

AU/IP/ME-3004 MANUFACTURING PROCESS

Objectives :

To make the students aware of different manufacturing processes like casting, metal forming, metal cutting and gear manufacturing.

Outcomes :

1. Concepts of casting Technology. 2. Mechanical working of metals. 3. Concepts of welding process 4. Concept of forging methods 5. Understanding press working .

Casting : Types of casting process .Molding and Foundry core sands and their properties, gating, runners, risers, solidification, defects and elimination, molding machines, centrifugal casting, dye casting, shell molding; Lost wax molding; continuous casting; cupola description and operation.

Welding: Types of welding ,Gas welding method, flames, gas cutting, Electric arc welding, AC and DC welding machines and their characteristics, flux, electrodes, submerged arc welding, TIG & MIG welding; pressure welding; electric resistance welding spot, seam and butt welding; Thermit chemical welding; brazing and soldering, welding defects & remedies .safety precautions .

Pattern Making: Types of patters, Pattern and pattern making, pattern allowances; pattern design considerations, core, core boxes .

Forging: types of forging operations Theory and application of forging processes description; , drop and horizontal forging machines .

Press working: Description and operation of processes, process of shearing, punching, piercing, blanking, trimming, perfecting, notching, lancing, embossing, coining, bending, forging and drawing; press, tool dies, auxiliary equipment, safety devices, stock feeders, scrap cutters, forces, pressure and power requirements .

Rolling: Types of Rolling operations ,General description of machines and process; rolling of structural section plates and sheets; hot and cold rolling techniques

Metal Machining : Basics of Lathe machines , operations & components ,working principle of Shaper & planner ,Introduction to milling ,grinding and drilling machines .

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

References:

1. Anderson and Tetro; Shop Theory; Mc Graw Hills
2. Kaushish JP; Manufacturing Processes; PHI Learning.
3. Kalpakjian Producting Engineering PEARSON Education
4. Chapman; Workshop Technology
5. Philip F Ostwald ; Manufacturing Process & systems : John Wiley
6. Raghuvanshi; Workshop Technology ; Dhanpat Rai.
7. Hajra Choudhary; Workshop Technology:, Vol I

List of Experiments :

1. Study of tools used for various manufacturing processes , study includes application & live demonstration of hand and machine tools .
2. Hands on Exercise on Pattern Making
3. Performance on Metal Casting of Simple component
4. Performance on Welding of simple work piece (Example Arc and Resistance Welding)
5. Exercise Problems on Welding
6. Exercise problems on Casting
7. Study of forging machine & demonstration of various operations of forging .
8. Study of Hydraulic ,Pneumatic presses & demonstration of piercing, slitting, deep drawing operations on press machine.