DEPARTMENT OF METALLURGICAL and MATERIALS ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	Metal casting Technology		
Course Code	MTPC19	**No. of Credits**	03
Course Code of Pre-requisite subject(s)	NIL		
Session	**August 2023**	**Section (if, applicable)**	NA
Name of Faculty	S P Kumaresh Babu	**Department**	MME
Email	babu@nitt.edu	**Telephone No.**	9487438564
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	**----**	**Telephone No.**	**----**
Course Type	**Core**		

Syllabus (approved in BoS)

Introduction to casting and foundry industry; basic principles of casting processes; sequence in foundry operations; patterns; molding practice; ingredients of molding sand and core sand, sand testing; different molding processes Types of furnaces used in foundry; furnaces for melting; melting practice for steel, cast iron, aluminum alloys, copper alloys and magnesium alloys; safety considerations; fluxing, degassing and inoculation Sand casting, permanent mold casting, die casting, centrifugal casting, plaster mold casting, investment casting, continuous casting, squeeze casting, full mold process, strip casting Overview of pouring and solidification, concept of shrinkage, Chvorinov's rule, chilling; gating systems, functions of riser, types of riser, bottom pouring and top pouring , yield calculations, visualization of mold filling (modeling), methoding Concepts of solidification; directional solidification, role of chilling; filtration of liquid metals; consumables; details of inoculation and modification – with respect to cast irons and Al-Si system; casting defects; soundness of casting and its assessment

COURSE OBJECTIVES

To know the basic concepts of metal casting technology and to apply them to produce of new materials

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Select the appropriate design of the molds, patterns and cores, etc..	1,3,11
2. Choose the appropriate process for required applications and needs	1,8

3. Choose the appropriate furnace for the production of metals and alloys	3,8
4. Distinguish the types of gating and risering systems	1,9
5.To know the defects in the casting with causes and remedies for it	4,5

COURSE PLAN – PART II			
COURSE OVERVIEW			
The course covers the Metal casting Technology principles of with the basic knowledge in patterns,cores ,gating systems ,feeding practices and solidification of metals etc..			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	I-IV	Introduction to casting and foundry industry; basic principles of casting processes; sequence in foundry operations; patterns; molding practice; ingredients of molding sand and core sand, sand testing; different molding processes Construction use and operation of electric arc furnace- core and core less induction, cupola, rotary and crucible furnaces.	Class room lecture with both chalk & talk and power point
2	V-VII	Sand casting, permanent mold casting, die casting, centrifugal casting, plaster mold casting, investment casting, continuous casting, squeeze casting, full mold process, strip casting	
3	VIII-IX	Types of furnaces used in foundry; furnaces for melting; melting practice for steel, cast iron, aluminum alloys, copper alloys and magnesium alloys; safety considerations; fluxing, degassing and inoculation	
4	X-XI	Chvorinov's rule, chilling; gating systems, functions of riser, types of gates, riser efficiency improvement techniques.	
5	XII	Defects in the casting	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration (min)	% Weightage
1	Assessment I	IV	60	20
2	Assessment II	VI	60	20
2	Assignment I	VI	Individual	10
3	Assignment II	VIII	Individual	10
4	Tutorial	VIII	45	Nil
CPA	Compensation Assessment	XI	60	20
5	End semester Examination	XIII	150	40

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

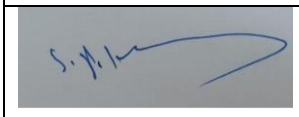
The exit survey will be assessed based on the questionnaire prepared by the class teacher and expected attainment is 75% on 1-10 scale basis

COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)

MODE OF CORRESPONDENCE (email/ phone etc)
Email/Mobile
ATTENDANCE
Minimum 75% excluding ODs. Medical certificate for genuine cases is permitted
COMPENSATION ASSESSMENT
It will be given during IX week for those who are absent on genuine grounds for any one of the cycle tests.
ACADEMIC HONESTY & PLAGIARISM
Plagiarism will be checked for assignments.

ADDITIONAL INFORMATION

The Course faculty is available for consultation at any time. Students can also contact him at any time through phone or by mail. The phone number and mail ID will be given to the students at the beginning of the course



Course Faculty _____ **CC-Chairperson** _____ **HOD** _____
(Dr.S P Kumaresh Babu)