

B. Tech. (First Year)
Common to All Engineering Branches
BMEC-003 Manufacturing Process

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Continuous evaluation 40
End semester exam 60
Total marks 100
Credits 2.0

Unit-1:

Introduction: Introduction to Manufacturing Processes and their Classification. Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, First Aid. Engineering Materials: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron. Ceramics, plastics, wood, glass etc.

Unit-2:

Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern Allowances, Risers, Runners, Gates, Moulding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies. Exposure to some of the advanced and latest manufacturing techniques being employed in the industry.

Unit-3:**Metal Working (Sheet Metal Work):**

Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining Advantages and Limitations. Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing. Plant Layout, Objectives of Layout, Types of Plant Layout and their Advantages.

Unit-4:**Introduction to Machine Tools:**

Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, CNC machining, Additive manufacturing. Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear. Mechanics of Chips Formations, Type of Chips , Use of Coolants in machining. Welding: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding, Arc Welding: Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing. Plastic moulding, glass cutting.

Instructions for paper setter:

- a. All Questions are compulsory.
- d. The Question paper is divided in to four sections A, B, C and D.
- e. Section A is compulsory and comprises of 12 questions of one mark each, 3 from each unit. The questions shall be asked in such a manner that there are no direct answers including one word answer, fill in the blanks or multiple choice questions (2.5 minutes each)
- f. Section B comprises of 4 questions of 2 marks each, one from each unit. (6 minutes each)
- g. Section C Comprises of 4 questions of 4 marks each, one from each unit. (10 minutes each). Each question shall have two alternatives, out of which student will be required to attempt one.
- h. Section D Comprises of 4 questions of 6 marks each, one from each unit. (15 minutes each). Each question shall have two alternatives, out of which student will be required to attempt one.

Recommended Books

Hazra & Chaudhary, "Workshop Technology", Vol. I & II Asian Book Comp., New Delhi.
 Lindberg, R.A., "Process and Materials of Manufacture", Prentice Hall of India, New Delhi..
 Campbell, J.S., " Principles of Manufacturing Materials and Processes", McGraw- Hill.
 Amitabha Ghosh & Ashok Kumar Malik , "Manufacturing Science", - East-West Press.