

# GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

METALLURGY ENGINEERING

Subject Name: **Foundry Technology**

Subject Code: **152103**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Practical (I)
4	0	2	6	70	30	50

Sr. No.	Course content
1.	<b>General:</b> Introduction to metal casting and foundry industry in modern industrial scenario. Advantages and limitations of casting methods. Classification of foundries. Different sections in a foundry and their functions. Important cast metals and alloys-their composition, properties and uses.
2.	<b>Patternmaking:</b> Patterns. Types. Pattern making materials and their selection, Colour code, Pattern allowances, Core-boxes and their types.
3.	<b>Moulding and Core-making Materials:</b> Ingredients of common type of moulding and core-making sands, Their properties and behavior, Testing of sands and clay.
4.	<b>Moulding Processes:</b> Classification. Brief description of processes such as green sand, dry sand, loam, floor, pit and machine moulding. No-bake moulding process. CO <sub>2</sub> -Silicate process.
5.	<b>Casting Processes:</b> Shell moulding and casting process, Investment casting process, Permanent moulding process. Gravity and Pressure Die-casting, Centrifugal casting process. Low Pressure Die-casting (LDPC) process.
6.	<b>Melting:</b> Melting of cast iron, Constructional features of Cupola, Principles and operation of cupola furnace. Advances in cupola melting operation, Melting of aluminium and copper-based alloys. Furnaces used, Melt-treatments such as degassing, Grain-refining and modification.
7.	<b>Gating System:</b> Elements of gating system. Classification. Gating design considerations, Gating ratio. Gating practice for ferrous and non-ferrous alloys, Pouring equipments.

8.	<b>Risering system:</b> Risering practice, Functions of riser, Directional and progressive solidification. Centerline feeding resistance. Riser efficiency. Riser design considerations. Risering curves. Cain's, N.R.L. and Modulus methods, Feeding distance and feeding aids, Blind and atmospheric risers.
9.	<b>Quality Control in Foundry:</b> Casting defects, their causes and remedies. Shop floor quality control tests such as composition control, Wedge test, fluidity, temperature measurement etc.

### Reference Books:

1. Principles of Metal Casting, R. W. Heine, C. R. Loper and P. C. Rosenthal, (Tata McGraw Hill)
2. Principles of Foundry Technology, P. L. Jain, (Tata McGraw Hill).
3. Fundamentals of Metal Casting Technology, P. C. Mukherjee, (Oxford & IBH)
4. Foundry Technology, P. R. Beeley
5. Foundry Engineering, H. F. Taylor, M. C. Flemings, (Wiley Eastern)
6. Foundry Technology, D. Kumar & S. K. Jain, (CBS Pub.)