington.....Illinois
Summers, Edward J.....Indiana
Sheehan, Thomas A.....Ohio
Symonds, Henry R.....Illinois
Sickler, Frank J.....Illinois
Schick, Francis.....Indiana
Smith, Charles J.....Illinois
Smith, Walter L.....West Virginia

Sheahan, Joseph G.....Illinois
Schwalbe, Joseph W.....Illinois
Schwalbe, Oscar H.....Illinois
Scharps, Lawrence H.....Illinois
Sanders, Walter.....Indiana
Schultz, John.....South Dakota

Tobin, Thomas J.....South Dakota
Trevino, Gustavo L.....Mexico
Toth, Joseph.....Indiana
Tracy, Leo.....Michigan
Tobolski, Stanislaus.....Indiana
Terry, Clifford H.....Illinois
Trumbull, Selden.....Illinois
Talifero, William B.....Indiana
Talcott, Rodney D.....Indiana
Teodoro, Joseph.....Philippine Islands
Tello, Manuel A.....Peru, South America
Tomlinson, John B.....Arkansas
Thornton, John S.....Minnesota
Tello, Richard A.....Peru, South America
Toohey, James A.....New York

Uhrich, Maurus J.....Washington
Underwood, Eugene.....Washington, D. C.

Villanueva, Augustine P.....Mexico
Valdes, Joseph E.....Philippine Islands
Villanueva, Louis S.....Mexico
Vernaza, Carlos M.....Colombia, South America
Vallejo, Alphonsus.....Colombia, South America
Vallecilla, Leonard.....Colombia, South America
Vanderhoof, Edward S.....Indiana
Veazey, Oscar E.....West Virginia
Vernaza, William O.....Colombia, South America
Von Phul, Carol A.....Missouri
Vocke, M. J. William.....Illinois
Veazey, Louis B.....West Virginia
Villaflor, Pastor.....Philippine Islands
VanCleve, Franklin H.....Illinois

Wadden, John W.....South Dakota
Worden, John.....New York

Waldorf, Rufus W.....Illinois
Welsh, Leo J.....Illinois
Watkins, James.....Michigan
Williams, Lawrence A.....Pennsylvania
Williams, Harry G.....Indiana
Wood, Edward E.....Illinois
Woolverton, Earl E.....Indiana
Weis, Henry E.....Wisconsin
Weber, Henry W.....Illinois
Wrobel, John J.....Indiana
Wenninger, Francis J.....Indiana
Weisbecker, Aloysius.....Indiana
Whalen, Joseph M.....Iowa
Woulfe, Thomas R J.....Indiana
White, Robert L.....Illinois
Womack Harry B.....Missouri
Woods, James A.....Colorado
Wilson, Richard B.....Illinois
Washburn, George E.....Illinois
Warren, Homer S.....Illinois
Weist, John L.....Washington
Wahlen, Albert H.....Indiana
Wessel, Charles J.....Ohio
Weber, Charles R.....Illinois
Walsh, Raymond R.....Illinois
Wilce, Horace M.....Illinois
White, Carl B.....Tennessee
Wessel, John H.....Ohio
Wessel, Herbert J.....Ohio
Wiercinski, Nicholas.....Pennsylvania
Wilezewski, Anthony.....Pennsylvania

Young, Jacob P.....Indiana
Youngerman, Frank.....Iowa
Yrisarri, Jacob J.....New Mexico
Yrisarri, Edward C.....New Mexico

Zerhusen, Francis.....Kentucky
Zink, Charles.....Ohio
Zink, Francis A.....Ohio
Zimmer, Harry J.....Pennsylvania

Sixty-Second Annual Commencement.

Degrees, Honors, Prize Medals.

CONFERRING OF DEGREES.

The Degree of Doctor of Laws was conferred on

The Reverend Denis Joseph Stafford, Washington, D. C.

The Reverend John Thomas O'Connell, Toledo, Ohio.

The Reverend Morgan Madden Sheedy, Scranton, Pennsylvania.

Henry Nicholas Moyer, M. D., Chicago, Illinois.

Frank Allport, M. D., Chicago, Illinois.

The Degree of Master of Arts was conferred on

Henry Michael Kemper, Chicago, Illinois.

The Degree of Master of Laws was conferred on

Edward Hermann Schwab, Loretto, Pennsylvania.

The Degree of Bachelor of Arts was conferred on

Albert Ernest Blin, Craon, France.

Eugene Paul Burke, Chicago, Illinois.

Charles Louis Doremus, Ploezal, France.

Louis Henry Faineau, Angers, France.

Edward Joseph Finnegan, Chicago, Illinois.

James Henry Galligan, Tarrytown, New York.

Thomas Aloysius Hammer, New York City.

Cornelius Joseph Hagerty, South Bend, Indiana.

John Marie Lecroq, Goven, France.

Hugh Bartholomew MacCauley, Providence, R. I.

John Connor McGinn, Providence, Rhode Island.

Charles Leo O'Donnell, Kokomo, Indiana.

William Charles O'Brian, Columbus, Ohio.

Francis Xavier Zerhusen, Covington, Kentucky.

The Degree of Bachelor of Letters was conferred on

Walter James O'Donnell, Grand Rapids, Michigan.

John Michael Ryan, Chicago, Illinois.

The Degree of Bachelor of Philosophy was conferred on
Addis Emmett Lally, Denison, Iowa.
Alexander William McFarland, Lima, Ohio.
John Francis Shea, Holyoke, Massachusetts.

The Degree of Civil Engineer was conferred on
John Francis Cushing, Chicago, Illinois.
James Allen Dubbs, Mendota, Illinois.
William Patrick Feeley, Joliet, Illinois.
Harold Preston Fisher, Paducah, Kentucky.
Samuel Joseph Guerra, San Luis Potosi, Mexico.
Albert Alton Kotte, Cincinnati, Ohio.
John Patrick O'Shea, South Bend, Indiana.
Maurus Joslyn Uhrich, Spokane, Washington.
Anthony James Stopper, Williamsport, Pennsylvania.
Harry Norman Roberts, Bloomington, Illinois.

The Degree of Mechanical Engineer was conferred on
Matthew Axton Campbell, Wheeling, West Virginia.

The Degree of Mechanical Engineer in Electrical Engineering was conferred on
Arthur Pino, Arequipa, Peru, South America.
Charles Edward Roesch, Indianapolis, Indiana.
Nathan Silver, Chicago, Illinois.

The Degree of Bachelor of Science in Architectural Engineering was conferred on
Evariste Raymond Batlle, Barcelona, Spain.
Joseph Joachim Batlle, Barcelona, Spain.

The Degree of Bachelor of Science was conferred on
Arthur Funk, Lacrosse, Wisconsin.

The Degree of Bachelor of Science in Biology was conferred on
Emilius Morancy McKee, Versailles, Kentucky.

The Degree of Bachelor of Laws was conferred on
Michael Joseph Brown, Philadelphia, Pennsylvania.
Terence Byrne Cosgrove, Seneca, Illinois.
Richard William Donovan, Chicago, Illinois.
Clayton Charles Golden, Monroe, Michigan.
Francis John Hanzel, New Prague, Minnesota.
Roscoe Patterson Hurst, Hudsonville, Indiana.
Thomas Francis Healy, Rochelle, Illinois.
Thomas Michael Harris, Lee, Illinois.
Daniel Lawrence Madden, Chicago, Illinois.
Ralph Cleveland Madden, Mendota, Illinois.
Frank Artemus McCarthy, Britt, Iowa.
Joseph Walter McInerny, South Bend, Indiana.
Lawrence Michael McNerney, Elgin, Illinois.
Ernest Melvin Morris, South Bend, Indiana.
Albert Benedict Oberst, Owensboro, Kentucky.
William Patrick O'Neill, Mishawaka, Indiana.
William Edward Perce, Hanover, Illinois.
Stephen Francis Riordan, Chicago, Illinois.
Francis Joseph Shaughnessy, Amboy, Illinois.
Joseph Edward Valdes, Manila, Philippine Islands.

The Degree of Pharmaceutical Chemist was conferred on
Michael John Marquez, Havana, Cuba.

The Degree of Graduate in Pharmacy was conferred on
Samuel Wade Applegate, South Bend, Indiana.
James Sylvester Brady, Chicago, Illinois.
Martin Clement Hoban, South Bend, Indiana.
Michael John Marquez, Havana, Cuba.
Eugene Alphonsus Rush, Chicago, Illinois.
John Worden, Ossining, New York.

Certificates for the Short Program in Electrical Engineering were awarded to
Charles Henry Brenneck, Somonauk, Illinois.
John Bell Moran, Detroit, Michigan.

Theodore Hermann Nabers, Fort Madison, Iowa.
John Charles Quinn, Pittsburg, Pennsylvania.
Jacob Stuhlfauth, Wausau, Wisconsin.

Commercial Diplomas were awarded to
Clarence William Burns, Alexis, Illinois,
Richard William Dalton, Huntington, Indiana.
Frank Thierry Dannemiller, Canton, Ohio.
Emil Frossard, Marietta, Indian Territory.
Rex Edward Lamb, Buchanan, Michigan.
B. Louis, Notre Dame, Indiana.
John Daniel Lynch, Monmouth, Illinois.
Francis Joseph Oelerich, Chicago, Illinois.
Louis Palomar, Guadalajara, Mexico.
Francis Quiros, Sonora, Mexico.
Rudolph Jacob Schmitt, Toledo, Ohio.
Frederick Henry Strauss, Chicago, Illinois.

PRIZE MEDALS.

The Quan Gold Medal, presented by Mr. Henry Quan, of Chicago, for the student having the best record in the Classical Course, Senior year, was awarded to
Charles Leo O'Donnell, Kokomo, Indiana.

The Mason Gold Medal, presented by Mr. George Mason, of Chicago, for the student of Carroll Hall having the best record for the scholastic year, was awarded to
Richard Bruce Wilson, Chicago, Illinois.

The Meehan Gold Medal, for English Essays, presented by Mrs. James Meehan, Covington, Kentucky, was awarded to
Charles Leo O'Donnell, Kokomo, Indiana.

The Breen Gold Medal, for Oratory, presented by the Hon. William P. Breen, LL. D., '02, of Fort Wayne, was awarded to

Edward Francis O'Flynn, Butte, Montana.

The Ellsworth C. Hughes Gold Medal, presented by Mr. A. S. Hughes, Denver, Colorado, for the best record in Mathematics (Civil Engineering Course) was awarded to

Harry Norman Roberts, Bloomington, Illinois.

The O'Keefe Gold Medal, for the best essay on a legal subject, presented by Mr. P. J. O'Keefe, of Chicago, was awarded to

Michael Joseph Brown, Philadelphia, Pennsylvania.

The Chicago Alumni Association Gold Medal, for Christian Doctrine, was awarded to

Thomas Patrick Butler, Allegheny, Pennsylvania.

The Gold Medal for Christian Doctrine in Moral Course A. was awarded to

Jacob Philip Young, Huntington, Indiana.

The Quinn Gold Medal for Christian Doctrine in Moral B., 1st Division, presented by the Reverend John J. Quinn, A. B., '83, pastor, St. John's Church, Peoria, Illinois, was awarded to

Leonard Michael Fuller, Muscatine, Iowa.

The Fitzsimmons Gold Medal for Christian Doctrine in Moral Course B., 2d Division, presented by the Reverend M. J. Fitzsimmons, Rector of Holy Name Cathedral, Chicago, was awarded to

Guy Gibson Bailey, Mackinac Island, Michigan.

The Mooney Gold Medal for Christian Doctrine in Moral B., 3rd Division, presented by the Reverend Nathan J. Mooney, '77, Rector of St. Columbkille's Church, Chicago, was awarded to

Felix Segundo Cajulis, Cavite, Philippine Islands.

The Barry Gold Medal for Christian Doctrine in Carroll Hall, Second Course, presented by the Reverend F. J. Barry, Chancellor of the Archdiocese of Chicago, was awarded to

Wilford Washington Rice, Vicksburg, Mississippi.

The Commercial Gold Medal for the best record in the Commercial School was awarded to

Frank Thierry Dannemiller, Canton, Ohio.

The Gold Medal for the best record in the last two years of the Preparatory Latin Courses was awarded to

Sylvester Aloysius Hosinski, South Bend, Indiana.

Seventy-five Dollars in Gold, for debating work, was awarded as follows:

THIRTY-FIVE DOLLARS to Cornelius Joseph Hagerty, South Bend, Indiana.

TWENTY-FIVE DOLLARS to William Augustine Bolger, Clifford, Michigan.

FIFTEEN DOLLARS to Wesley James Donahue, Chicago, Illinois.

Fifty Dollars in Gold, presented by the Reverend Louis Moench, Mishawaka, Indiana, to the victors in the debate between the University of Notre Dame and Georgetown University, was awarded to

Gallitzin Aloysius Farabaugh, Chambersburg, Pennsylvania.

Terence Byrne Cosgrove, Seneca, Illinois.

Patrick Mervan Malloy, Salix, Iowa.

The Barry Elocution Medal in the First Section donated by the Honorable P. T. Barry, of Chicago, was awarded to

Hoyt Watson Hilton, Chicago, Illinois.

The Gold Medal for Elocution in the Second Section was awarded to

John Lambert Weist, Walla Walla, Washington.

ST. EDWARD'S HALL.

The Abercrombie Gold Medal for General Excellence was awarded to
Charles R. Weber, Chicago, Illinois.

The Sorin Gold Medal for Elocution was awarded to
Francis J. Schick, Terre Haute, Indiana.

The Gold Medal for Composition was awarded to
Fidelis N. Burtt, Galesburg, Illinois.

The Gold Medal for Improvement in Piano was awarded to
Clyde L. McNabb, Chicago, Illinois.

The Gold Medal for Penmanship was awarded to
Antoine E. Cartier, Chicago, Illinois.

The Silver Medal for Composition was awarded to
Arthur Arnold, Chicago, Illinois.

The Silver Medal for Penmanship was awarded to
William H. Grove, Decatur, Illinois.

The Silver Medal for Letter-Writing was awarded to
Charles J. Smith, Chicago, Illinois.

FIRST HONOR AWARDS.

[First Honors are awarded to students of Sorin, Corby, Brownson, and St. Joseph Halls who have attained an average of at least 90 per cent. for scholarship and 90 per cent. for deportment during the scholastic year. The first honor awarded for the first year takes the form of Honorable Mention; that awarded for two years of satisfactory work is a gold medal. This medal may be renewed from year to year.]

First Honor Gold Medals were awarded to

Evariste Raymond Batlle, Barcelona, Spain. (Renewal.)
Edward Patrick Cleary, Momence, Illinois.
James Vincent Cunningham, Chicago, Illinois.
Francis Derrick, Oil City, Pennsylvania.
Frank Artemus McCarthy, Britt, Iowa.
Franklin B. McCarty, Lynn, Massachusetts.
Edwin Alexander McDonald, Houston, Texas. (Renewal.)
David McDonald, Seward, Illinois.
Anthony James Stopper, Williamsport, Pennsylvania.
Frank Aloysius Zink, Canton, Ohio. (Renewal.)

Honorable Mention was accorded to

Michael Joseph Brown, Philadelphia, Pennsylvania.
Thomas Patrick Butler, Allegheny, Pennsylvania.
Francis Lysaght Dupen, Superior, Wisconsin.
William Patrick Feeley, Joliet, Illinois.
James Dominick Jordan, Scranton, Pennsylvania.
Alexander William McFarland, Lima, Ohio.
Stephen Francis Riordan, Chicago, Illinois.
Joseph Edward Valdes, Manila, Philippine Islands.
Michael Aloysius Diskin, Scottdale, Pennsylvania.

Leonard Michael Fuller, Muscatine, Iowa.
William Ambrose Hutchins, Columbus, Ohio.
John Bernard Kanaley, Weedsport, New York.
Palmer McIntyre, Hanover, Illinois.
Robert Fasold Ohmer, Dayton, Ohio.
H. Beckmann Ohmer, Dayton, Ohio.
Robert Etris Bley, Bunker Hill, Illinois.
Felix Segundo Cajulis, Cavite, Philippine Islands.
Rufino F. Garcia, Magsingal, Philippine Islands.
Leo Dominick Hamerski, Winona, Minnesota.
Daniel de la Paz, Gapan, Philippine Islands.
Carmelo M. Reyes, Lipa, Philippine Islands.
Joseph Teodoro, Bay Laguna, Philippine Islands.
Jacob Philip Young, Huntington, Indiana,
Francis Xavier Cull, Miamisburg, Ohio.

DEPORTMENT PRIZES.

[Gold Medals for Deportment are awarded to pupils of Carroll and St. Edward's Halls who have spent two full years at Notre Dame and whose deportment during the whole time has been unexceptionable.

Silver Medals for Deportment are awarded to pupils of St. Edward's Hall who have spent two full years at Notre Dame and whose deportment has given general satisfaction.

Certificates for excellent deportment are awarded to pupils of Carroll and St. Edward's Halls who have been in residence at least two terms, and whose deportment during the whole time has been unexceptionable.]

CARROLL HALL.

Gold Medals for Deportment were awarded to
John B. Gallart, Guantanamo, Cuba. (Renewal.)
Stephen H. Herr, Chattsworth, Illinois.
Bernard H. Lange, Oil City, Pennsylvania.
Edward L. McDermott, Kane, Pennsylvania.
William Patrick Ryan, Lake Forest, Illinois.

ST. EDWARD'S HALL.

Gold Medals for Deportment were awarded to
Raymond A. Connolly, Chicago, Illinois.
William E. Cotter, Chicago, Illinois.
George L. Comerford, Minooka, Illinois.
Neil Gray, Detroit, Michigan.
Albertus Hilton, Chicago, Illinois.
Edgar Kobak, Chicago, Illinois.
Clifton Louisell, Manistee, Alabama.
George A. Milius, New York City.
John McNair, St. Louis, Missouri.
T. R. O'Donnell, Montpelier, Indiana.
Francis W. O'Reilly, Topeka, Kansas.
Edward F. Peil, Racine, Wisconsin.
Walter L. Smith, Round Bottom, West Virginia.
Richard Tello, Cuzco, Peru, South America.
Charles R. Weber, Chicago, Illinois.

ST. EDWARD'S HALL.

Silver Medals for Deportment were awarded to
Godfrey M. Roberts, Armour, South Dakota.
Herbert R. Pulver, Chicago, Illinois.

CARROLL HALL.

Certificates for Deportment were awarded to
Richard Bloss, New Orleans, Louisiana.
Manuel Concha, Cuzco, Peru, South America.
Lee Dillon, Denver, Colorado.
James Gormley, Chicago, Illinois.
Harry Meenach, Seattle, Washington.
John Miralles, Guantanamo, Cuba.
Raphael Rousseau, Guantanamo, Cuba.
William Bernard Ryan, Cairo, Illinois.

ST. EDWARD'S HALL.

Certificates for Deportment were awarded to

George K. Brady, Chicago, Illinois.
Horace C. de Baca, Denver, Colorado.
Alfred C. de Baca, Denver, Colorado.
Charles S. Berriman, New York City.
Charles M. Broad, Chicago, Illinois.
Charles N. Berteling, South Bend, Indiana.
John M. Comerford, Minooka, Illinois.
Alfred A. Cassinelli, Chicago, Illinois.
Perry C. Coryell, New Castle, Colorado.
Lionel J. Conaty, Chicago, Illinois.
Lawrence J. Carter, Chicago, Illinois.
Lloyd A. Fanning, Chicago, Illinois,
Judson M. Fordyce, Butternut, Wisconsin.
Louis M. H. Fritch, Chicago, Illinois.
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Clarence W. Katz, Chicago, Illinois.
Joseph Kryl, Chicago, Illinois.
Edward J. Keefe, Detroit, Michigan.
Lester G. Martin, St. Louis, Missouri.
Winfred E. Martin, Chicago, Illinois.
George E. Moran, Chicago, Illinois.
Richard P. C. Mose, English Lake, Indiana.
Clyde L. McNabb, Chicago, Illinois.
John J. M. McGrath, Mexico City, Mexico.

Milton A. Mann, Rogers Park, Illinois.
Thomas B. O'Connell, Chicago, Illinois.
Joseph C. Peurrung, Cincinnati, Ohio.
Girard J. Robinson, Pittsburg, Pennsylvania.
Joseph G. Sheahan, Winnetka, Illinois.
Louis B. Veazey, Pratt, West Virginia.
Carl B. White, Chattanooga, Tennessee.

NEEDS OF THE UNIVERSITY.

Visitors to Notre Dame judge from the appearance of the buildings and grounds that the University has no need of money. The University is, nevertheless, absolutely without endowment, and its work is seriously hampered because it has no resources except the fees of students. There are two scholarships, and the interest from these foundations is used in educating and boarding two students.

There are, from conservative figures, 3,500 Catholic students in the non-Catholic colleges of America, and very many of these will lose their faith, and all will be weakened in that faith, because our people look upon collegiate institutions as the property of private corporations which are to be left to take care of themselves.

Notre Dame asks for scholarships for boys who can not pay the expense of education, and who therefore are obliged to go to non-Catholic colleges to the detriment of their faith. A foundation of $8,000 will educate and board a student as long as the University exists. As one student is graduated another can take his place. The founder of the scholarship, of course, always has the privilege of appointing the student.

We lack money for a library building, and for two more dwelling-halls like Sorin Hall.

Foundations for scholarships are a pressing need.

There is no Library fund for the purchase of new books.

The names of benefactors will be given to all foundations.

BEQUESTS SHOULD BE MADE IN THIS FORM:

UNIVERSITY OF NOTRE DAME DU LAC

I give, devise, and bequeath to the *UNIVERSITY OF NOTRE DAME DU LAC*, an institution incorporated under the laws of the State of Indiana, and located at Notre Dame, Indiana.....

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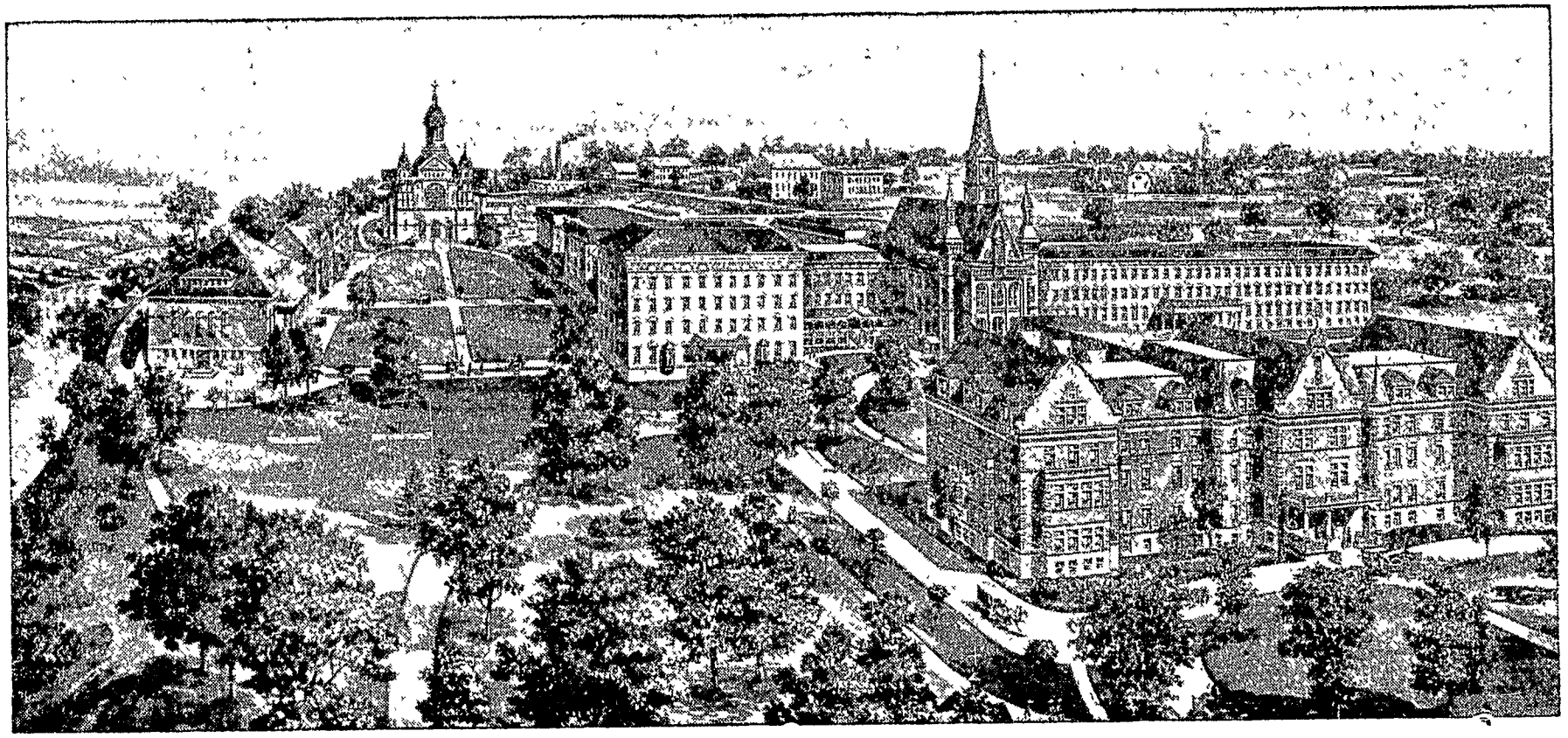

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