FOUNDRY TECHNOLOGY
(Professional Elective – I)

Course Code: 15ME1113

Prerequisite:
Materials Science and Manufacturing Technology - I

Course Outcomes:
At the end of the course, the student will be able to

CO 1 Detect the material to prepare patterns and moulds
CO 2 Explain sand preparation, reclamation, control tests and various types of moulding processes
CO 3 Select melting furnaces and ladles, non-destructive methods used in castings
CO 4 Design gating systems and calculate solidification time.
CO 5 Identify defects, salvage and heat treatment of castings

UNIT-I (10 Lectures)
INTRODUCTION:
Introduction to moulding and casting processes - steps involved advantages, limitations, application of casting process. Patterns - types, applications, pattern allowances-pattern materials, colour coding as per BIS, pattern making, core and core making, core boxes, core prints, core blowers, core shooters.

SAND MOULD MAKING:
Moulding and core sands, ingredients, properties, types of sands, sand selection - machine moulding, types of machines, applications.
UNIT-II (10 Lectures)
CASTING PROCESSES:
Sand preparation and sand reclamation-sand control tests. Sand casting process, types of moulding processes - plaster mould casting, die-casting process - die casting methods. centrifugal casting, continuous casting ,shell moulding ,CO2 moulding-investment casting , full mould process.

UNIT-III (10 Lectures)
MELTING, POURING AND TESTING:

UNIT-IV (10 Lectures)
GATING, FEEDING AND MECHANIZATION:
Elements of gating system, functions, types and design of gating systems, gating ratio, risers - functions, types and designs. Methods to controlling solidification, solidification time calculations and foundry mechanization.

UNIT-V (10 Lectures)
FOUNDRY PRACTICE ON FERROUS AND NON FERROUS METALS:
Production of iron castings - Steel foundry practice - Copper alloy foundry practice - Aluminium alloy foundry practice - Magnesium alloy foundry practice - Zinc alloy foundry practice.

FOUNDRY METALLURGY:
Heat treatment of castings, inspection, testing and quality control in foundries, salvage in defective castings, foundry mechanization.
Foundry environment, health and safety: Dust problems in foundries, preventive maintenance in foundries, returning a sick foundry to profitability.
TEXT BOOKS:

REFERENCES: