SEMESTER S4

PLASTICS MATERIALS

Course Code	PCPOT403	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:1:0:0	ESE Marks	60
Credits	4	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	None	Course Type	Theory

Course Objectives:

1. To make the students aware of types of plastic materials and its properties
2. To make the students capable to estimate the difference in thermal and physical behaviour of plastic materials.
3. To understand the processing behaviour of plastics.
4. To understand the applications of plastics.

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	**Brief history of plastics: -** Advantages and disadvantages - thermoplastics and thermosets. Monomer preparation, polymerisation, properties and application of LDPE, HDPE, cross linked and chlorinated PE and PP, PVC, polyvinylidene chloride	11
2	**Monomer preparation, polymerisation, properties and application** of PVA, polyvinyl acetate, PMMA, PET PAN, PC, nylon-5,6,6-6,6-12, aromatic polyamide and polyacrylamide, regenerated cellulose, and epoxies	11
3	**Monomer preparation, polymerisation, properties and application** of PU, PTFE, polyvinyl fluoride, polyvinylidene fluoride, PS, HIPS, ABS, SAN, and polyacetal. Thermoplastic polyesters, unsaturated polyester laminating resins, polyester moulding compositions, fibre and film forming polyesters.	11

4	**Monomer preparation, polymerisation, properties and application** of PF, preparation of phenol formaldehyde moulding powders, PF laminates. novolac, resol, MF and UF resins	**11**

Course Assessment Method

(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination-2 (Written)	Total
5	**15**	**10**	**10**	**40**

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End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 sub divisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Explain the importance of plastic materials.	**K2**
CO2	Determine the structure, monomer synthesis and properties of chlorine containing and acrylics polymers.	**K5**
CO3	Evaluate the manufacturing processes and application of fluorine containing and styrene polymers	**K5**
CO4	Compare and contrast aliphatic and aromatic amide.	**K4**
CO5	Discuss the manufacturing processes, properties and applications of thermosets	**K6**

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Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3				2	1				
CO2	3	2	3				1	1				
CO3	3	2	3				1	1				
CO4	3	2	3				1	1				
CO5	3	2	3				2	1				

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Introduction to plastics engineering.	Shrivastava, Anshuman	William Andrew	2018
2	Plastics materials.	Brydson, John Andrew.	Elsevier	1999

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Applied plastics engineering handbook: processing and materials.	Kutz, Myer, ed.	William Andrew	2011
2	Introduction to plastics engineering.	Stokes, Vijay K.	John Wiley & Sons	2020

Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1-4	Introduction - Polymers: Concepts, Properties, Uses, Sustainability - YouTube

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