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COLLEGE OF ARCHITECTURE

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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.

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

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, the Chicago and Indiana Southern, and the Michigan Central railways run directly into South Bend.

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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.'

COLLEGE OF ARCHITECTURE

Architecture is, fundamentally, a fine art; but it is a fine art that may 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-Artist 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 Program in Architecture from the College of Engineering and to create the new College of Architecture.

The Faculty of the College now offer a short course program, three undergraduate programs and two graduate programs to men able to furnish the entrance requirements.

The Short Program covering two years is designed for students finding it impossible or inexpedient to devote to school work the time required for completing the programs leading to degrees. Upon completion of the Short Program a Certificate of Proficiency is given.

The two Design Programs ordinarily require four years for completion. These programs are identical, except that one major course in one is English, with various electives in the third and fourth years, and in the other the major is Mathematics. They are 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 of Bachelor of Science in Architectural Engineering is given at completion.

Graduate years are offered in both programs, and upon completion, Master's degrees are conferred.

In the fourth year and in the Short Program, the classroom requirements are less and the time to be spent in the draughting-room correspondingly lengthened.

Students matriculating for the Short Program or any 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, or in Chicago at the offices of the University on days announced in the press of that city.

Students may not matriculate with more than one condition; and any condition interfering with the routine of the courses 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 School 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 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; a large elaborate model of the Cook County Court House, Chicago; 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 Traveling Fellowship, preferably for the study of European Ecclesiastical Architecture, will be a benefaction of the utmost value. One thousand dollars will provide for one man for one year.

ENTRANCE REQUIREMENTS.

Candidates for the First Year in any four-year program, 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 in an accredited High School or Preparatory School of equal rank.

ENGLISH. Part of the examination is given for answering questions upon the text-books and readings required in the preparatory courses in English; the remainder for writing an essay.

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* Draftsmen, of twenty-two years of age or older, of not less than two years' experience, and others as well qualified, may take up the work of the Short Program without examination.

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 of an equivalent in the larger treatises by other authors.

GEOMETRY. Plane and Solid.

TRIGONOMETRY. Plane and Spherical.

HISTORY. A general knowledge of the outlines of Greek and Roman History and of Medieval and Modern history, as set forth in the texts used in the high schools and academies of the country.

CHEMISTRY. Elements of inorganic chemistry, as given in high schools of good standing. Laboratory work is also 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 also required.

CIVICS. Elementary.

FRENCH. A three years' course in French is required. Ability to translate at sight French into English, and easy English sentences into French.

GERMAN. An equivalent course in German or any other language may be offered for French.

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

THE DESIGN PROGRAMS.

DEGREE: Bachelor of Science in Architecture
Master of Science in Architecture

It has been the aim of the College in offering the first design program to so plan 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 a noble profession.

It follows essentially the course of study planned by the American Institute of Architects, as outlined in the yearly reports of its Committee on Education.

The second program is offered for the convenience of students who desire to specialize in Mathematics rather than in English, or who have advanced standing for work done at other schools and who wish to complete the work leading to a degree at Notre Dame.

The programs are 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 first 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 modeling. All instruction in planning and composition is based on accepted 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 so that the student may know good work and thus be able to superintend construction intelligently. The practical lessons are supplemented by regular inspection trips to the important building operations and industries in the neighborhood of the University, and by an annual visit to Chicago of three or four days' duration, always made during the time of the Chicago Architectural Club's annual exhibit. Last year the classes saw the making of steel at the U. S. Steel Corporation's immense new plant, at Gary, Indiana; of cement at the Universal Portland Cement Co.'s Buffington plant; of architectural terra cotta at the Northwestern Terra Cotta Co.'s works, and of wrought iron and bronze at the Winslow Bros. Co.'s works. The Chicago trip is part of the required work.

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 are 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 four years. The method is a combination of lectures, recitation and research.

On the Chicago trip, a day is always spent visiting the Egyptian and Roman antiquities at the Field Museum, and the collection of paintings, sculpture and architectural casts at the Art Institute.

Courses either in mathematics or in English (with Electives as noted below) covering four years complete the curriculum.

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 limit 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 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 differs from that of the first Design Program, chiefly in the following particulars:

Courses in pure and applied Mathematics are substituted for the courses in English, Economics and Philosophy; the more important Construction courses go deeper into theory; Freehand work ends with the second year; the study of Historic Ornament and the Histories of the "allied arts" omitted; and a relatively greater amount of time, increasing each year, is spent on structural design.

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

THE SHORT PROGRAM.

Certificate of Proficiency.

Many ambitious men, who wish to follow the profession of Architecture, find themselves unable to devote the time needed to obtain a degree; other men, who have worked as draftsmen in architect's offices, see the necessity of an education on broader lines. The Short Program is designed to meet the needs of these men. It covers a great deal of the purely architectural work of the four-year Programs. And while it comprises such elementary work as the Orders, Perspective, Shades and Shadows, the College Faculty will gladly substitute for that additional time in Design.

Candidates for the Certificate may, if proficient in other courses, substitute for them equivalent additional work from the four-year 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.

EXPLANATION OF "HOURS."

A class hour means one hour of recitation or lecture and one to two hours of preparation.

A freehand or design hour means two actual hours in the drafting-room. There is a specified amount of work to accomplish for which credit points are given at completion. The drafting-room is open all day and is always occupied. It is desired to have the student work there steadily five hours a day. The average student can complete his work in that time.

PROGRAM IN DESIGN.

FIRST YEAR.

SUBJECTS First Term	Hours a Week	See for Description Page	Course	SUBJECTS Second Term	Hours a Week	See for Description Page	Course
English	3	26	I	English	3	26	I
El. of Arch.	8	22	I	El. of Arch.	8	22	I
Construction	4	19	I	Construction	4	19	I
Hist. of Arch.	2	18	I	Hist. of Arch.	2	18	I
Drawing	2	25	Ic	Drawing	2	25	Id
Des. Geom. Shades and Shadows	1	24	III	Perspective	1	24	III

SECOND YEAR.

English	3	26	II	English	3	26	II
Design	8	22	II	Design	8	22	II
Construction	3	20	II	Construction	3	20	II
Hist. of Arch.	2	18	II	Hist. of Arch.	2	18	II
Drawing	2	25	IIa	Drawing	2	25	IIa
Graphics	2	30	I	Graphics	2	30	I
The'y of Des.	1	22	VII				

THIRD YEAR.

Elective	4			Elective	4		
Design	8	22	III	Design	8	22	III
Construction	1	20	III	Construction	1	20	III
Hist. of Ornament	2	18	III	Hist. of Sculpture	2	18	IV
Drawing	2	25	IIb	Pen and Ink	1	26	VII
Heat and Ventilation	2	21	V	Water Color	1	26	V
				Sanitation	2	21	VI
Electricity	1	21	VII	Church Des.	1	23	VIII

FOURTH YEAR.

Elective	4			Elective	4		
Hist. of Painting	2	19	V	Bus. Ethics	2	27	I
Drawing	1	25	III	Modeling	2	25	IV
Drawing	1	26	VI	Design (Thesis)	10	22	IV
Design	10	22	IV				

At the beginning of the First Year the student matriculating for the Program in Design may, with the consent of the Faculty, elect a Major in Mathematics instead of the Major in English. The Mathematics courses for the four years will be as follows: Algebra, I; Analytic Geometry, II; Calculus, III, IV, V; Physics, II, III; Analytic Mechanics, VIII; Mechanics of Materials, X.

At the beginning of his Third Year, the student following the regular Program in Design may, if his proficiency in English warrants it, elect to follow during the Third and Fourth Years one of the following courses: English, Philosophy, Political Science, History, French or German. He may not, however, elect a course in the same language that he offered for credit at matriculation. If the above election is denied the student, he must continue his work in English for one or two years more as may decided by the Faculty.

PROGRAM IN ARCHITECTURAL ENGINEERING.

FIRST YEAR.

SUBJECTS First Term	Hours a Week	See for Description Page	See for Description Course	SUBJECTS Second Term	Hours a Week	See for Description Page	See for Description Course
Algebra	5	30	I	Anal. Geom.	5	31	II
Des. Geom.	3	27	I	Des. Geom.	3	27	I
Construction	4	19	I	Construction	4	19	I
Shades and Shadows	1	24	III	Perspective	1	24	III
Drawing	1	24	I	Drawing	1	24	II
Drawing	1	25	Ic	Drawing	1	25	Id
El. of Arch.	8	22	I	El. of Arch.	8	22	I

SECOND YEAR.

Calculus	5	31	III	Calculus	5	31	IV,V
Physics	5	32	II,III	Physics	5	32	II,III
Construction	4	20	II,III	Construction	4	20	II,III
Design	7	22	II	Design	2	25	II
Drawing	2	25	IIa	Drawing	7	22	IIa
Theory of Design	1	23	VII				

THIRD YEAR.

Anal. Mechan.	5	28	VIII	Anal. Mech.	2	28	VIII
Sanitary Eng.	2	29	XIII	Mechanics of Mat'ls	3	28	X
Electricity	1	21	VII	San't'ry Eng.	2	29	XIII
Heating and Ventilating	2	21	V	Surveying	3	27	II,III
Hist. of Arch	2	18	I	Hist. of Arch.	2	18	I
Struc. Design	8	23	V	Struct. Des.	8	23	V

FOURTH YEAR.

Arch. Eng.	2	20	IV	Arch. Eng.	3	20	IV
Bridges and Roofs	5	29	XIV	Graphics	5	30	XV
Stereotomy	3	24	VI	Hist of Arch.	2	18	II
Hist. of Arch.	2	18	II	Bus. Ethics	2	27	I
Struct. Design	8	23	VI	Struct. Des. (Thesis)	8	22	VI

SHORT PROGRAM.

FIRST YEAR.

SUBJECTS First Term	Hours a Week	See for Description Page	See for Description Course	SUBJECTS Second Term	Hours a Week	See for Description Page	See for Description Course
Hist. of Arch.	2	18	I	Hist. of Arch.	2	18	I
Construction	4	19	I	Construction.	4	19	I
Des. Geom.			III	Perspective	1	24	III
Shades and Shadows	1	24		Drawing	1	25	Id
				Pen and Ink	1	26	VII
Drawing	1	25	Ic	El. of Arch.	4	22	XV
El. of Arch.	12	22	I	Design	8	22	II
				Theory of Des.	1	23	VII

SECOND YEAR.

Hist. of Arch.	2	18	II	Hist. of Arch.	2	18	II
Construction	4	20	II,III	Construction.	4	20	III
Graphics	2	30	I	Graphics	2	30	I
Heat. and Ventilation	2	21	V	Sanitation	2	21	VI
					1		
Electricity	1	21	VII	Bus. Ethics	2	27	VI
Water Color	1	26	V	Drawing	4	25	IIa
Drawing	4	25	IIa	Modeling	2	25	IV
Design	8	22	III	Design	8	22	III
					1	23	VII

COURSES OF INSTRUCTION

ARCHITECTURE.

I AND II.

HISTORY OF ARCHITECTURE. This course includes a study of history, manners, customs, politics and religion as well as of the Architecture of Egypt, Assyria, Greece and Rome. It takes up the rise and development of Christianity and the Christian types—Basilican, Romanesque; Byzantine and its Mohammendan offshoots; Gothic and Renaissance in all their phases. Some attention is paid to Indian, Chinese and Japanese styles. A comprehensive review is made of American work. In seminar the course is completed by a study and discussion of the various phases of "The New Art", both abroad and in the United States.

Instruction is by text-book, lectures, readings and research.

Text-book, *Hamlin, Sturgis.*

[Two hours a week for four terms.]

III.

HISTORIC ORNAMENT. A study of the origin and evolution of all styles of ornament, and of its application to architectural forms, appurtenances and objects of art.

Instruction by text-book, lectures, readings, and drawings in various media.

In drawing fifteen plates are required.

Text-book, *Glazier.*

[Two hours a week for one term.]

IV.

HISTORY OF SCULPTURE. A brief historical review of ancient and modern sculpture.

Instruction by text-book, conference and research.

Text-book, *Marquand and Frothingham.*

[Two hours a week for one term.]

V.

HISTORY OF PAINTING. A brief historical and critical review of Painting.

Instruction by text-book, conference and research.

Text-book, *Van Dyke.*

[Two hours a week for one term.]

CONSTRUCTION.

I.

In this course the student obtains a thorough knowledge of the materials and methods of masonry, carpentry, roofing, metal-working, painting. Each trade is considered separately, and at conclusion an exhaustive study of specification writing and methods of estimating for it is made. 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.

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 regularly, as a supplementary exercise in superintendence, to important building operations in the neighborhood.

Instruction is by text-books and lectures.

Fifteen points must be made in inspections and drawings.

Text-books, *Kidder's Building Construction Vols. I, II; Kidder's Handbook.* Supplementary, *Sweet's Index.*

[Four hours a week for two terms.]

II.

A thorough study of foundation work—caissons, piles, grillage, spread and stepped footings; fire proofing of all forms; the design and construction of steel framing.

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 First Year students.

Instruction is by text-books and lectures. Eight points must be made in inspections and drawing.

Text-books, *Kidder,* Vol. I; *Frietag;* Supplementary—*Sweet's Index, Carnegie* and *Bethlehem "Millbooks."*

[Three hours a week for two terms.]

III.

A study of Reinforced Concrete; Elevators; Power plants for buildings.

Instruction by text-book and lectures.

Five points must be made in inspections and drawings.

Text-books, *Watson;* Supplementary, *Sweet's Index,* Concrete Handbooks.

[One hour a week for two terms.]

IV.

ARCHITECTURAL ENGINEERING. A course in which the student is taught to solve graphically and analytically more complicated problems in structural design and applied mechanics. Shoring, underpinning, retaining walls, jointed trusses, arches, vaults and domes are the more important topics.

Instruction is by text-book. Twelve points must be made in inspections and drawing.

Text-books, *Kidder, Vols. I, III; Wittmann.*

[Two hours a week for one term, three hours a week for one term.]

V.

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 are some of the topics considered in this study.

Instruction by text-book and lectures.

Text-book, *Carpenter.*

[Two hours a week for one term.]

VI.

SANITATION. The following are topics covered in this course: The carrying away of surface water and wastes from the building; pipes and fittings; one and two-pipe roughing-in systems; traps; domestic water supplies; pumping engines; heating of water for domestic purposes; plumbing fixtures.

Instruction is by text-book and lectures.

Text-book, *Cosgrove.*

[Two hours a week for one term.]

VII.

ELECTRICITY. Laboratory and lectures on the uses of electricity in buildings, systems of wiring, materials used, the underwriters' requirements, study of bells, telephones, electric lighting, photometry and illumination.

[One hour a week for two terms.]

DESIGN.

I.

ELEMENTS OF ARCHITECTURE. This is a course of drawing. Thirty-two plates of standard size (or their equivalent) will be made during the year. They will consist of measured drawings of the Roman and Greek orders, of the various details associated with them and of simple problems involving their use; of lettering; of exercises in wash and color; and of studies in shades and shadows and perspective.

Each plate will be examined by the Professor in charge, and may be marked "Pass," "Mention," or "Highest Mention," counting ½, ¾ or 1 point, respectively. All plates must be drawn and at least fifteen points registered.

Instruction is by text-book.

Text-books, *Ware, von Mauch, McGoodwin.*

[Eight hours a week for two terms.]

II, III AND IV.

These courses are the most important on the program. In the solving of the problems the student makes use of every item of information that he has acquired in all his other class-work, for the aim of the instruction in design is, primarily, practicability. The planning is straight-forward, logical and direct;—the design is powerful, simple, and expressive. The method is criticism. The means are major and minor problems of varying degrees of difficulty varying from a masonry gate-post to the most monumental projects. These problems are stated in programs that are made definite and practical and as like actual conditions as possible. A recent problem was a public bath and reading room on an irregular shaped parcel of ground in the neighboring city. The students surveyed the ground before beginning the sketches.

Second year men are required to execute eight minor and eight major problems; third year men, eight minor and six

major problems; and fourth year men, four minor and three major problems and the thesis.

These designs are criticised by the Professor in charge, or by some able architect especially invited. They may be marked "Pass," "Mention," or "Highest Mention," counting ½, ¾ or 1 point respectively for minor problems, and 2, 3 or 4 points for major problems.

Fifteen points must be registered in second year design, as many in third year design, and eight in fourth year design before thesis work is started.

[Eight, eight and ten hours a week, respectively, for three years.]

V, VI.

STRUCTURAL DESIGN. These courses have the same relative importance as the courses in design. The analogy goes further, the work is given as major and minor problems of varying degrees of difficulty and is judged and marked in the same manner. The scope of the problems will vary from the making of an ordinary footing plan to the framing of the structural steel work of a large dome.

The amount of work and the points required to be registered is the same for the same year as given under *Design II, III, IV.*

[Eight hours a week for three years.]

VII.

THEORY OF DESIGN. A thorough study of the principles of planning and proportion supplemented by study of the perfection and faults of the world's most famous buildings.

Instruction by text-book and lectures.

Text-book, *Robinson.*

[One hour a week for one term.]

VIII.

CHURCH DESIGN. This course is conducted by means of lectures and research. It includes the arrangement of sanctuaries, sacristies and baptisteries as affected by liturgical needs. The subject of church furniture and accessories is also discussed.

[One hour a week for one term.]

DRAWING, MECHANICAL.

I.

FREEHAND. This course consists of sketching with pencil and pen from flat copies and models 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 projection, 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.

[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 the 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, construction, foundations, dams, piers, abutments, culverts and arches. Text-book, *French.*

[Three hours a week for one term.]

DRAWING, FREEHAND AND MODELING.

I.

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

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

(*c*) Drawing from architectural elements, architectural ornaments such as pedestals, bases, shafts, cornices, etc.

(*d*) Drawing from casts of the human figure; hands, feet, masks, etc. 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.

(*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.

III.

LIFE CLASS. Drawing from life. Sketching from the costumed model. Still life painting in water colors. Landscape painting.

IV.

MODELING. The objects modeled are architectural forms copied from the cast or made from the student's drawings of his own work, as his progress and ability may warrant.

[Two hours a week for one term.]

V.

WATER COLOR. Drawing in water color from still life and nature.

[One hour a week for one term.]

VI.

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.]

VII.

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.]

ENGLISH.

I.

(*a*) *Sheran's Handbook of Literary Criticism.*

[Three hours a week for fourteen weeks.]

(*b*) ESSAY AND ORATION. Intensive study

[Three hours a week for twelve weeks.]

(*a*) *Sears' Methods and Principles of Criticism.*

[Three hours a week for ten weeks.]

Practice in writing in all literary forms and assigned readings.

II.

(*a*) *Sheran's Handbook of Literary Criticism.*

[Two hours a week for fourteen weeks.]

(*b*) Catholic Authors.

[One hour a week for fourteen weeks.]

(*c*) POETRY AND THE POETS. Texts, theory and critical study. *Page's American and English Poets. Corson's A Primer of Verse.*

[Three hours a week for twenty-two weeks.]

Practice in writing in all literary forms and assigned readings.

BUSINESS ETHICS.

I.

In this course is 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.

Instruction is by text-book and lectures.

Text-book, *Wait.*

[Two hours a week for one term.]

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; 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.]

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

[Five hours a week for first term. Two hours a week for second 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 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 sub-

jects 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.*

[Three hours a week for one term.]

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 system compared; pollution of rivers; chemical precipitation; results and costs of purification; general municipal and domestic sanitation; inspection of neighboring work. 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.

GRAPHIC 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 methods 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.]

GRAPHICS

I.

An elementary study of graphic statics. Forces, resultants; center of gravity, moment of inertia; buttresses; beams; truss loadings under snow and wind; truss construction. For students in Design Program.

Instruction by text-book and lectures.

Text-book, *Kidder Vol. III, Ricker, Sondericker.*

[Two hours a week for two terms.]

MATHEMATICS.

I.

ALGEBRA. This course includes a study of the binomial thereom, 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, bi-quadric equations, Des Cartes' and Cardan's rules; Sturm's theorem; Horner's method. 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, different systems of coordinates; transformation of coordinates; an elementary course in geometry of three dimensions, embracing the point, straight line, plane and spherical surfaces of revolution; transformation of coordinates; quadric surfaces and supplementary propositions. Text-book, *Bailey and Woods.*

[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 of the methods for the differentation 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; maxima and minima of functions of one independent variable, and of several independent variables; tracing curves; differentials af arcs, plane areas, surfaces and volumes of revolution. Text-book, *Osborne.*

[Five hours a week for one term.]

IV.

CALCULUS, INTEGRAL. Integration of elementary form 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.]

PHYSICS.

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. Text-book, *Crewe.*

[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.]