

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

PRODUCTION ENGINEERING

Subject Name: **Casting Technology**

Subject Code: **152501**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
3	0	2	5	70	30	50

Sr. No.	Course content
1.	Introduction and types of foundries: Basic steps in the process of metal casting; comparison of casting with metal joining, metal removing and other forming processes
2.	Pattern and Pattern Making: Patterns: Planning, Materials, types and design of Patterns, Placement of a Pattern in a Mould, Pattern Equipments and Pattern Construction, Estimation of Weight of Casting, Pattern allowances, Pattern colors and Storing of Patterns.
3.	Mould and Mould Making: Introduction, Moulding Sand – Types and Properties, sand additives, Sand Testing, Moulding Tools and Equipments- Moulding Machines and Hand Moulding tools, Core and Core Making, Types of Cores and Core Boxes, Core Making Machines, Core Prints, Core Venting and Baking, Core Shifting and Chaplets, Different types of Cores and Moulds, Lifting Force on the Core, Finishing of Core, Moulding Processes- Bench Moulding, Floor Moulding, Pit Moulding, Stack Moulding, Green Sand Moulding, Dry Sand Moulding, Loam Moulding, Cement Bonded Sand Moulds, Core Moulding, Machine Moulding.
4.	Melting and Pouring: Types of Foundry Furnaces- Crucibles, Refractory, Air, Cupola, Electric Arc, Induction. Comparison of Furnaces, Calculation of Cupola Charges, De-gasification, inoculation, Pouring and Feeding of Casting,

5.	Gating Systems: Gating System- types of Gates and Risers, Gating Ratios and chills, Riser location & design in actual casting, Directional Solidification in Casting, Physical Behavior of Metals during Solidification. Design criteria's for preparing casting from blue print drawing.
6.	Finishing Processes: Various Fettling, Finishing and Heat Treatment of Casting.
7.	Advance Casting Processes: Processes, parameters and applications of Investment Casting, Continuous Casting, Centrifugal casting, Carbon dioxide molding, Shell Moulding, Gravity die/ permanent mold casting, pressure die casting, Resin bonded casting , plaster mold casting, Vaccum Casting, Full Mould Casting, Slush Casting, Non metal Molding /Ceramic Molding,
8.	Inspection and Testing of Casting: Defects in Casting, its causes and remedies, Inspection and Destructive and non-destructive Testing of Casting including.
9.	Modernization and Mechanization of Foundry: Need, Areas for Mechanization, Typical Layout, Sand Reclamation Techniques, Material Handling, Pollution Control in Foundry, Application of Computers in Casting Processes, safety aspects.
10.	Economics of Casting: Cost estimation in foundry shop including material cost, labor cost, direct and other expenses, overhead expenses.

Reference Books:

1. A Text Book of Foundry Technology by O.P. Khanna & M. Lal, Dhanpat Rai.
2. Manufacturing Technology Foundry Forming & Welding by P.N. Rao – TMH.
3. Foundry Technology by P.L. Jain.
4. Production Technology by P.C.Sharma – S Chand.
5. Process and Materials of Manufacture By Lindberg – PHI.
6. Casting Technology by Chakravarty – New Age.
7. Metal Casting by Ravi, PHI.
8. Metal Casting by Ramarao- New Age Publication.
9. Principles of Foundry Technology by R.K.Jain.
10. Principle of Metal Casting by Hein.