**RJLB Govt. Polytechnic, Loharu**

***LECTURE PLAN (FEB.2024 - JUNE 2024)***

**BRANCH:** ME **SEMESTER: 2nd**

**SUBJECT:** WT-I

**NAME OF FACULTY**: ANKIT PANGHAL

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| **S.**  **No.** | **Name of Topic** | | **No. of Lectures** |
| **Chapter -1- Hand Tools** | | | |
| 1 | | Chisels – Types and uses of chisels, wood working chisels, metal working chisels – cold chisel, hard chisel, stone chisel, masonry chisel. | 2 |
| 2 | | Hammers – Types, Basic design and variations, Physics of hammering, Hammer as force multiplier, effect of head’s mass, effect of handle. Saw – Saw terminology, types of saws, types of saw blades, material used for saw, | 2 |
| 3 | | Hacksaw frame and its types. Pliers – Function and types. Wrenches/ Spanners – Common General wrenches/spanners, Specialized wrenches/spanners, Surface plate, V block, files, Surface Gauge. | 2 |
| **Chapter –II-**  **Measuring Instruments** | | | |
| 1 | | Calipers – Types – Inside, outside, divider, Odd leg caliper. Vernier Caliper- Parts, uses, checking error, least count, working principle. Outside micrometer - Introduction, parts, Principle, Least count, Checking zero error. | 2 |
| **Chapter –III- Cutting Tools and Cutting Materials** | | | |
|  | | Cutting Tools - Various types of single point cutting tools and their uses, Single point cutting tool geometry, tool signature and its effect, Heat produced during cutting and its effect, Cutting speed, feed and depth of cut and their effect.  Cutting Tool Materials - Properties of cutting tool material, Study of various cutting tool materials viz. High-speed steel, tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond. | 2  2 |
| **Chapter -IV- Welding** | | | |
|  | | **Welding Process** - Principle of welding, Classification of welding processes, Advantages and limitations of welding, Industrial applications of welding, Welding positions and techniques, symbols. Safety precautions in welding.  **Gas Welding** - Principle of operation, Types of gas welding flames and their applications, Gas welding equipment - Gas welding torch, Oxygen cylinder, acetylene cylinder, cutting torch, Blow pipe, Pressure regulators, Filler rods and fluxes and personal safety equipment for welding.  **Arc Welding** - Principle of operation, Arc welding machines and equipment. A.C. and D.C. arc welding, Effect of polarity, current regulation and voltage regulation, Electrodes: Classification,  B.I.S. specification and selection, Flux for arc welding. Requirements of pre heating, post heating of electrodes and work piece. Welding defects and their testing methods. | 2  3  3  2 |
| **Chapter -V- Lathe** | | | |
|  | | Principle of turning, Description and function of various parts of a lathe. Classification and specification of various types of lathe, Drives and transmission, Work holding devices.  **Lathe tools:** Parameters/Nomenclature and applications. Lathe operations - Plain and step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning.  **Cutting parameters –** Speed, feed and depth of cut for various materials and for various operations, machining time. Speed ratio, preferred numbers of speed selection.  **Lathe accessories:-** Centers, dogs, different types of chucks, collets, face plate, angle plate, mandrel, steady rest, follower rest, taper turning attachment, tool post grinder, milling attachment, Quick change device for tools.  Brief description of capstan and turret lathe, comparison of capstan/turret lathe, work holding and tool guiding devices in capstan and turret lathe. | 2  2  2  2  2 |
| **Chapter -VI- Drilling** | | | |
|  | | Principle of drilling. Classification of drilling machines and their description.  Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping.  Speeds and feeds during drilling, impact of these parameters on drilling, machining time. Types of drills and their features, nomenclature of a drill.  Drill holding devices. Types of reamers. | 2  2  2  1 |
| **Chapter -VII- Boring** | | | |
|  | | Principle of boring, Classification of boring machines and their brief description. Specification of boring machines. Boring tools, boring bars and boring heads. Description of jig boring machine. | 2 |
| **Chapter -VIII- Cutting Fluids and Lubricants** | | | |
|  | | Function of cutting fluid, Types of cutting fluids, Difference between cutting fluid and lubricant,  Selection of cutting fluids for different materials and operations, Common methods of lubrication of machine tools,  Certifying Organizations (such as SAE, ASTM) for rating standards of lubricants. | 1  1  1 |