

**DEPARTMENT OF METALLURGICAL AND MATERIALS ENGG.  
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

<b>COURSE PLAN – PART I</b>			
<b>Course Title</b>	EMERGING MATERIALS		
<b>Course Code</b>	MTPE14	<b>No. of Credits</b>	3
<b>Department</b>	MME	<b>Faculty</b>	Dr.M.Murali
<b>Pre-requisites Course Code</b>	---	<b>Section (if, applicable)</b>	--
<b>Course Coordinator(s) (if, applicable)</b>		<b>Department</b>	MME
<b>Other Course Teacher(s)/Tutor(s) E-mail</b>	--	<b>Telephone No.</b>	9965856412
<b>Course Type</b>	<b>Elective course</b>		
<b>Syllabus (approved in BoS)</b>			
Techniques of rapid solidification. production of metallic glasses, atomic arrangement, comparison with crystalline alloys - mechanical, electrical, magnetic, superconducting and chemical properties and applications 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 Aluminium alloys, magnesium alloys and titanium alloys; metallurgical aspects, mechanical properties and applications 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 Carbonaceous materials - including nano tubes and fullerenes; shape memory alloys, functionally gradient materials, high temperature super conductors – biomaterials			
<b>COURSE OVERVIEW</b>			
To define new engineering materials and apply for multi-functional areas			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>	<b>Aligned Programme Outcomes (PO)</b>		
Upon completion of this course, the student will be able to:			
1. Describe various processing techniques of different engineering materials	1, 3,5		
2. Analyze the Phase diagram and Microstructure using Microscope for different type of Stainless steel materials	2, 4, 5, 11		
3. Select the material for Biological, Nuclear, Space and Cryogenic service applications.	1, 4, 10, 3		

**COURSE PLAN – PART II**

**COURSE OVERVIEW**

**COURSE TEACHING AND LEARNING ACTIVITIES**

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	1 <sup>st</sup> to 4 <sup>th</sup> week, Jan, 2020	Techniques of rapid solidification. production of metallic glasses, atomic arrangement, comparison with crystalline alloys - mechanical, electrical, magnetic, superconducting and chemical properties and applications	Power point Presentation, Chalk and Board
2	1 <sup>st</sup> Feb, 2020 to 1 <sup>st</sup> week, Mar 2020	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	Power point Presentation, Chalk and Board
3	1 <sup>st</sup> to 4 <sup>th</sup> week, Mar, 2020	Aluminium alloys, magnesium alloys and titanium alloys; metallurgical aspects, mechanical properties and applications	Power point Presentation, Chalk and Board
4	4 <sup>th</sup> week, Mar to 1 <sup>st</sup> week Apr, 2020	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	Power point Presentation, Chalk and Board
5	2 <sup>nd</sup> to 4 <sup>th</sup> week, Apr 2020	Carbonaceous materials - including nano tubes and fullerenes; shape memory alloys, functionally gradient materials, high temperature super conductors – biomaterials	Power point Presentation, Chalk and Board

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment - I	4th week Feb,2020	1 hr	20
2	Assessment - II	1 <sup>st</sup> week of Apr, 2020	1 hr	20
3	Assignment	----	----	10
4	Compensation Assesment	3 <sup>rd</sup> week of Apr, 2020	1 hr	20
5	Final Assessment	May 2020	3hrs	50

**COURSE EXIT SURVEY**

Student's Feedback

**COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, , academic honesty and plagiarism etc.)****MODE OF CORRESPONDENCE (email/ phone etc) :** communication through class reps through mobile and E-mail.**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**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**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)**ADDITIONAL INFORMATION**

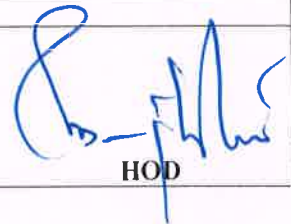
Nil

**FOR APPROVAL**

Course Faculty



CC-Chairperson



HOD

(B. Ransanwal)