

ME 10 32B ADVANCED FOUNDRY AND WELDING TECHNOLOGY

(with effect from the academic year 2010-2011)

Lectures/week: 4 Hrs.

Credits: 4

Sessional Marks: 20+20

End Examination Marks: 60

UNIT - I

Moulding: Development of metal castings- Materials for moulding- Foundry sand control- Different types of cores- Core making processes- Materials for core making- Moulding and core making machines. Recent developments in cores and mould making- Cold set process- Investment process. Shell moulding- Hot box method, Shaw process. Vacuum moulding- moulding for mass production.

UNIT - II

Melting and Solidification: Furnaces used in foundry for melting ferrous and nonferrous metals- Design of cupola and its charge calculations. Family of cast irons- Production of malleable and S.G. Irons- Methods of alloying and inoculants and their effects on the structure and properties of cast iron.

Principles of Solidification: Nucleation- Crystal growth- Morphology and structure of cast metals and alloys- Pure metals- Single phase alloys and eutectics. Solidification in sand and chill moulds.

UNIT - III

Foundry Mechanization: Layout for ferrous and nonferrous foundries- Description of equipment used for mechanization- Sand conditioners- Conveyors- Cranes- Equipment for handling moulds, Cores and molten metal- Knock out of moulds- Fettling equipment.

UNIT - IV

Special Welding Processes: Forge welding- Resistance welding processes- Spot, Seam, Projection, Flash butt welding- Cold pressure welding- Machine cycle for resistance welding- Parameters in resistance welding- Friction welding, Friction stir welding.

UNIT -V

Welding Design:

Factors influencing weld ability of metals - Welding of carbon steels, Stainless steels and cast iron. Weldability of Cu, Al, and its alloys- Ni and its alloys - Temperature changes in welding and their effects on mechanical properties. Absorption of gases by welds and their effects- Residual stresses and distortion- Heat treatment of welded parts. Design of Gas welding and arc welding processes.

TEXT BOOKS:

1. Foundry Technology : Jain P.L.
2. Welding and Welding Technology : Little

REFERENCES:

1. Foundry Engineering : Agarwal.

2. Foundry Engineering : Taylor F. & Others
3. Welding Technology : Koenisburger
4. Principles of Metal Castings : Heine & Others
5. Welding Technology : Parmar R.S.

