

COURSE PLAN – PART I			
Course Title	Emerging Materials		
Course Code	MTPE23	No. of Credits	3
Department	MME	Faculty	Dr. P. VIVEKANANDHAN
Pre-requisites Course Code	---	Section (if, applicable)	--
Course Coordinator(s) (if, applicable)		Department	MME
Other Course Teacher(s)/Tutor(s) E-mail	--	Telephone No.	9865392902 Intercom : -
Course Type	<input type="checkbox"/> Core course <input checked="" type="checkbox"/> Program Elective course		
Syllabus (approved in BoS)			
<p>Techniques of rapid solidification. production of metallic glasses, atomic arrangement, comparison with crystalline alloys - mechanical, electrical, magnetic, superconducting and chemical properties and applications.</p> <p>Phase diagrams of ferritic, martensitic and austenitic stainless steels, duplex stainless steels, precipitation hardenable stainless steels, mechanical and metallurgical properties of stainless steels, HSLA steels, micro-alloyed steels.</p> <p>Aluminium alloys, magnesium alloys and titanium alloys; metallurgical aspects, mechanical properties and applications.</p> <p>Development of super alloys-iron base, nickel base and cobalt base - properties and their applications; materials for cryogenic service, materials in nuclear field, materials used in space.</p> <p>Carbonaceous materials - including nano tubes and fullerenes; shape memory alloys, functionally gradient materials, high temperature super conductors - bio materials</p>			
COURSE OBJECTIVES			
1. To define new engineering materials and apply for multi-functional areas.			
COURSE OUTCOMES (CO)			
Course Outcomes		Aligned Programme Outcomes (PO)	
At the end of the course student will be able to:			
1. Describe the processing route, mechanical, electrical, magnetic and chemical properties of metallic glasses.		1	
2. Analyse the Phase diagram and Microstructure of different type of stainless steel materials.		1, 2	

3. Demonstrate the metallurgical aspects and applications of aluminium, magnesium and titanium alloys.	1
4. Describe the materials used for cryogenic, nuclear and space applications.	3, 1, 2
5. Understand the effect of structures on the properties of functional materials like carbon nanotubes, fullerenes, shape memory alloy, biomaterials, etc.	3, 1



COURSE PLAN – PART II

COURSE OVERVIEW

Course discuss in detail about the properties, processing and applications of various emerging functional materials.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 st – 3 rd Week Jan 2022	Techniques of rapid solidification. production of metallic glasses, atomic arrangement, comparison with crystalline alloys - mechanical, electrical, magnetic, superconducting and chemical properties and applications.	Chalk and board, Power point (Class room or onlineMode teaching) through Course material
2	4 th Week Jan - 2 nd Week Feb 2022	Phase diagrams of ferritic, martensitic and austenitic stainless steels, duplex stainless steels, precipitation hardenable stainless steels, mechanical and metallurgical properties of stainless steels, HSLA steels, micro-alloyed steels.	Chalk and board, Power point (Class room or onlineMode teaching) through Course material
3	3 rd Week Feb – 1 st Week Mar 2022	Aluminium alloys, magnesium alloys and titanium alloys; metallurgical aspects, mechanical properties and applications.	Chalk and board, Power point (Class room or onlineMode teaching) through Course material
4	2 nd Week - 4 th Week Mar 2022	Development of super alloys-iron base, nickel base and cobalt base - properties and their applications; materials for cryogenic service, materials in nuclear field, materials used in space.	Chalk and board, Power point (Class room or onlineMode teaching) through Course material
5.	1 st Week – 3 rd Week Apr 2022	Carbonaceous materials - including nano tubes and fullerenes; shape memory alloys, functionally gradient materials, high temperature super conductors - bio materials	Chalk and board, Power point (Class room or onlineMode teaching) through Course material

COURSE ASSESSMENT METHODS (shall range from 4 to 6)				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test	3 rd Week of Feb 2022	1 hr 30 min	30
2	Quiz / Seminar	1 st Week of Mar 2022	-	20
3	Assignment / Case Study	2 nd Week of Apr 2022	-	20
CPA	Compensation Assessment	4 th Week of Apr 2022	-	30 / 20
5	End semester exam	2 nd Week of May 2022	2hrs	30
COURSE EXIT SURVEY Student's Feedback				
COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)				
<p>MODE OF CORRESPONDENCE (email/ phone etc) : communication through mobile and E-mail.</p> <p>ATTENDANCE : Minimum attendance 75%. If less than 75% attendance, He /She will be prevented from writing the end semester and re-do the course. Students secured F grade should re-appear the examination as per Institute norms</p> <p>COMPENSATION ASSESSMENT : If any students miss the test in genuine ground (production of certificate or letter from the authorized personnel), She / he will be permitted for compensation assessment</p> <p>ACADEMIC HONESTY & PLAGIARISM : If any students involve in malpractice in test or final examination, She /he will be prevented from writing the final assessment and awarded F grade and re-do the course (as per Instt. Regulations)</p>				
ADDITIONAL INFORMATION				
Nil				
FOR APPROVAL				
				
Course Faculty _____		CC-Chairperson  HOD 