

10 ME 41B FOUNDRY TECHNOLOGY

IV B.Tech I Semester

(with effect from the academic year 2013-2014)

Lectures/week: 4 Hrs.

Lectures/week: 3 Hrs.

Credits: 4

Sessional Marks: 40

End Examination Marks: 60

UNIT-I

Pattern Making – Pattern Materials – Pattern allowances – Pattern design considerations – types of patterns.

Mould Making – Moulding sand – Basic requirements of moulding sand, testing of moulding sand. Moulding – Plaster moulding – Metallic moulding.

Core Making – Core sand – Basic requirements of core sand.

Production of cores – Core blowing machine, core shooting machine, core ramming machine – Types of cores – Core prints and chaplets.

Recent developments in core and mould making – shell Moulding – Cold set process – Investment casting process – Shell process – Vacuum Moulding.

UNIT-II

Furnaces used in Foundry for melting ferrous and non-ferrous metals. Cupola furnace and its charge calculations.

Family of Cast Iron – Effect of alloying elements.

Production of Malleable and S.G. Iron, Effect of Inoculants on the structure of Cast Iron inoculated Cast Iron.

UNIT-III

Principles of solidification – Nucleation – Homogeneous nucleation – Critical radius size – Heterogeneous nucleation.

Solidification of pure metals – alloy where no eutectic occurs, alloys where eutectic occurs – Effect of variables – Thermal characteristics of the mould – sand mould – Chill mould.

Fluidity – Factors affecting fluidity – Fluidity measurement.

UNIT-IV

Gating system – Components of gating system – Design of pouring basin, sprue, runner and gates. Gating Ratio – Pressurized and unpressurized gating system.

Risering – Shape and size of risers – Chvorinov's rule – Caine's method improvement of riser efficiency, padding – Insulation pads and sleeves – Chills – Exothermic Riser compounds, Types of Risers.

UNIT-V

Foundry mechanization – Layout for Ferrous and non-ferrous foundries – description of equipment used for mechanization – sand conditioners – conveyors – Cranes – Equipment for handling moulds, cores and molten metal – solidification, metallurgical defects – Cleaning of castings – removal of dry sand cores, removal of extra parts and cleaning of the casting surface.

Inspection of castings – Destructive and non-destructive testing of castings – A brief outline.

TEXT BOOKS :

1. Foundry Technology : Jain P.L.
2. Casting Technology : Rosenthal

REFERENCES:

1. Foundry Engineering : Aggarwal
2. Principles of Metal Casting : Heine and others
3. Foundry Engineering : Taylor, F and others