

GUJARAT TECHNOLOGICAL UNIVERSITY



Program Name: Engineering

Level: PG

Branch: Plastic Engineering

Course/Subject Code: ME01084011

Course/Subject Name: Plastic Materials

w.e.f. Academic Year:	2024-25
Semester:	1 st Semester
Category of the Course:	PCC

Course Outcome:

After Completion of the Course Student will able to:

No	Course Outcomes
01	Identify and write the structure of Thermoplastic materials.
02	Explain the manufacturing process of Thermoplastic materials.
03	Identify the properties of different thermoplastic materials and apply this knowledge in analyzing their appropriate applications.
04	Explain the manufacturing process of Thermoset materials and identify their properties and applications

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/ Practical		
				ESE (E)	PA/ CA (M)	PA/CA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No.of Hours	%of Weightage
1.	Introduction to Monomers, Oligomers, Polymers, Classification of Polymers	3	5
2.	Commodity Plastics: - Manufacturing of Polyethylene (HDPE,LDPE,LLDPE)- Polypropylene - Polyvinyl Chloride - Polystyrene - Poly Methyl Metharylate Structure, Properties and applications of :LDPE, HDPE,LLDPE,PP, PS, PMMA,	13	30



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	PVC,EVA,EVOH, PAN		
3.	Engineering Plastics: Manufacturing of Nylon 66, Polycarbonate Polyacetal, PET, PBT Structure, Properties and applications of: ABS,HIPS, Nylons, Polycarbonates, Polyacetal, PET,PBT, Polyurethane	10	25
4.	High Performance Plastics: Structure, Properties and applications of Fluoro polymers (PVF, PVDF, PTFE, PCTFE) Polyphenylene oxide Polyphenylene Sulphide, Polysulphones, Polyether ether ketone, Polyimide, Liquid Crystal Polymers	10	25
5.	Thermosetting Plastics: Manufacturing, Properties and applications of : Phenol Formaldehyde ,Urea Formaldehyde , Melamine Formaldehyde , Unsaturated Polyesters , Epoxy resins , Silicones	9	15
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	15	20	10	5	5

Where R:Remember; U:Understanding; A:Application, N:Analyze and E:Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

Books:

- 1) Plastic Materials by J.A. Brydson
- 2) Plastics: Materials and Processing by A. Brent Strong
- 3) Shreve's Chemical Process Industries by George Austin
- 4) Plastics Materials & Processes by Sidney H. Goodman

(b) Open source software and website:

- 1) <https://nptel.ac.in/>
- 2) <https://pslc.ws/>
