GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering
Subject Code: 3732406
Semester – III
Subject Name: Plastics Mould Manufacturing Technology

Type of course: Program Elective V

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	**Material for Moulds:** Selection of steels – Properties of steels – common steels used for moulds – strength of materials, calculation of wall thickness for cavity – Insert size – Life of mould Non-ferrous metals for mould construction: Application – Zinc base alloys – Aluminium alloys – Beryllium copper Non-metallic materials for mould construction: Advantages and its applications – epoxies - polyester – silicon	10
2	**Surface Treatment of Mould Materials:** Introduction – Heat treatment process – case hardening – through hardening – nitriding – tips on successful heat treatment – vacuum hardening – cryogenic heat treatment – Hard chrome plating – Nickel plating – chemical etching – Mould Polishing techniques	8
3	**Mould Making Techniques:** Pantograph engraving – Hydro copying – Jig boring – CNC machines – CNC Lathe –CNC Milling – CNC EDM – Advantages and its Applications – Assembly of moulds – Rapid prototyping .	15
4	**Inspection and Quality Control of Moulds:** Introduction to Tool Room measuring instruments – Vernier – Micrometer – Height Gauge – Slip Gauge – Dial Gauge – Measuring tapers and angles – CMM.	10
5	**Mould Estimation, Repair and Protection :** Procedure for estimating mould cost – General outline – Cost calculation – Basic moulds – Cavity – Basic functional components – Special functions etc. Introduction – Mould Repair and maintenance – scheduling mould maintenance – advantages – storage – corrosion protection – wear and lubrication – special consideration.	11

Reference Books:

1. Cyril Donaldson George H. Lecain V C Goold, Tool Design, TATA McGraw-Hill, 1998.
2. Richard R. Kibbe John E. Neele, Roland O Meyer, Warran T. White, Machine Tool Practices, Prentice Hall of India Pvt. Ltd., 1999.
3. Irwin Rubin, Injection Moulded Theory and Practice, Wisely Interscience Publication, 1972.
4. Society of Plastics Industry, Plastics Engineering Hand Book, Van Nostrand Reinhold Company, 1960.
5. Dominick V. Rosato, Donald V. Rosato, Injection Moulding Hand Book, CBC Publishers & Distributors, 1987.

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Material selection for mould	15
CO-2	Choice of surface treatment	15
CO-3	Mould making..choice of machine and practical applicability	25
CO-4	Mould manufacturing .. Quality checks..practical aspects	15
CO-5	Mould Economics	15
CO-6	Maintenance of moulds	15

List of Open Source Software/learning website:

1. **www.sciencedirect.com**
2. **Mold flow software**
3. **Matlab / Solidworks softwares**