Department of Architecture Circular 1890

MASSACHUSETTS

INSTITUTE OF TECHNOLOGY.

COURSE IV.

DEPARTMENT OF ARCHITECTURE.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

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The Faculty of the Massachusetts Institute of Technology has determined, after the present year, to discontinue the "Partial Course in Architecture." This year, 1890, students may, as heretofore, enter this course, which will be continued for them during the two following years; but in 1891, and after, the entrance examinations will be for the regular course only, except in the case of students who may be already qualified for advanced standing in the department. Such "special" students should have had at least two years' experience in an architect's office, or be over twenty-four years of age, or be graduates of colleges; and must show thorough preparation in Mechanical and Freehand Drawing. All other "specials" will be called upon to pass the entrance examinations, as well as those in Mechanical and Freehand Drawing. On entering the department, "special" students will be permitted to take any studies for which they shall show themselves qualified. At least four subjects must be taken.

The studies and exercises of the course in Architecture have been carefully selected and arranged, that those who graduate shall be liberally educated, and shall possess a thorough professional training. During the entire course, therefore, studies have been introduced which are directed toward the student's mental development, and his knowledge of letters, language, politics, and history, as will be seen by reference to the detailed scheme of instruction appended to this circular. The most important elements of this general training are: German, two years; French, two years (following the admission requirement of ability to read French); General Chemistry, one year; Political Economy; English Literature; Business Law; Theme Work; History of the Renaissance and of the Reformation; Geology; and Sanitary Science.

In the strictly professional work, great stress is laid upon the student's acquisition and mastery of the principles that underlie sound construction. To the work in the Draughting Room and in the Laboratory of Applied Mechanics, is added the examination of buildings actually in course of construction, to enable the student intelligently to deal with problems in architectural practice. The cultivation of the student's taste in color and in form is accomplished by the solution of varied problems in the art of design, by the study of the History of Architecture and the History of Ornament, and by practice in Water-Color and Freehand Drawing.

The proportion in which the time of the student is divided between studies and exercises in one or another of these subjects is a matter to which the judgment of the Faculty has been especially directed. In general, it may be said that the proportion of the time allotted to non-professional studies steadily diminishes during the successive years of the course, which allows an increased number of hours during each year for practice in Original Design. In the first year, the studies that have a distinct professional bearing are Algebra, Solid Geometry, and Plane Trigonometry, requiring four and one half hours a week recitation, and about nine hours a week preparation; and Mechanical and Freehand Drawing extending over seven hours a week throughout the year. The remainder of the time is devoted to studies of a general nature.

Only those students of the first year who attain high rank in Drawing, Geometry, and Trigonometry, as well as satisfactory standing in other studies, are admitted to the second year, in which begins the strictly professional work of the course.

The subjects of the second year include Analytic and Descriptive Geometry, Differential Calculus, and Physics; Architectural History is taught by text-book and lectures; and the students are required to make tracings from the large collection of books and photographs in the library of the department. During the first term is drawn a series of plates, which are explained by lectures, to familiarize the students with the proportions and correct use of the classic orders, arcades, balustrades, and other architectural details. And in connection with this work is the study of Shades and Shadows. In the second half-year, the knowledge thus acquired is employed in making original designs from a series of given programmes. Instruction in Materials is given by lectures, by text-books, and by visits to buildings in process of erection.

During the third year the general training becomes somewhat less

prominent, the professional work more so. The mathematical work is continued with Integral Calculus, followed by Theoretical and Applied Mechanics; the study of Physics is completed, and that of Stereotomy taken. The previous term's work in Design is resumed, with programmes of increased difficulty, while practical instruction is carried on by lectures and exercises in making the framing plans and working drawings of various sorts necessary in actual practice.

The instruction in Design is arranged as carefully as possible to occupy the allotted time to the best advantage. Every month two problems are assigned to each class: one, a sketch problem, which must be worked out, effectively rendered, and finished within one week; the other, a more difficult problem, for the thorough working out in detail of which the entire month is allowed. To accustom the students to concentrate their minds upon the development of a single idea, instead of wasting their energy in the successive adoption and abandonment of different solutions of the given problem, two days are allowed after the posting of the programme for the month, within which each student must fix upon some general scheme for his design, and show it in plan and elevation on a small scale. These preliminary sketches are attached to the completed designs; and judgment is passed upon the drawings by a jury from the Boston Society of Architects. These drawings are afterwards criticised in the presence of the students of the department, and a few of the most deserving designs are indicated by cards of honorable mention. The others are marked by the instructors according to their merit, and twice yearly returns are made to the parents of the students.

In the fourth year the instruction in Applied Mechanics, under Professor Lanza, takes a special direction, including investigations into the stability of structures and the resistance of materials; and each successive class participates in a series of original determinations of the strength of various materials and frames, the results of which have already greatly modified the formulæ used by architects and engineers. Graphical Statics, treated only in theory in the third year, is resumed, and considerable practice is given in designing trusses, in methods of uniting the various members, and in the use of handbooks for deciding the proper sizes of materials in wood and iron. In this connection is considered the construction of domes, arches, and buttresses. In Heating and Ventilation is given a technical course, which is illustrated by the study of the principal public buildings in the city. During this year, also, the instruction in Design is continued in the same way as before. The degree of skill

obtained by two years' previous practice is such that programmes of an important character are generally treated creditably, and often with distinct success. Studies in planning give the student opportunity to enlarge his resources in work of this character; and particular attention is paid to special classes of buildings, such as schools, theatres, churches, and hospitals. The careful study required for the final thesis serves to fix some good example in the memory.

The long drill in Original Design would be somewhat barren, if means were not taken to supply ample stores of fresh material and to cultivate the taste. For this purpose the library of the department is freely used. As soon as a programme for design is posted, the instructors direct the students to books, photographs, and drawings from which examples of the solution of similar problems, or suggestions as to treatment, detail, or decoration, may be obtained; and an effort is made to collate as many examples as possible, to increase the resources, and to promote originality. Facility in rendering is also taught, by a course in Water-Color Sketching, given by Mr. Ross Turner, to which the students may add extra hours of practice. A course in Color Decoration, extending through the fourth year, is given by Mr. C. Howard Walker. To each of these exercises is allotted four hours, by which a view is gained, not only of the historical sequence of styles of ornament, but facility in the general treatment of color in decoration, and in the characteristics of different styles. As a further equipment of the student for professional work, an independent series of lessons in Pen and Ink Sketching, arranged to extend through three terms, is given by Mr. D. A. Gregg. In this year, Iron Construction, in its application to the modern fireproof structure, is an important course. Lectures on Business Law, Contracts, etc., prepare the student for the approaching responsibility of practice. The History of Painting and Sculpture is taught at the Art Museum, where the student is brought into contact with the subject discussed.

All the above work is required, but opportunity is given for improvement in a similar direction during the leisure hours of the day. An evening Life Class is maintained, at the expense of the Institute, during the greater part of the school year, under the charge of the officers of the department, while sketching, both in and out of doors, is encouraged. Much benefit is derived from the kindness of the Trustees of the Boston Museum of Fine Arts, by whose liberality the admirable collections of the Museum are always open, free of expense, to students of the department. During the second and third

years the regular exercises in Freehand Drawing from the cast are held there.

In providing for so large a proportion of strictly artistic training in the course in Architecture, the Faculty has been guided by the consideration that in their future professional career the students are likely to need, in about equal proportions, scientific knowledge in the conduct of construction, and skill in disposition and design; and the scheme of studies is based upon the belief that the attainment in a high degree of both these qualifications is quite within the capacity of intelligent young men, who pursue a four-years' course of study with diligence and fidelity.

This course aims to prepare its pupils, not only for their years of work as subordinates, when rapidity, skill, and taste in drawing and design, with knowledge of detail, will be the most useful qualifications, but also for their subsequent independent career, when the value of technical knowledge will become most important.

COURSE IN ARCHITECTURE.

FIRST YEAR.

First Term.	Second Term.
Algebra.	Algebra.
Solid Geometry.	Plane Trigonometry.
General Chemistry: Lectures and Laboratory Work.	General Chemistry: Lectures and Laboratory Work.
History of the English Language.	Political History since 1815.
English Composition.	French.
French.	Mechanical and Freehand Drawing.
Mechanical and Freehand Drawing.	Military Drill.
Military Drill.	

SECOND YEAR.

First Term.	Second Term.
Shades and Shadows.	Materials.
Freehand Drawing.	Freehand Drawing.
The Orders.	Pen and Ink.
Analytic Geometry.	Architectural History.
Physics.	Perspective.
Descriptive Geometry.	Differential Calculus.
Political Economy.	Physics.
German.	English Literature.
	German.
	Design.

THIRD YEAR.

First Term.	Second Term.
Architectural History.	Freehand Drawing.
Freehand Drawing.	Pen and Ink.
Pen and Ink.	Specifications and Working Drawings.
Design.	Design.
Specifications, Working Drawings and Framing.	Water Color.
Integral Calculus.	Kinematics and Dynamics.
General Statics.	Strength of Materials.
Structural Geology.	Stereotomy.
Physics.	German.
German.	Business Law.
English.	English.

FOURTH YEAR.

First Term.	Second Term.
Design.	Design.
History of Ornament.	History of Ornament.
Water Color.	Water Color.
History of Construction.	Advanced French.
Strength of Materials.	Sanitary Science.
Ventilation and Heating.	Modelling.
Advanced French.	Iron Construction.
Sanitary Science.	History of the Renaissance.
History of the Renaissance.	Business Relations, Contracts, etc.
Acoustics.	History of Painting and Sculpture.
Graphical Statics.	Thesis Work.

INSTRUCTORS HAVING SPECIAL CHARGE OF THE COURSE IN ARCHITECTURE.

FRANCIS W. CHANDLER, Professor of Architecture. In general charge of the Department, and Lecturer on
Materials, Construction, Planning, and Special Classes of Buildings.

EUGÉNE LÉTANG, Associate Professor of Architecture.
Design.

ELEAZER B. HOMER, S. B., Assistant Professor of Architecture.
History of Architecture, Orders and Architectural Forms, Shades and Shadows, Stereotomy, Graphical Statics and Second Year Design.

W. H. KILHAM, S. B., Instructor in Architecture.

ROSS TURNER.
Instructor in Sketching and Water Color.

C. HOWARD WALKER.
Instructor in the History of Ornament.

CHARLES R. CROSS, S. B., Thayer Professor of Physics.
Physics.

GAETANO LANZA, S. B., C. E., Professor of Theoretical and Applied Mechanics.
Applied Mechanics and Strength of Materials.

LINUS FAUNCE, S. B., Assistant Professor of Drawing.
Instrumental Drawing and Descriptive Geometry.

CHARLES L. ADAMS, Instructor in Freehand Drawing.
Freehand Drawing.

S. Homer Woodbridge, A. M., Instructor in Physics.
Heating and Ventilation.

Ernest Major.
In charge of the Life Class.

D. A. Gregg.
Instructor in Pen and Ink Sketching.