

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE			
COURSE TITLE AND CODE	Emerging Materials - MTPE14		
PROGRAMME AND SEMESTER	B.Tech MME - Vth	NO. OF CREDITS	03
DEPARTMENT	MME	FACULTY	Mr. TEJAS R
PRE - REQUISITES COURSE CODE	Nil		
COURSE COORDINATOR(S) (IF APPLICABLE)	-		
OTHER COURSE TEACHER(S)/TUTOR(S) E-MAIL	<u>tejas@nitt.edu</u>	Telephone No.	8608361648
COURSE TYPE	<input checked="" type="checkbox"/> Elective course <input type="checkbox"/> Core course		
COURSE OVERVIEW			
This course will introduce the students to various materials (their production, properties and applications) that form the cutting edge of growth in the industry today.			
COURSE OBJECTIVES			
To define new engineering materials and apply for multi-functional areas.			
COURSE OUTCOMES (CO)			
Course Outcomes		Aligned Programme Outcomes (PO)	
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 TEACHING AND LEARNING ACTIVITIES			
S. No.	Week	Topic	Mode of Delivery
1	Week #1	Techniques of rapid solidification, production of metallic glasses, atomic arrangement.	Lectures using board or PPT
2	Week #2	Comparison with crystalline alloys - mechanical, electrical, magnetic, superconducting and chemical properties and applications.	Lectures using board or PPT
3	Week #3 to #5	Phase diagrams of ferritic, martensitic and austenitic stainless steels, duplex stainless steels, precipitation	Lectures using board or PPT

		hardenable stainless steels, mechanical and metallurgical properties of stainless steels, HSLA steels, micro-alloyed steels	
4	Week #6 to #8	Aluminium alloys, magnesium alloys and titanium alloys; metallurgical aspects, mechanical properties and applications	Lectures using board or PPT
5	Week #7 to #10	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.	Lectures using board or PPT
6	Week #11 to #12	Carbonaceous materials - including nano tubes and fullerenes; shape memory alloys, functionally gradient materials, high temperature superconductors – bio materials	Lectures using board or PPT

COURSE ASSESSMENT METHODS

S. No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment I (Written Test)	7 th Week	45 mins	20%
2	Assessment II (Written Test)	12 th Week	45 mins	20%
3	Assessment III (Re-Test)*	14 th Week	45 mins	20%
4	Assignment I	7 th to 10 th Week	1 week	10%
5	Final Assessment	15 th Week	3 Hrs	50%

*Assessment III will be conducted only for students who missed either of Assessments I or II.

ESSENTIAL READINGS : Textbooks, reference books, website addresses, journals, etc

1. SukhDevSehgal, Lindberg R.A., 'Materials, their Nature, Properties and Fabrication', S Chand, 1973
2. Polmear I. J. 'Light alloys: Metallurgy of Light Metals', 3rd Edition, Arnold, 1995

COURSE EXIT SURVEY

Feedback will be collected anonymously twice during the semester via the class representative.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

ASSESSMENT

- Course related details and exact date-time for the assessments will be intimated to the students at appropriate time via webmail, and through class representatives.
- Students who have missed any of the assessment tests (I or II) will be provided with one retest towards the end of the semester as per table above.
- Students should submit assignments or take seminar in a unique topic from a list provided by the course tutor by the last date (to be announced in class). Plagiarism will be penalized by deducting marks for the student(s) involved.

- The passing mark and the grading will be assigned as per department norms.
- Students who have missed the final assessment due to some genuine reason shall be provided with one chance (a re-assessment) failing to attend or score sufficient marks in which, the student will have to take up formative assessment. Students who have failed in the formative assessment will have to re do the course.

ATTENDANCE

- Students are required to have a minimum of 70% attendance to be eligible to write the final assessment, without which they will have to redo the course.

GENERAL

- Students are expected to use fair means during assessments.
- Students are expected to attend all classes and contribute to discussion in the class room
- Students are advised to regularly check their webmail, and also contact their class representatives for information and updates regarding the course.

ADDITIONAL COURSE INFORMATION

- Students can send any queries to the faculty/tutor at any stage in the course duration via email (tejas@nitt.edu) ONLY. Face to face discussions by appointment (by email) ONLY.

FOR SENATE'S CONSIDERATION

Course Faculty
Mr. Tejas R

CC-Chairperson
Dr. S. Jerome

HOD
Dr. S. P. Kumaresh Babu

Dr. S.P. KUMARESH BABU
HEAD
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