

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

COURSE PLAN – PART I			
Course Title	Polymers and Composites		
Course Code	MT 654	No. of Credits	03
Course Code of Pre-requisite subject(s)	NIL		
Session	Jan 2023	Section (if, applicable)	NA
Name of Faculty	Dr. Nimu Reger	Department	MME
Email	nimu@nitt.edu	Telephone No.	Mobile: 9784923200 WhatsApp: 9784923200
Name of Course Coordinator(s) (if, applicable)	NA		
E-mail	--- nimu@nitt.edu	Telephone No.	----: 9784923200
Course Type	Core Course		
Syllabus (approved in BoS)			
<p>Introduction - as a material, classification, types of polymerization, mechanisms, statistical approach, catalysts in polymerization, molecular weight determination, methods of molecular weight characterization Plastic compounding of plastics mechanical, thermal, optical, electrical properties with reference to important engineering plastics - LDPE, HDPE, PVC, polyester, phenol formaldehyde, alkyds, cellulose, elastomers Fabrication technology and polymer processing, molding practices, extrusion; application of polymers and plastic fibers, elastomers, adhesives, bio-medical applications, fiber reinforced plastics, conducting polymers</p> <p>Introduction: Definitions, Composites, Reinforcements and matrices, Types of reinforcements, Types of matrices, Types of composites, Carbon Fibre composites, Properties of composites in comparison with standard materials, Applications of metal, ceramic and polymer matrix composites.</p> <p>Manufacturing methods: Hand and spray lay - up, injection molding, resin injection, filament winding, pultrusion, centrifugal casting and prepregs. Fibre/Matrix Interface, mechanical. Measurement of interface strength. Characterization of systems; carbon fibre/epoxy, glass fibre/polyester, etc.</p>			
COURSE OBJECTIVES			
To understand the what are polymers and composites as engineering materials, their structure property correlation, types of the polymers and composites and to apply them for the destructive and nondestructive testing of various structural engineering applications.			
COURSE OUTCOMES (CO)			
Course Outcomes			
<ul style="list-style-type: none"> • Introduction - as a material, classification, types of polymerization, mechanisms, statistical approach, catalysts in polymerization, molecular weight determination, 		1	
<ul style="list-style-type: none"> • methods of molecular weight characterization Plastic compounding of plastics mechanical, thermal, optical, electrical properties with reference to importan engineering 		3,2	

plastics - LDPE, HDPE, PVC, polyester, phenol formaldehyde, alkyds, cellulose, elastomers	
<ul style="list-style-type: none"> Fabrication technology and polymer processing, molding practices, extrusion; application of polymers and plastic fibers, elastomers, adhesives, bio-medical applications, fiber reinforced plastics, conducting polymers 	1
<ul style="list-style-type: none"> Definitions, Composites, Reinforcements and matrices, Types of reinforcements, Types of matrices, Types of composites, Carbon Fibre composites, Properties and Applications of metal, ceramic and polymer matrix composites 	5,9,2
<ul style="list-style-type: none"> Manufacturing methods: Hand and spray lay - up, injection molding, resin injection, filament winding, pultrusion, centrifugal casting and prepregs. Fibre/Matrix Interface, mechanical. Measurement of interface strength. Characterization of systems; carbon fibre/epoxy, glass fibre/polyester, etc. 	4

COURSE PLAN – PART II

COURSE OVERVIEW

The course covers theoretical aspects of common mineral processing methods and the associated equipment used in mining and pre-extraction practices.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I-III	Introduction, types of polymerization, mechanisms, statistical approach, catalysts in polymerization, molecular weight determination,,	Offline board/ppt mode
2	IV-VI	LDPE, HDPE, PVC, polyester, phenol formaldehyde, alkyds, cellulose, elastomers	
3	VII-IX	Fabrication technology and various applications, fiber reinforced plastics, conducting polymers	
4	X	Composites, Reinforcements and matrices, Types of reinforcements, Types of matrices, Types of composites	
5	XI-XII	Manufacturing methods: Hand and spray lay - up, injection molding, resin injection, filament winding, pultrusion etc	

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration (min)	% Weightage
1	Mid Sem	VI-VII	120	30
2	Quiz 1	XI	20	20

3	Technical Presentations Group	I-XII	50 per group	20
CPA	Compensation Assessment	XII	60	20
4	End semester Examination	XIII	120	30

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/Whatsapp -9784923200

ATTENDANCE

- 75% attendance is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance are prevented from writing the final assessment and shall be awarded 'V' grade.

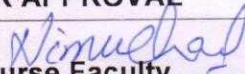
COMPENSATION ASSESSMENT

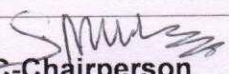
It will be given during XII week for those who are absent on genuine grounds for any one of the Cycle Tests.

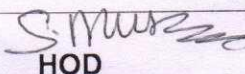
ADDITIONAL INFORMATION

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

FOR APPROVAL


Course Faculty
(Dr. Nimu Chand Reger)


CC-Chairperson
(Prof. Siva Prasad)


HOD
(Prof. S. Muthukumaran)

S. Muthukumaran