



# GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Plastics Engineering

Subject Code: ME02084061

Subject Name: Plastic Mould and Product Design

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

<b>Prerequisite:</b>	Plastic Processing Technology 1 and 2
<b>Rationale:</b>	Nil

## Course Outcome:

After Completion of the Course Student will able to:

No	Course Outcomes
01	Understand the concept and principal of the plastic mould and product design.
02	Describe the selection of a machine and its specification.
03	Explain the importance of the parting line/parting surface and its selection and explain the need of ejection systems, types of ejection systems and calculation of ejection force required
04	Design Plastic Products

## 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



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## Course Content:

Unit No.	Content	No.of Hours	%of Weightage
1.	Introduction of Injection Mould, Two-Plate Mould: Introduction of Two Plate Injection Mould ,Constructional Details of Two Plate Mould, Three-Plate Mould: Introduction ,Construction and Working : Stripper Plate Mould, Double Daylight Underfeed Mould, Double Daylight Underfeed-Stripper Plate Mould ,Runner Ejection Techniques, Comparison with Two Plate Mould, Mould cooling: Core and Cavity cooling, Design of Cooling Systems; Ejection Systems and applications	12	25
2.	Types of Moulds: Split moulds, Undercut moulds, Unscrewing moulds, and design of each of these with calculations	10	25
3.	COMPRESSION & TRANSFER MOULD DESIGN Types of compression mould-open flash-semi-positive type-positive-displacement moulds types of loading chambers-bulk factor-flash thickness-pot design-depth of loading chamber calculation - projected area -compression pressure -clamping force- deciding no of impression by technological method- heating system-types of heaters - heat losses - heat requirement & heater capacity- advantages and disadvantage so f compression mould. Types of transfer moulds-integral pot transfer mould-Top&Bottom plunger design auxiliary ram transfer mould-transfer pot design-projected area	10	20
4.	PLASTICS PRODUCT DESIGN: Concepts-size, shape and function-form and function-Aesthetics, Ergonomics - Shrinkage, Flashlines. Undercuts-External & Internal-Wall thickness-variances in wall thickness - suggested wall thickness for thermoplastics and thermosetting materials- steps in product design-emphasize on designing with engineering plastics- Taper or draft - Fits & Tolerances - Designing with plastics for load bearing applications like gears, bearing ,etc. Design of radii, fillets, ribs and bosses- Design for flow and shape-Moulded Holes- through holes-blind holes- threaded holes- side holes-holes parallel to draw- nearness of holes to each other and sidewall- moulding holes not parallel to draw- drilled and tapped holes- moulded threads- moulded lettering- surfacetreatment.	16	30
<b>Total</b>		<b>45</b>	<b>100</b>



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## 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. R.G.W. PYE, Injection Mould Design for Thermoplastic, Affiliater East West Press P.Ltd., New Delhi, 1989.
2. Fischer (EG), Blowmoulding of plastics, Newnus Butter Worths, London, 1976.
3. MV Soshi, Dies for Plastics Extrusion, S.G. Wasant for Macmillan India Ltd., Madras, 1992.
4. DYM, Injection Mould Design, Van Nostrand Reinhold Company, New York, 1987.
5. Neil L. Hancox, Design Data for Reinforced Plastics, Chapman & Hall, London, 1994.
6. Beck, Plastic Product Design, Van Nostrand Reinhold Company, London, 1970.
7. Norman Lee, Blow Mould Design, Hanser Publishers, Munich, 1998.

## 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

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