

Workshop Practice II (b)

(See note heading syllabus in this subject in second year of course)

The syllabus of work to be attempted is set forth in the following sections :—

- (1) The marking off, setting up, and machining in a lathe, of a casting, forging, or fabricated part requiring at least two settings for accurate relationship of bores or surfaces. At least one of the operations should require the use of face and angle plate.
- (2) Layout of operations, and setting-up of a typical multi-tool capstan or turret lathe, for the production of a part requiring, as far as possible, full use of the tooling available. Either collet or chucking capstan would be suitable.
- (3) Machining to appropriate limits a number of parts forming an assembled unit, such as a "tool-maker's jack," embodying as many as possible of the following operations: surfacing, facing, recessing, boring and screw cutting (internal and external). The parts should be, as far as possible, of different materials.
- (4) The machining of a component on a universal milling-machine in which a variety of operations and cutters is used. The work should include indexing and, if possible, some spiral milling.
- (5) The grinding of a component on a cylindrical grinding machine, fitted with internal grinding attachment, in which internal and external grinding of parallel and taper work to toolroom limits is required, or, alternatively, work of equivalent standard on a surface grinder or tool and cutter grinder.
- (6) The machining of a component (steel or cast iron), such as a simple milling fixture, requiring the following operations: planing or shaping, drilling, reaming, and counterboring.
- (7) The assembly of a mechanism requiring accurate alignment, the fitting of bearings, and various drilling, reaming, tapping, and dowelling operations.
- (8) The production of a set of workshop gauges comprising plug, gap and recess limit gauges, for checking a component to British standard specifications and recommendations. Suitable gauge blanks should be provided, but all heat treatment and finishing processes should be carried out.
- (9) Manufacture of a simple press tool, such as a "drop-through" type blanking tool with fixed stripping plate.

The syllabus covers a wide range of operations, and, although it may not be possible to treat it completely in the time allowed, it is recommended that as much as possible should be attempted.

There will be no examination in this subject, but a candidate in the subject will be required to present a certificate from the Principal of the institution attended that he has carried out a course of practical work of at least thirty hours' duration based on the above prescription and that his attendance and work have been satisfactory.

Workshop Technology

(1) *Materials*.—The composition, physical properties, and engineering uses of the more common metals and their alloys, such as cast iron, wrought iron, malleable iron, mild steel, medium-carbon steel, copper, gunmetal, brass, phosphor bronze, bearing metals, and light alloys.

Tool steels, carbon and high-speed steels, and special tool alloys; their suitability for different kinds of tools.

Market forms of supply and relative costs—e.g., castings, forgings, drop forgings, bars, sheets, plates, rods, wire.