



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Plastics Engineering

Subject Code: BE03053031

Subject Name: Introduction to Moulds & Dies

w. e. f. Academic Year:	2024-25
Semester:	3
Category of the Course:	PCC

Course Outcome:

After Completion of the Course, Student will be able to:

No	Course Outcomes
01	Identify and Understand Different Types of Plastics and Their Processing Techniques.
02	Understand the Principles of Injection Moulding.
03	Gain Insight into Other Moulding Processes.
04	Learn About Mould Design, Runner and Gate Systems, and Ejection Techniques.

Teaching and Examination Scheme:

Teaching - Learning Scheme (in Hours per Semester)					Total Credits = TH/30	Assessment Pattern and Marks					Total Marks
L	T	P	PBL*	TH		Theory		Tutorial / Practical			
						ESE (E)	PA (M)	PA/ (I)	PBL (I)	ESE (V)	
45	0	30	45	120	04	70	30	20	30	50	200

Where L = Lecture, T= Tutorial, P= Practical, TW/SL = Term-Work / Self-Learning, TH = Total Hours, ESE = End-Semester Examination, PA = Progressive Assessment

* Problem Based Learning (PBL) aims to accommodate learning beyond syllabus as per clause 9.4 of NBA manual.

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Introduction to Moulds, Dies and Plastics <ul style="list-style-type: none">Definition and Types of Moulds & Dies (e.g., Injection Moulds, Compression Moulds, Die Casting Dies)Introduction to Plastics in Moulding: Properties and ApplicationsMaterials Used for Moulds and Dies (e.g., Steel, Aluminium), Role of Plastics in Modern Manufacturing (Automotive, Consumer Goods, Medical Devices)	03	10%



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2.	Injection Moulding Process <ul style="list-style-type: none">Principle of Injection Moulding: Material Injection into Mould Cavities	12	20%
	<ul style="list-style-type: none">Applications of Injection Moulding: Types of Products Manufactured (e.g., Containers, Parts)Temperature Range and Material Considerations for Injection Moulding.		
3.	Mould Design Elements <ul style="list-style-type: none">Mould Terminology: Core, Cavity, Feed System, Ejection SystemTypes of Gates: Direct, Submarine, Edge, Pinpoint GatesParting Surface, Venting, and Shrinkage Considerations in Mould Design.	08	15%
5.	Ejection System and Moulding Cycle Optimization <ul style="list-style-type: none">Types of Ejection Systems: Mechanical, Pneumatic, HydraulicShrinkage Factors and Calculation of Shrinkage in Moulded Parts	08	15%
6.	Testing of Plastics and Moulded Parts <ul style="list-style-type: none">Visual, Smoke, and Carbon Black Tests for Quality ControlMelt Flow Index (MFI) Test: Measuring Material Flow Characteristics.	04	13%
7.	Introduction of Extrusion Dies : <ul style="list-style-type: none">Parts of the Die, its functions, design formulae for design of approach section, land, etc. Rheological considerations.	02	12%
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	25	15	15	15

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

References/Suggested Learning Resources:

- (a) **Books:** 1. Injection mould design fundamentals by Denton and Glanvill 2. Extrusion Dies Walter Michael 3. Fundamentals of plastics mould design by Sanjay K. Nayak-Tata McGraw Hill



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(b) Open source software and website:

Suggested Course Practical List: If any

Practical based on above topics.

List of Laboratory/Learning Resources Required:

- **List of suggested activities for Problem Based Learning:**

S.N.	Self Learning Activity
1	MOOCS courses
2	College Library
3	Digital Library
4	National Digital Library of India
5	Society of Plastic Engineering (SPE) Digital Library
6	One Nation One Subscription (ONOS) for Journal Papers

- All records pertaining to the evaluation and assessment of self-learning activities must be properly maintained and preserved at the institute level. These records should be made available to the university upon request.
- Institutes are encouraged to utilize digital platforms, such as Microsoft Teams, for effective record-keeping and to ensure transparency in the evaluation and assessment of self-learning activities.

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