LESSON PLAN

Name of Faculty: Bharat Bhushan

Discipline: Mechanical Engg.

Semester: 4th

Subject: Workshop Technology-I Lesson Plan Duration: 15 Weeks

**Work Load: 3**

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|  | **THEORY** | | |
| **WEEK** | **LECT** | **TOPIC** | **DATE** |
| **1** | 1 | **UNIT I**   1. Hand Tools   Chisels – Types and uses of chisels, wood working chisels, metal working chisels – cold chisel, hard |  |
| **2** | Chisel, stone chisel, masonry chisel. Hammers – Types, Basic design and variations |  |
| **3** | Physics of hammering, Hammer as force multiplier, effect of head’s mass, effect of handle. |  |
| **2** | **4** | Saw – Saw terminology, types of saws, types of saw blades, material used for saw |  |
| **5** | Hacksaw frame and its types. Pliers – Function and types. |  |
| **6** | Wrenches/ Spanners – Common General wrenches/spanners,  Specialized wrenches/spanners, Surface plate, V block, files, Surface Gauge. |  |
| **3** | **7** | 2. Measuring Instruments  Calipers – Types – Inside, outside, divider, Odd leg caliper. |  |
| **8** | Vernier Caliper- Parts, uses, checking error, least count, working principle. |  |
| **9** | Outside micrometer - Introduction, parts, Principle, Least count,  Checking zero error. |  |
| **4** | **10** | REVISION |  |
| **11** | **UNIT II**  3. Cutting Tools and Cutting Materials  Cutting Tools - Various types of single point cutting tools and their uses, |  |
| **12** | Single point cutting tool geometry, tool signature and its effect, |  |
| **5** | **13** | Heat produced during cutting and its effect, Cutting speed, feed  and depth of cut and their effect. |  |
| **14** | Cutting Tool Materials - Properties of cutting tool material, Study of various cutting tool materials viz. |  |

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|  | **15** | High-speed steel, tungsten carbide, cobalt steel cemented carbides, stellite, ceramics and diamond. |  |
| **6** | **16** | REVISION |  |
| **17** | **UNIT III**  4. Welding  Welding Process - Principle of welding, Classification of welding processes, Advantages and limitations of welding. |  |
| **18** | Industrial applications of welding, Welding positions and techniques, symbols.Safety precautions in welding. |  |
| **7** | **19** | 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, |  |
| **20** | Pressure regulators, Filler rods and fluxes and personal safety equipment for welding.Arc Welding - Principle of operation, Arc welding machines and equipment. |  |
| **21** | A.C. and D.C. arc welding, Effect of polarity, current regulation and voltage regulation, |  |
| **8** | **22** | Electrodes: Classification,  B.I.S. specification and selection, Flux for arc welding. |  |
| **23** | Requirements of pre heating, post heating of electrodes and work piece. Welding defects and their testing methods. |  |
| **24** | REVISION |  |
| **9** | **25** | **UNIT IV**  5. Lathe  Principle of turning, Description and function of various parts of a lathe. |  |
| **26** | Classification and specification of various types of lathe, Drives and transmission, Work holding devices. |  |
| **27** | Lathe tools:Parameters/Nomenclature and applications |  |
| **10** | **28** | Lathe operations - Plain and step turning, facing, parting  off, taper turning, eccentric turning, |  |
| **29** | Drilling, reaming, boring, threading and knurling, form turning,  spinning. |  |
| **30** | Cutting parameters – Speed, feed and depth of cut for various materials and for various operations, machining time. Speed ratio, preferred numbers of speed selection. |  |
| **11** | **31** | 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 |  |
| **32** | Brief description of capstan and turret lathe, comparison of capstan/turret lathe, work holding and tool guiding devices in capstan and turret lathe. |  |
| **33** | REVISION |  |
| **12** | **34** | **UNIT V**  6. Drilling Principle of drilling. Classification of drilling machines and their description. |  |
| **35** | Various operation performed on drilling machine – drilling, spot facing, reaming, boring, counter boring |  |
| **36** | Counter sinking,hole milling, tapping. Speeds and feeds during drilling, impact of these parameters on drilling, machining time. |  |
| **13** | **37** | Types of drills and their features, nomenclature of a drill. Drill holding devices. Types of reamers. |  |
| **38** | REVISION |  |
| **39** | 7. Boring  Principle of boring, Classification of boring machines and their brief description. |  |
| **14** | **40** | Specification of boring machines. Boring tools, boring bars and boring heads. Description ofjig boring machine. |  |
| **41** | 8. Cutting Fluids and Lubricants  Function of cutting fluid, Types of cutting fluids, |  |
| **42** | Difference between cutting fluid and lubricant,Selection of cutting fluids for different materials and operations. |  |

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| **15** | **43** | Common methods of lubrication of machine tools, Certifying Organizations (such as SAE, ASTM) for rating standards of lubricants. |  |
| **44** | REVISION |  |
| **45** | REVISION |  |