GUJARAT TECHNOLOGICAL UNIVERSITY

PLASTIC TECHNOLOGY (23)
PLASTIC PRODUCT DESIGN
SUBJECT CODE: 2182308
B.E. 8TH SEMESTER

Type of course: CORE

Prerequisite: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		PA (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction to product design, steps for product design, factors to be considered while designing the product	**03**	10%
2	Product design checklist-Preliminary design considerations-General design considerations like wall thickness, undercuts, ribs and bosses, fillets and radii, holes ,taper or draft, inserts, external and internal threads, parting lines, molded lettering, surface treatment.	**15**	25%
3	Relation of process selection with product design- various plastic processing methods –its advantages and disadvantages- comparison of plastic processing methods with respect to product shape, quantity, size, cost and quality- optimization of the material- part design in relation to plastic processing techniques like compression molding, transfer molding, pultrusion, rotational molding,	**11**	20%
4	Selection of plastic materials used for making product – Different plastic materials used for making a product- short term and long term properties and plastic materials- comparison of various plastic materials – optimization of material.	**11**	20%
5	Design process for plastic products like pipes, hinged products, pump impellers, chemical reactors, insulated wires for electrical applications, overhead water storage tank, gears, contact lens, disposable cups, tooth brush, gasket and seals, transparent and optical products, chair.	12	25%

Suggested Specification table with Marks (Theory):

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

Legends: R : Remembrance ; U = Understanding; A = Application and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table

Reference Books:

1. Plastic Materials & Processes by S.S.Schwartz and S.H.Goodman
2. Plastics Design handbook by Dominick V. Rosato, Donald V. Rosato and Marlene G. Rosato.
3. Plastics Products Design Handbook by Edward Miller.
4. Plastics Product Design Engg. Handbook by Levy & Dubois.

Course Outcome:
After learning the course the students should be able to:

List of Experiments:

1. Study the Steps in a product design
2. Study the factors affecting a product design.
3. Study product design considerations related to wall thickness and undercuts.
4. Study product design considerations related to holes, ribs and bosses.
5. Study various plastic processing methods with respect to product design.
6. Tabulate properties of various plastic materials.
7. Case study for designing plastic products.

Major Equipment: List of Open Source Software/learning website:

1. **www.wikipedia.org**
2. **www.sciencedirect.com**
3. **www.mit.edu**

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should be submitted to GTU.