B.TECH. (MECHANICAL) III SEMESTER
MANUFACTURING TECHNOLOGY (MEC-305)

Course Outcomes

CO1 Analyze and access the use of casting processes in manufacturing and understand the working of various casting processes

CO2 Understand the basics of metal cutting and working of different types of machine tools.

CO3 Explain the conventional and advanced metal forming processes and composite fabrication.

CO4 Analyze and access the importance of welding processes in manufacturing and apply knowledge to select appropriate welding process based on the type of industrial application.

B.TECH. (MECHANICAL) III SEMESTER

MANUFACTURING TECHNOLOGY (MEC-305)

SYLLABUS

Course No.: MEC 305 MANUFACTURING TECHNOLOGY C L T (3 2 1)

UNIT I

Introduction to basic manufacturing processes and engineering materials, Casting terminologies, solidification, expendable mould casting processes, patterns and risers, investment casting and plaster mould castings, die casting, centrifugal casting. Introduction to metal cutting, machining processes and machine tools. Orthogonal machining, Cutting forces, shear plane angle, Ernst Merchant theory, mechanics of metal cutting. Tool life equation. Lathe parts and turning operations, Cutting tool nomenclature, tool materials, tool wear. Various machine tools and operations.

UNIT II

Metal Forming: fundamentals of metal forming, independent and dependent variables, hot working and cold working, warm forming, rolling. Forging and various types of forging, extrusion and various types of extrusion. Introduction to various press work operations, press working dies, shearing load and press selection, spinning, High energy rate forming, explosive forming, Electromagnetic forming and its applications, Fabrication of composites.

UNIT III

Welding: Introduction to welding, types of welding. Welding machines, Shielded Metal Arc Welding (SMAW) process, Gas Metal Arc Welding (GMAW) process, Gas Tungsten Arc Welding (GTAW) process, Shielded Arc welding (SAW) process, Resistance welding, Seam, Spot and Flash butt welding, Ultrasonic welding, Laser beam welding, Automation in welding and various defects.

Text books:	• A. Ghosh and A.K. Malik, Manufacturing Science, Affiliated East Press, New-Delhi.
Reference books:	• Campbell, J.S., Principles of Manufacturing Materials and Processes, McGraw-Hill, New-York, • Rao, P.N., Manufacturing Technology, Volume 2, McGraw-Hill Education, New Delhi. • De Garmo, E.P., Materials and Processes in Manufacturing, Collier Macmillan, New York. • Lindberg, R.A., Processes and Materials of Manufacturing, Allyn and Bacon, Boston, 1 • Serope Kalpakjian and Steven R. Schmid, Manufacturing Engineering and Technology, Prentice Hall, New York.