

**B.E Semester: V Mechanical Engineering**

**Subject Name: Manufacturing Processes**

**A. Course Objective**

- To develop a problem oriented in depth knowledge of Manufacturing Process.
- To address the underlying concepts, methods and application of different Manufacturing Processes.

**B. Teaching / Examination Scheme**

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
ME503	Manufacturing Process	3	0	2	5	4	3	70	30	20	30	150

**C. Detailed Syllabus**

**1. Importance of manufacturing:**

Economic and technological definition of manufacturing, Classification of manufacturing processes, Selection of Manufacturing process

**2. Metal Joining Processes:**

Principle of welding, soldering, Brazing and adhesive bonding. Classification of welding and allied processes. Gas welding and gas cutting, Principle, Oxyacetylene welding equipment, Oxyhydrogen welding. Flame cutting. Arc welding, Power sources and consumables, Gas welding and cutting, Processes and Equipments. Resistance welding, Principle and Equipments, Spot, Projection and seam welding process, Atomic hydrogen, ultrasonic, Plasma and laser beam welding, Electron beam welding, and special welding processes e.g. TIG, MIG, friction and explosive welding, welding of C.I. and Al, Welding defects. Electrodes and Electrode Coatings, Welding positions.

**3. Forming and Shaping Processes:**

Metal working, Elastic and plastic deformation, Concept of strain hardening, Hot and cold working, Rolling, Principle and operations, Roll pass sequence, Forging, Forging operations, extrusion, Wire and tube drawing processes. Forging: Method of forging, Forging hammers and presses, Principle of forging tool design, Cold working processes- Shearing, Drawing, Squeezing, Blanking, Piercing, deep drawing, Coining and embossing, Metal working defects, cold heading, Riveting, Thread rolling bending and forming operation.

**4. Plastic Technology:**

Introduction, Classification of Plastics, Ingredients of Moulding compounds, General Properties of Plastics, Plastic part manufacturing processes such as compression moulding, Transfer moulding, Injection moulding, Extrusion moulding, Blow moulding, Calendaring, Thermoforming, slush moulding, laminating

**5. Super Finishing Processes:**

Introduction, Grinding, Lapping, Honing, Buffing, Barrel Tumbling, Burnishing, Powder coating, Polishing

#### D. Lesson planning

<u>SR.NO</u>	<u>DATE/WEEK</u>	<u>UNIT NO</u>	<u>%WEIGHTAGE</u>	<u>TOPIC NO</u>
1	1 <sup>ST</sup> , 2 <sup>ND</sup> , 3 <sup>RD</sup>	1	20	1
2	4 <sup>TH</sup> , 5 <sup>TH</sup> , 6 <sup>TH</sup>	2	20	2
3	7 <sup>TH</sup> , 8 <sup>TH</sup> , 9 <sup>TH</sup>	3	20	3
4	10 <sup>TH</sup> , 11 <sup>TH</sup> , 12 <sup>TH</sup>	4	20	4
5	13 <sup>TH</sup> , 14 <sup>TH</sup> , 15 <sup>TH</sup>	5	20	5

#### E. Instructional Method & Pedagogy

1. At the start of course, the course delivery pattern, prerequisite of the subject will be discussed
2. Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
3. Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4. One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
5. Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6. Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
8. Term Work should be as per below:
  - 1 Performance of various flames in oxy acetylene gas welding.
  - 2 To join the given two work pieces as a required type of joint by gas welding process.
  - 3 To join the given two work pieces as a butt joint by TIG welding process.
  - 4 To join the given two work pieces as a butt joint by MIG welding process.
  - 5 Effect of welding parameters on bead characteristic for SAW process.
  - 6 To weld given material by spot welding process.
  - 7 To make rectangular tray from the given sheet metal.
  - 8 Analysis of various parameters in rolling process.
  - 9 An Experiment in Powder Metallurgy- Sintering of Cu.
  - 10 Parameter demonstrates in Plastic Injection Molding Process.
  - 11 Influence of main parameters of forging process.

9. **Practical / Oral:** The candidate shall be examined on the basis of term-work.

#### F. Students Learning Outcomes

- The student can identify different areas of Manufacturing Processes.
- Can find the applications of all the areas in day to day life.

#### G. Recommended Demonstrate Materials

1. Production technology, by R.K. Jain, Khanna publishers.
2. Production Technology by P.C. Sharma S Chand & Co Ltd.
3. Manufacturing Technology Vol-II, By P.N. Rao, Tata McGraw Hill.
4. Manufacturing Engg. And Technology By S. Kalpakajain, PHI/Pearson.
5. Welding technology, by O.P.Khanna, Dhanpat Rai publishers