

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE OUTLINE TEMPLATE			
Course Title	Polymers, composites and ceramics ✓		
Course Code	MTPC22 ✓	No. of Credits	3 ✓
Department	MME	Faculty	Dr.V.Surianarayanan ✓
Pre-requisites Course Code	Not required		
Course Coordinator(s) (if applicable)	Not applicable		
Tutor(s) E-mail	suri@nitt.edu	Contact No.	→ 9944954419
Course Type	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
COURSE OVERVIEW			
This course introduces different polymer, composite and ceramic materials and discusses their properties and applications. The microstructural investigation and different process routes to modify them to achieve desired properties would be covered.			
COURSE OBJECTIVES			
To develop the basic knowledge of materials particularly polymers and composites other than conventional metals and alloys to apply them to advance engineering applications.			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes (PO)		
1. Select different materials other than conventional metals and alloys for specific engineering applications	[3,4]		
2. Solve the materials problems associated with the weight reduction through the appropriate choice of polymers ceramics, and composites	[1,11]		
3. Provide low cost alternative to expensive metals and alloys	[8]		
4. Describe the selection criterion for polymers, ceramics and composites for various engineering applications	[1,10,11]		
5. Analyze different microstructure of polymers, ceramics and composites and alter them according to application requirements	[1,11,5]		
6. Emphasis the need of modern materials over conventional metal and alloys	[8]		

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COURSE TEACHING AND LEARNING ACTIVITIES

Sl.No	Week	Topic	Mode of Delivery
1	1 st & 2 nd Week	Introduction - as a material, classification, types of polymerization, mechanisms, statistical approach, catalysts in polymerization, molecular weight determination,	Chalk and Talk
2	3 rd & 4 th Week	methods of molecular weight characterization Plastic compounding of plastics mechanical, thermal, optical, electrical properties with reference to important engineering plastics -	Chalk and Talk
3	5 th Week	LDPE, HDPE, PVC, polyester, phenol formaldehyde, alkyds, cellulose, elastomers	Written Test
4	6 th & 7 th Week	Fabrication technology and polymer processing, moulding practices, extrusion; application of polymers and plastic fibers, elastomers, adhesives, bio-medical applications,	Chalk and Talk
5	8 th & 9 th Week	fiber reinforced plastics, conducting polymers Introduction, classification of composites, micro-mechanics, interphase bond, stress distribution and load transfer, prediction of strength of composites,	Chalk and Talk
6	10 th week	anisotropy and failure criteria; reinforcement materials, whiskers, fibers and resins	Written Test

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7	11 th & 12 th Week	Molten metal infiltration, powder metallurgy methods, hot pressing, hot rolling, co-extrusions; fiber-reinforced metals, eutectic alloys composites, their engineering properties and applications	Chalk and Talk
8	13 th Week	Reassessment (covering the syllabus of both the assessments)	Written Test
9	14 th Week	Final Assessment	Written Test

COURSE ASSESSMENT METHODS

Sl.No	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment 1 (Written test)	5 th Week	1 hour	20 %
2	Assessment 2 (Written test)	10 th Week	1 hour	20 %
3	Reassessment (Written test)	13 th Week	1 hour	20 %
4	Assignments	2 assignments		10 %
5	Final Assessment (Written test)	14 th Week	3 hours	50 %

ESSENTIAL READINGS : Textbooks, reference books etc.,

1. Billmeyer F., 'Textbook of Polymer Science', Wiley Interscience, 1994


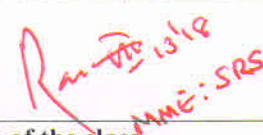

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

The exit survey will be assessed based on the questionnaire prepared by the Institute/class teacher and the expected attainment to be greater 75%. The feedback collected from students by the Institute is to be informed to the teacher to improve the course in future semesters.

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

1. The students are expected to attend all the classes except for medical reasons. Minimum attendance of 75% (including the concession for on-duty and medical reasons) is required for writing the semester examination.

FOR SENATES CONSIDERATION

		
Signature of the Teacher	Signature of the class committee chairman	Signature of the HoD