LESSON PLAN

Name of Faculty: Bharat Bhushan

Discipline: Mechanical Engg.

Semester: 4th

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

**Work Load: 3**

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|  | **THEORY** | | |
| **WEEK** | **LECT** | **TOPIC** | **DATE** |
| **1** | 1 | **UNIT I**  1. Gear Manufacturing  Gear materials and specifications, |  |
| **2** | Gear manufacturing by Casting, Moulding, Stamping, |  |
| **3** | Machining; Gear generating methods: Gear Shaping with pinion cutter & rack cutter; |  |
| **2** | **4** | Gear  hobbing; Description of gear hob; Operation of gear hobbing machine; |  |
| **5** | Gear finishing processes; |  |
| **6** | REVISION |  |
| **3** | **7** | **UNIT II**  2. Grinding  Principles of metal removal by Grinding; |  |
| **8** | Abrasives – Natural & Artificial; Bonds and binding  processes: Vitrified, silicate, shellac, rubber, bakelite; |  |
| **9** | Factors affecting the selection of grind wheels. |  |
| **4** | **10** | Size and shape of wheel, kind of abrasive, grain size, grade and strength of bond. |  |
| **11** | Structure of grain, spacing, kinds of bind material; Standard marking systems: Meaning of letters  & numbers sequence of marking |  |
| **12** | Grades of letters; Truing, dressing, balancing and mounting of  wheel.; |  |
| **5** | **13** | Selection of grinding wheel. Grinding machines classification: Cylindrical, Surface, Tool & Cutter grinding machines |  |
| **14** | Construction details; Principle of centreless grinding; Advantages  & limitations of centreless grinding. |  |

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|  | **15** | REVISION |  |
| **6** | **16** | **UNIT III**  3. Modern Machining Processes  Introduction – comparison with traditional machining; Ultrasonic Machining: principle. |  |
| **17** | Description of equipment, applications; Electric Discharge Machining (EDM): Principle, |  |
| **18** | Description of equipment, Dielectric fluid, tools (electrodes), Process parameters, Output characteristics, applications |  |
| **7** | **19** | Wire cut EDM: Principle, Description of equipment, Controlling  parameters; applications. |  |
| **20** | Abrasive Jet Machining: principle, description of equipment,  application |  |
| **21** | Laser Beam Machining: principle, description of equipment, application; Electro |  |
| **8** | **22** | Chemical Machining: description of equipment, application. |  |
| **23** | REVISION |  |
| **24** | **UNIT IV**  4. Metal Forming Processes  Press Working - Types of presses, type of dies and punches, , |  |
| **9** | **25** | Selection of press die, die material. |  |
| **26** | Press Operations-Shearing, piercing, trimming, punching, notching |  |
| **27** | shaving, gearing,embossing, stamping. |  |
| **10** | **28** | Forging - Open die forging, closed die forging, Press forging, upset forging, swaging, up setters,roll forging, Cold and hot forging. |  |
| **29** | Rolling - Elementary theory of rolling, Types of rolling mills, Thread rolling, roll passes, Rolling defects and remedies. |  |
| **30** | Extrusion and Drawing - Type of extrusion- Hot and Cold, |  |
| **11** | **31** | Direct and indirect. Pipe drawing, tube drawing, wire drawing |  |
| **32** | REVISION |  |
| **33** | **UNIT V**  5. Metal Finishing Processes  Purpose of finishing surfaces. Surface roughness-Definition and units |  |
| **12** | **34** | Honing Process, its applications, Description of hones |  |
| **35** | Brief idea of honing machines. Lapping process, its applications |  |
| **36** | Description of lapping compounds and tools. Brief idea of lapping machines. |  |
| **13** | **37** | Polishing, Buffing, Burnishing and super finishing |  |
| **38** | REVISION |  |
| **39** | 6. Metallic Coating Processes  Metal spraying – Wire process, powder coating process, applications,. |  |
| **14** | **40** | Electroplating: Basic principles, Plating metals, applications; |  |
| **41** | Hot dipping: Galvanizing, Tin coating, Parkerising, |  |
| **42** | Anodizing. Organic coatings: Oil base Paint, Lacquer base, |  |

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| **15** | **43** | Enamels, Bituminous paints, rubber base coating; Finishing specifications |  |
| **44** | REVISION |  |
| **45** | REVISION |  |