

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN METALLURGY ENGINEERING

Semester: 4

Subject Name **FOUNDRY TECHNOLOGY**

Sr. No.	Course content
1.	INTRODUCTION 1.1 Advantage of casting over other manufacturing processes. 1.2 List the different section of foundry. 1.3 Different raw materials used in foundry. 1.4 The various ferrous and non ferrous metals and their alloys used in the foundry. 1.5 Different non metallic materials.
2.	PATTERNS 2.1 Pattern materials. 2.2 Types of patterns. 2.3 Colour codes for pattern. 2.4 Assembly of pattern.
3.	MOLD AND CORE MATERIALS 3.1 Types of sand. 3.2 Principal ingredient of moulding sand. 3.3 Properties of moulding sand. 3.4 Types of mould(green sand, dry sand, shell mold,CO2 mold etc.) 3.5 Function of core and core sand. 3.6 Testing and conditioning of moulding sand.
4.	GATING SYSTEM AND RISERING 4.1 Components of gating system. 4.2 Types of gating system. 4.3 Designing of gating system. 4.4 Gating ratio, pressurized and unpressurised gating system. 4.5 Importance and function of riser. 4.6 Open and blind risers. 4.7 Riser shape, size and location.
5.	MELTING 5.1 Melting furnaces. 5.2 Melting of metals and alloys. 5.3 Charging calculations.

6.	SOLIDIFICATION 6.1 Nucleation and growth. 6.2 Cooling curves of metals and alloys. 6.3 Dendritic growth. 6.4 Progressive and directional solidifications. 6.5 Control of solidification. 6.6 Segregation.
7.	SPECIAL CASTING TECHNIQUES 7.1 Advantages of special casting techniques over sand casting method. 7.2 Die casting. 7.3 Centrifugal casting. 7.4 CO ₂ and shell moulding. 7.5 Investment casting.
8.	TESTING AND INSPECTION IN FOUNDRY 8.1 Casting defects (Identification, causes and remedies) 8.2 Inspection of casting (visual, dimensional inspection) 8.3 Non destructive tests. 8.4 Computer applications in foundry. 8.5 Uses and awareness of different codes.

LABORATORY EXPERIENCES:

1. Prepare the layouts of foundry.
2. Measurement of green sand compressive strength by universal sand testing machine as per IS code.
3. Measurement of dry sand compressive strength by universal sand testing machine as per IS code.
4. Measurement of green and dry shear strength by universal sand testing machine as per IS code.
5. Measurement of A.S.T.M. permeability no. of molding sand by molding meter.
6. Measurement of clay content of molding sand.
7. Measurement of moisture content of molding sand by weight loss method and rapid moisture teller as per IS code.
8. Preparation of mold and measure its mold hardness by mold hardness teller.
9. Demonstrate Cupola, its operation and maintenance.
10. To determine grain size and distribution of grain size by Sieve analysis.

Reference Books:

Sr. No.	Name of Books	Author
1.	A text book of foundry technology	by M.Lal
2.	Principal of foundry technology	by P.L.Jain
3.	Foundry engineering	by Tayler, Waiff
4.	Principal of metal casting	by Heine and Rosenthal
5.	Fundamental of metal casting	by P.C.Mukherji
6.	Introduction to foundry technology	by Ekay Winter