Gautam Buddha University, Greater Noida

School of Engineering (Mechanical Engineering)

Degree	Course Name	Course Code	Marks:100
Integrated B. Tech. + M. Tech. / M.B.A.	Manufacturing Technology - II	ME 202	SM+MT+ET 25+25+50
Semester	**Credits**	**L-T-P**	**Exam.**
IV	3	3-0-0	3 Hours

Unit - I

Introduction to Manufacturing Technology and Powder Metallurgy: Importance of manufacturing; Economic & technological considerations in manufacturing; Classification of manufacturing processes; Materials & manufacturing processes for common items.

Theory of powder metallurgy; Manufacture of metal powders; Sintering; Secondary operations; Properties of finished parts; Design consideration and applications. **(08 Hours)**

Unit – II

Metal Casting: Introduction: Brief history; Advantages and limitations; Applications; Patterns; Pattern materials; Allowances; Types of pattern; Color code scheme; Sand casting processes: Green and dry sand casting process; types of sand; Molding sand and its properties; Molding sand composition; Cores; Use of cores; Core materials; Types of cores; Core prints; Chaplets.

(07 Hours)

Unit – III

Gating and Risering System: Element of gating systems; Types of gates; Special Molding Processes: Carbon dioxide molding process; Investment casting process; Die casting process; Shell molding process; Full molding process; Vacuum-Sealed casting process. Casting defects; Causes and remedies of defects. **(06 Hours)**

Unit – IV

Metal Forming and Sheet Metal Working: Elastic and plastic deformation; Concept of strain hardening; Hot and cold working processes; Brief description of

Rolling; Forging; Extrusion; Swaging; Wire and tube drawing; Presses for sheet metal working; Part feeding systems; Elements of die; Punch and die clearances; Shearing mechanism in press work; Progressive; Compound and combination dies; Applications of sheet formed products; Processes like blanking; Piercing; Punching; Trimming; etc. Forming processes like bending; Cup drawing; Coining; Embossing; etc. High energy rate forming processes.

(09 Hours)

Unit – V

Non-conventional Machining I: Introduction and need for micro machining (Non-conventional) processes; Classifications of non-conventional processes; Abrasive jet machining; Process parameters; Applications; Advantages and limitations. Water jet and Abrasive water jet Machining; Process parameters; Applications; Advantages and limitations, Ultrasonic machining (USM); Process parameters; Applications; Advantages and limitations. **(08 Hours)**

Unit – VI

Non-conventional Machining II: Electro Chemical Machining; Process parameters; Applications; Advantages and limitations. Electro discharge machining; Process parameters; Applications; Advantages and limitations. Electron beam machining; Process parameters; Applications; Advantages and limitations. Laser beam machining; Process parameters; Applications; Advantages and limitations. **(07 Hours).**

Recommended Books:

1. Fundamentals of Modern Manufacturing: Materials; Processes and Systems; Mikell P. Groover; Publisher Willey.
2. Manufacturing Technology : Metal cutting and machine Tools (Vol. 1 & 2); P. N. Rao; Tata McGraw Hill; New Delhi.
3. Manufacturing Engineering & Technology; Kalpakjian; Pearson Pub.
4. Manufacturing science; Ghosh and Malik; East West Press.
5. Materials and Processes in Manufacturing; E. P. DeGarmo; J. T. Black and R.A. Kohser; Prentice Hall of India.
6. Modern Machining Processes; Pandey and Shan; Tata McGraw Hill Publications.
7. Principles of Metal Cutting; Sen and Bhattacharya; New Central Book.
8. Manufacturing Analysis; Cook; Adisson-Wesley.