

Mechanical: Isometric projection; intersection of solids and development of surfaces; architectural working drawings; elementary perspective; projection of shadows; machine drawing; lettering and borders.

Third Year.—Freehand: Drawing from cast in charcoal and pencil; decorative art work; pen sketching and shading; perspective; designing.

Mechanical: Machine design and construction; perspective; shades and shadows; geometric problems. A finished drawing with full details, embodying all that the pupil has learned in drawing.

Clay-modelling.

This work is done the first half of the second year, and consists of modelling from casts, plant-forms, carvings, and designs. It is intended to give the pupils along with this work a knowledge of the modelling of the various styles of relief-decoration, such as the Greek, Roman, Romanesque, and Renaissance. Also, in modelling from plant-forms, to teach the pupil to see broadly, and, while getting the character of the leaf or flower, to eliminate the non-essentials and those features impossible of reproduction in plastic form.

Manual Work.

In disciplinary value the manual work rises to the dignity of laboratory-work, and holds equal rank with the regular academic studies. It embodies a training in habits of careful, patient, systematic, intelligent labour. The pupil is made to feel from the beginning the necessity for planning his work with the utmost care and exactness in order to secure accurate results. All exercises made in the shop must agree precisely in form and dimensions with the drawing; usually in the form of a blue print, with which each pupil is provided. Each exercise is carefully planned to embody some definite mechanical principle, and to bring into use, one after another, the various shop tools. The shop teacher explains the construction and use of each tool as it is needed and gives directions for its care. Then in the presence of the class he shows exactly how to perform the work, and also occasionally, by way of a caution, "How not to do it." Economy of time, labour, and material is taught and enforced by careful supervision. Special attention is given to the formation of habits of neatness and order, and to the employment of workmanlike methods.

For boys the work is as follows:—

First Year.—Joinery, turning, carving: In the joinery course only hand-tools are employed, the object of the course being to give practice in the use of the principal wood-working tools, and teach the elementary principles of construction. The course in wood-carving affords instruction in the use of the principal wood-carving tools, and a further training in appreciation of beauty of form in design. After the work at the bench, wood-turning is taught. No kind of shop-work is more fascinating to the student, or presents a greater opportunity for developing an appreciation for grace, symmetry, and beauty in form. Throughout the year frequent talks are given by the instructor upon such topics as these: Distribution of forests; processes of lumbering; the principal varieties of wood and their leading uses; physical properties of wood; its behaviour under various conditions; its proper distribution in construction; preservation of timber, &c.

Second Year.—Pattern-making, moulding, forging: Some foundry-work precedes the pattern-making in order that the student may better understand the construction of patterns. The course in pattern-making will consist in plain work; pulley-, pipe-, gear-, and core-work. In the foundry the students are taught to make moulds and cores, each student pouring for himself into the moulds that he has made.

Forging: Exercises in drawing, upsetting, shaping, bending, welding, punching, and cutting, hardening, and tempering of steel. During the course each student forges and tempers a set of steel-lathe tools, to be used in the shop-work of the following year.

A short course in ornamental ironwork closes the year's work.

Third Year.—Vice-work and machine-tool work: The vice-work includes chipping, surface-filing, straight, angular, and round fitting, scraping, and finishing. The machine-tool work is designed to teach the uses of the most common machine-tools and the elementary principles of machine construction. It consists of a series of graded exercises involving the uses of the lathe, drill, planer, shaper, milling- and grinding-machines, and will include work in cast- and wrought-iron, steel, and brass. The ground covered may be summarised as follows: Lathe-work, consisting of centring, drilling, and countersinking, straight and taper turning, chuck-work and screw-cutting, also hand-turning, filing, and polishing. Planing and shaping, including the production of both plane and curved surfaces, and key-seating. Straight and spiral milling, includes key-seating, gear-cutting, and the fluting of taps, drills, and reamers. Grinding and fitting, including the sharpening of milling cutters and reamers, and the grinding of hardened steel arbors and gauges. During the year some project such as a small motor, dynamo, steam-engine, or machine-tool is constructed.

Manual Work for Girls.

First Year.—Sewing, joinery: Instruction and practice is given in all the important varieties of plain sewing by hand, including mending and darning, also drafting and cutting patterns of undergarments. Lectures are given by the teacher upon the nature and manufacture of the materials used in the work. Local mills and factories are visited by the classes. From January to June joinery alternates with the sewing. This work is intended to familiarise the girls with the principal wood-working tools and elementary constructive principles, and thus serve as a basis for their work in wood-carving in the following year.

Second Year.—Sewing, wood-carving: Cutting and fitting garments, care and use of the sewing-machine, instruction in selecting and purchasing materials. From January to June wood-carving alternates with sewing. Instruction is given in correct methods of handling wood-carving