**RJLB Govt. Polytechnic, Loharu**

***LECTURE PLAN (SEP.2023 - JAN. 2024)***

**BRANCH:** ME **SEMESTER: 3rd**

**SUBJECT:** WT-I

**NAME OF FACULTY**: ANKIT PANGHAL

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| **S.**  **No.** | **Name of Topic** | | **No. of Lectures** |
| **Chapter -1- Welding** | | | |
| 1 | | **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. | 3 |
| 2 | | **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. | 3 |
| 3 | | **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. | 3 |
| 4 | | **Other Welding Processes:-**  Resistance welding: Principle, advantages, limitations, working and applications of spot welding, seam welding, projection welding and percussion welding, Atomic hydrogen welding, Shielded metal arc welding, submerged arc welding, Welding distortion, welding defects, methods of controlling welding defects and inspection of welded joints. | 4 |
| 5 | | **Modern Welding Methods :-**  Methods, Principle of operation, advantages, disadvantages and applications of, Tungsten inert gas (TIG) welding, Metal inert gas (MIG) welding, Thermit welding, Electro slag welding, Electron beam welding, Ultrasonic welding, Laser beam welding, Robotic welding | 3 |
| **Chapter -2- Foundry Techniques** | | | |
| 6 | | **Pattern Making:-**  Types of pattern, Pattern material, Pattern allowances, Pattern codes as per B.I.S., Introduction to cores, core boxes and core materials, Core making procedure, Core prints, positioning of cores | 2 |
| 7 | | **Moulding and Casting:-**  **Moulding Sand:-**  Properties of moulding sand, their impact and control of properties viz. permeability, refractoriness, adhesiveness, cohesiveness, strength, flow ability, collapsibility, Various types of moulding sand, Testing of moulding sand. Safety precautions in foundry. | 3 |
| 8 | | **Mould Making:-**  Types of moulds, Step involved in making a mould, Molding boxes, hand tools used for mould making, Molding processes: Bench molding, floor molding, pit molding and machine molding, Molding machines squeeze machine, jolt squeeze machine and sand slinger. | 3 |
| 9 | | **Casting Processes:-**  Charging a furnace, melting and pouring both ferrous and non ferrous metals, cleaning of castings, Principle, working and applications of Die casting: hot chamber and cold chamber, Centrifugal casting | 2 |
| 10 | | **Gating and Risering System:-**  Elements of gating system, Pouring basin, sprue, runner, gates, Types of risers, location of risers, Directional solidification | 2 |
| 11 | | **Melting Furnaces:-**  Construction and working of Pit furnace, Cupola furnace, Crucible furnace – tilting type, Electric furnace | 2 |
| 12 | | **Casting Defects:-**  Different types of casting defects, Testing of defects: radiography, magnetic particle inspection and ultrasonic inspection. | 2 |
| **Chapter -3- Metal Forming Processes** | | | |
| 13 | | Press Working - Types of presses, type of dies, selection of press die, die material. Press Operations-Shearing, piercing, trimming, punching, notching, shaving, gearing, embossing, stamping | 3 |
| 14 | | Forging - Open die forging, closed die forging, Press forging, upset forging, swaging, up setters, roll forging, Cold and hot forging | 3 |
| 15 | | Rolling - Elementary theory of rolling, Types of rolling mills, Thread rolling, roll passes, Rolling defects and remedies | 2 |
| 16 | | Extrusion and Drawing - Type of extrusion- Hot and Cold, Direct and indirect. Pipe drawing, tube drawing, wire drawing | 2 |
| **Chapter -4- Plastic Processing** | | | |
| 17 | | Industrial use of plastics, and applications- Advantages and limitations of use of plastics. | 2 |
| 18 | | Injection moulding-principle, working of injection moulding machine | 2 |
| 19 | | Compression moulding-principle, and working of compression moudling machine. | 2 |