



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Plastics Engineering

Subject Code: DI04023041

Subject Name: Mould Fabrication Technology-II

w. e. f. Academic Year:	2025-26
Semester:	4 th
Category of the Course:	PCC

Prerequisite:	NA
Rationale:	<p>A plastic diploma engineer has to use various metals, metal alloys and machine tools for various mould components. This will requires knowledge of basic & advance fabrication techniques. Advance fabrication techniques used for highly accuracy as well as for mass productions of components with high speed. A Plastic diploma engineer must be aware with modern fabrication techniques to cope up with recent fabrication requirements. This course may help to understand different advanced fabrication techniques. Hence the course has been designed to develop this competency and its associated cognitive, practical and affective domain learning outcomes. This is an important course for plastic engineers.</p>

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Identify need & importance of advance fabrication techniques.	R,U
02	Select suitable EDM & electroforming for given component.	R,U,A
03	Work on pantograph, jig boring & cold hobbing machine.	R,U,A
04	Select suitable polishing & rapid prototyping method.	R,U,A
05	Fabricate mold part using CNC machines.	R,U,A

**Revised Bloom's Taxonomy (RBT)*



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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(M)	PA(I)	ESE(V)	
2	0	2	3	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
Unit – I Introduction to Advance Fabrication	1. Introduction 1.1 Introduction To Conventional Fabrication tool- lathe, shaping, drilling, milling etc. 1.2 Advancements In Fabrication Techniques 1.3 Advantages Of Advance Fabrication Techniques	02	06 % (04 Marks)
Unit – II Electrical Discharge Machining & Electroforming	2.1 Spark Erosion Process 2.1.1 Working Principle 2.1.2 Construction & Working 2.1.3 Dielectric Medium 2.1.4 Different Tool Materials 2.1.5 Advantages And Disadvantages 2.2 Wire-Cut EDM 2.2.1 Working Principle 2.2.2 Construction & Working 2.2.3 Advantages And Disadvantages 2.3 Electroforming Process 2.3.1 Basic Working Principle 2.3.2 Construction & Working 2.3.3 Advantages And Disadvantages	10	26 % (18 Marks)
Unit – III Miscellaneous Processes/ machines	3.1 Pantograph Die Sinking 3.1.1 Basic Working Principle 3.1.2 Construction & Working 3.1.3 Advantages And Disadvantages 3.2 Jig Boring Machine 3.2.1 Basic Working Principle 3.2.2 Construction & Working	08	29 % (20 Marks)



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	<p>3.2.3 Comparison With Vertical Milling Machine</p> <p>3.3 Cold Hobbing</p> <p>3.3.1 Characteristics Of Mould Materials</p> <p>3.3.2 Types Of Hob Materials</p> <p>3.3.3 Process</p> <p>3.3.4 Advantages And Disadvantages</p>		
<p>Unit – IV</p> <p>Polishing &</p> <p>Rapid</p> <p>Prototyping</p>	<p>4.1 Polishing</p> <p>4.1.1 Need And Significance Of Polishing</p> <p>4.1.2 Types Of Polishing Materials</p> <p>4.1.3 Types Of Polishing Methods</p> <p style="margin-left: 20px;">i. Lapping</p> <p style="margin-left: 20px;">ii. Buffing</p> <p style="margin-left: 20px;">iii. Tumbling</p> <p style="margin-left: 20px;">iv. Honing</p> <p>4.2 Rapid Prototyping</p> <p>4.2.1 Need And Significance</p> <p>4.2.2 Types Of Processes And Applications</p> <p style="margin-left: 20px;">i. Stereo Lithography</p> <p style="margin-left: 20px;">ii. Selective Laser Sintering</p> <p style="margin-left: 20px;">iii. Fused Deposition Method</p> <p style="margin-left: 20px;">iv. Laminated Object Manufacturing</p> <p style="margin-left: 20px;">v. 3D Printing</p>	07	23 % (16 Marks)
<p>Unit – V</p> <p>Fundamentals</p> <p>of CNC</p> <p>machines</p>	<p>5.0 Fundamentals Of CNC Machines</p> <p>5.1 Basics of NC & CNC machines</p> <p>5.2 CAM – Concept And Definition.</p> <p>5.3 Components Of CNC Machines</p> <p>5.4 Advantages Over Conventional Machines</p>	03	17 % (12 Marks)
	Total	30	100 % (70 Marks)

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
30	45	25	-----	-----	-----

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



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References/Suggested Learning Resources:

(a) Books:

Sr. No.	Title of Book	Author	Publication with place, year and ISBN
1	Elements Of Manufacturing Processes	B. S. Nagendra Parashar, R. K. Mittal	Publisher: PHI Learning Published year: 2004 ISBN:9788120319585, 8120319583
2	Elements of Workshop Technology (Volume I,II and III)	Choudhary Hajra S.K and Choudhary Hajra A.K.	Publisher: Media Promoters & Pub Pvt Ltd, Mumbai Published year: 2014 ISBN: 5551234002069
3	Modern Machining Technology	Bijoy Bhattacharyya, Biswanath Doloj	Publisher: Elsevier Science Published year: 2019 ISBN:9780128128954, 012812895X
4	Non-Traditional and Advanced Machining Technologies	Helmi Youssef, Hassan El-Hofy	Publisher: CRC Press Published year:2020 ISBN:9781000097146, 1000097145
5	A Textbook of Manufacturing Technology: Manufacturing Processes	R. K. Rajput	Publisher: Laxmi Publications Published year: 2007 ISBN: 9788131802441, 8131802442
6	CNC Fundamentals and Programming	P. M. Agrawal And V. J. Patel	Publisher: Charotar Publishing House Pvt. Limited Published year:2009 ISBN:9788185594989, 8185594988

(b) Open-source software and website:

1. https://www.reliableedm.com/Complete%20EDM%20Handbook/Complete%20EDM%20Handbook_1.pdf
2. https://reliableedm.com/Complete%20EDM%20Handbook/Complete%20EDM%20Handbook_2.pdf
3. <http://www.ignou.ac.in/upload/Unit-3.pdf>



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4. https://www.cet.edu.in/noticefiles/258_Lecture%20Notes%20on%20RP-ilovepdf-compressed.pdf
5. <http://acl.digimat.in/nptel/courses/video/112107078/lec38.pdf>
6. <https://www.youtube.com/watch?v=aWQsEX1TrSI>
7. <https://www.youtube.com/watch?v=kyeDtbmCSgw&t=5s>
8. <https://www.youtube.com/watch?v=Az-EI3QHSIE>
9. <https://www.youtube.com/watch?v=TyZL90po6bg>
10. <https://www.youtube.com/watch?v=nAQ6QfpgZWM>

Suggested Practical List:

Sr. No.	Practical/Exercise (Course Outcomes in Psychomotor Domain according to NBA Terminology)	Approx. Hrs Required
1	Prepare core or cavity for hand injection mold by using conventional machinery.	2
2	Operate a Spark erosion machine.	4
3	Prepare mold insert/ bolster by using wire cut EDM process.	4
4	Prepare cavity by using Electroforming process.	2
5	Identify the parts of Pantograph die sinking machine	2
6	Operate a Jig boring machine and create required dimension hole in given object.	4
7	Demonstrate a Cold hobbing machine.	2
8	Use appropriate method for polishing given object.	2
9	Operate any one rapid prototyping machine and make desire product.	4
10	Operate a CNC machine for manufacturing of given mold part.	4

Suggested Activities for Students:

1. Students will prepare chart for applications of various advance fabrication methods.
2. Students will prepare mold components by various methods.
3. Students will make neat sketches of advance machinery.
4. Students make list of specification for machinery available in laboratory

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