

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. SEMESTER : VII**  
**MANUFACTURING ENGINEERING**

**Subject Name: Design for Manufacture, Assembly and Environment**  
**Subject Code:173404**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
3	0	2	5	70	30	30	20

Sr No	Course Contents
<b>1</b>	<b>INTRODUCTION</b> General design principles for manufacturability - strength and mechanical factors, mechanisms selection, evaluation method, Process capability - Feature tolerances - Geometric tolerances - Assembly limits -Datum features - Tolerance stacks.
<b>2</b>	<b>FACTORS INFLUENCING FORM DESIGN</b> Working principle, Material, Manufacture, Design- Possible solutions – Materials choice - Influence of materials on form design - form design of welded members, forgings and castings.
<b>3</b>	<b>COMPONENT DESIGN - MACHINING CONSIDERATION</b> Design features to facilitate machining - drills - milling cutters - keyways – Doweling procedures, counter sunk screws - Reduction of machined area- simplification by separation - simplification by amalgamation - Design for machinability - Design for economy - Design for clampability - Design for accessibility - Design for assembly.
<b>4</b>	<b>COMPONENT DESIGN – CASTING CONSIDERATION</b> Redesign of castings based on parting line considerations - Minimizing core requirements, machined holes, redesign of cast members to obviate cores. Identification of uneconomical design - Modifying the design - group technology - Computer Applications for DFMA
<b>5</b>	<b>DESIGN FOR THE ENVIRONMENT</b> Introduction – Environmental objectives – Global issues – Regional and local issues – Basic DFE methods – Design guide lines – Example application – Lifecycle assessment – Basic method – AT&T's environmentally responsible product assessment - Weighted sum assessment method – Lifecycle assessment method – Techniques to reduce environmental impact – Design to minimize material usage – Design for disassembly – Design for recyclability – Design for remanufacture – Design for energy efficiency – Design to regulations and standards.

**REFERENCE BOOKS:**

1. Boothroyd, G, 1980 Design for Assembly Automation and Product Design. NewYork, Marcel Dekker.
2. Bralla, Design for Manufacture handbook, McGraw Hill, 1999.

3. Boothroyd, G, Hartz and Nike, Product Design for Manufacture, Marcel Dekker, 1994.
4. Dickson, John. R, and Corroda Poly, Engineering Design and Design for Manufacture and Structural Approach, Field Stone Publisher, USA, 1995.
5. Fixel, J. Design for the Environment McGraw Hill., 1996.
6. Graedel T. Allen By. B, Design for the Environment Angle Wood Cliff, Prentice Hall. Reason Pub., 1996.
7. Kevien Otto and Kristin Wood, Product Design. Pearson Publication, 2004.