**SYLLABUS**

**Machining Trade**

**(Machinist Trade & Turning Section) (6 Hrs)**

**Theoretical Instructions:**

Safety Precautions, Introduction of machine tools such as lathe, Drilling machine & other related metal cutting tools. Parts of lathe & basic metal cutting operations. Introduction of various types of cutting tools (Nomenclature) and their material

**Practical Demonstrations:**

Demonstration on Lathe & basic operations such as drilling, facing, turning, taper turning, step turning, knurling, chamfering etc. Demonstration of basic measuring instruments.

**Job No. 1: TO MANUFACTURE A JOB ON THE CENTRE LATHE AS PER GIVEN DRAWING.**

**Job No. 2: TO PERFORM ADDITIONAL OPERATIONS SUCH AS GROOVING, DRILLING, KNURLING on Job No. 1.**

**Sheet Metal & Spray-Painting Section (6 Hrs)**

**Theoretical Instructions:**

Safety precautions, brief introduction of sheet metal, various tools, joints & operations. Soldering, brazing, & shearing, Fluxes & their applications. Introduction of different machines and pattern development in detail. Brief description of paints & varnishes.

**Practical Demonstrations:**

Demonstration of all basic hand tools & equipment’s. Fabrication of simple joints and jobs. Preparation & painting of surfaces for varnish & painting etc.

**Job No. 1: TO DEVELOP A CYLINDRICAL JOB.**

**Job No. 2: TO DEVELOP A SQUARE ELBOW WITH SOLDERINGAS PER THE DRAWING.**

**Fitting & Benchwork Section (6 Hrs)**

**Theoretical Instructions:**

Safety precautions, introduction to fitting & bench work. Demonstration of basic hand tools, holding devices and basic fitting operations such as measuring, marking, filing, sawing. drilling, tapping, buffing.

**Practical Demonstrations:**

Demonstration of all basic hand tools/ measuring tools & equipment’s. Demonstration of simple operations such as marking, punching, filing, sawing, scrapping, drilling.

**Job No. 1: TO FABRICATE A SQUARE PLATE OF MILD STEEL WORK PIECE 50X50X7mm.**

**Job No. 2: TO ASSEMBLE THE MILD STEEL WORK PIECE WITH SNAP FITTING.**

**(6 Hrs)**

**Welding Section (6 Hrs)**

**Theoretical Instructions:**

Safety Precautions, Introduction of welding processes like electric arc welding, Gas Welding, MIG Welding, TIG welding, Submerged arc welding & spot welding. Various Fluxes & electrodes used in welding. Introduction of ac & dc welding and its applications.

**Practical Demonstrations:**

Demonstration of all basic tools &personal protective equipment’s. Demonstration of different types of joints by using arc welding & gas welding etc.

**Job No.1: TO MAKE A SINGLE-V BUTT JOINT OF MILD STEEL 80x50x8mm**

**Job No.2: TO MAKE A LAP JOINT OF MILD STEEL 85x35x6mm**

**Smithy & Forging Section (6 Hrs)**

**Theoretical Instructions:**

Safety precautions, introduction of forging tools. Materials & their heat treatments. Description of all forging operations such as hand forging, upsetting, drawing & punching. Introduction of various forging methods. Comparison of hot & coldworking.

**Practical Demonstrations:**

Demonstration & practice of different smithy operations like forging, cutting, punching, bending etc. Demonstration & practice of MS rod into forged MS ring & octagonal cross section.

**Job No. 1: TO PREPARE MS-SQUARE20X20MM FROM MS ROUND BY USING DIFFERENT FORGING HAND TOOLS.**

**Job No. 2: TO PREPARE A SQUARE HEADED BOLT FROM MS-ROUND60x30mm**

**Carpentry & Pattern Making Section (6 Hrs)**

**Theoretical Instructions:**

Safety Precautions, Introduction of carpentry & joinery, different tools used in carpentry. Seasoning of wood and defects of wood. Various types of joints. Brief description of wood working machines and patternmaking.

**Practical Demonstrations:**

Demonstration & practice of different carpentry operation like Planning, sawing & chiselling and joints. Demonstration of pattern making tools & materials.

**Job No. 1: TO PREPARE HALF LAP CROSS JOINT.**

**Job No. 2: TO PREPARE A BRIDLE JOINT.**

**List of recommended books: -**

1) Workshop Technology by W. A. J. Chapman

2) Workshop Technology by [Choudhury H S K](https://www.amazon.in/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Choudhury+H+S+K&search-alias=stripbooks)

3) Workshop Practice by Swarn Singh

4) Workshop Technology by Virender narula