



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Plastic Engineering

Subject Code: ME02084111

Subject Name: Plastic Mould and Product Design

w.e.f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisite:	Plastic Processing : Blow moulding; Extrusion processes
Rationale:	Nil

Course Outcome:

After Completion of the Course Student will able to:

No	Course Outcomes
01	Design and build Injection, extrusion and stretch blow moulds
02	Design crosshead dies
03	Design and build straight thru dies
04	Guide the manufacture of Blow Moulds and Extrusion Dies

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.	Blow Moulds: <ul style="list-style-type: none">• Various types of Blow moulds like Injection , Extrusion and Stretch• Applications of each• Design calculations of Extrusion blow moulds: tolerances, radii, etc.• Design calculations of Injection blow moulds• Design calculations of stretch blow moulds• Rheological studies of extrusion, injection and stretch blow	20	25



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	moulding processes • Use of Rheological findings in design of moulds		
2.	Manufacture of Blow Moulds: Conventional toolroom machines like Lathe, shaping, grinding, etc. CNC machines and their role in blow mould manufacture	10	10
3.	Design of Extrusion Dies • Basic considerations and general rules useful in Die Design • Balancing the Die by adjusting land length • Balancing by Channel Height • Other balancing methods • Importance of power law index	10	20
4.	FILM and SHEET Dies : Flow adjustment; flow channel geometry in sheet dies; Calculations for horseshoe dies;	5	15
5	Design of Pipe and Tube Dies with calculations; Design of Crosshead dies.; Definitions of various draw ratios; Land length, Taper angles; Design of Spiral Mandrel Dies; The Spiral Mandrel Geometry; Effect of Die Geometry on flow Distribution	10	20
6	Coextrusion Dies : Design, flow characteristics	3	10
TOTAL		58	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. Polymer Extrusion by Rauwendaal
2. Plastic Extrusion by Hensen
3. Blow Moulding Handbook by Lee, Hanser Publishers



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)Open source software and website:

1) <https://nptel.ac.in/>

2) <https://www.bpf.co.uk/>

Suggested Course Practical List: : As per the above syllabus topics

List of Laboratory/Learning Resources Required:

Suggested Project List:

Suggested Activities for Students :
