Subject Code: 01ME0507
Subject Name: Design for Manufacturing
B. Tech. Year - III (Semester - 5)

Type of course : Engineering

Prerequisite : Workshop, MP – I, MP - II

Rationale : Understanding the importance of Design in Manufacturing.

Course Outcome :
After completion of this course, student will be able to

1. Understand the concept & role of Design in manufacturing.
2. Design different components/parts for manufacturing.
3. Identify application of different materials
4. Apply proper rules and criteria for designing of a component.
5. Design components for industrial applications

Teaching and Examination Scheme :

Teaching Scheme			Credits	Examination Marks					
				Theory Marks			Practical Marks		Total Marks
THEORY	TUTORIAL	PRACATICAL	C	ESE(E)	IA	CSE	Viva (V)	Term Work (TW)	
3	0	2	4	50	30	20	25	25	150

Content :

Sr. No.	Content	Total Hrs.
1	**Introduction:** Concepts of DFM Role of DFM Material and Process Selection	**06**
2	**Components Design** Design for Quality Design for Assembly Design for Cost Design for Performance Design for Biocompatibility Design for Ergonomics Design for Recycling and other factors.	**12**

3	**Methods of Material Selection** Material Selection on the basis of Engineering Properties Material Selection on the basis of material performance indices Material Selection on the basis of charts Evaluation of single and multi-attribute utilities.	**08**
4	**Design Rules** Design rules for material and process Part geometry and tolerances Shape factor Prototyping Computer aided Material Functional Modelling Mathematical optimization Formation of objective Constraint functions, factorial analysis.	**10**
5	**Case Studies** Case studies on product design Case study on manufacturing design. Case study on design of assembly.	**06**

Distribution of Theory Marks

R Level	**U** Level	**A** Level	**N** Level	**E`** Level	**C** Level
10	**20**	**25**	**25**	**10**	**10**

Legends: R: Remember**; U:** Understand**; A:** Apply**; N:** Analyze**; E:** Evaluate**; C**: Create

Reference books :

1. Material Selection in Mechanical Design by Michael Ashby.
2. Bralla, Design for Manufacture handbook, McGraw Hill, 1999
3. Product design and development, by K.T. Ulrich and S.D. Eppinger, Tata McGraw Hill
4. Boothroyd, G, 1980 Design for Assembly Automation and Product Design. New York, Marcel Dekker.
5. Kevien Otto and Kristin Wood, Product Design. Pearson Publication, 2004.
6. Boothroyd, G, Heartz and Nike, Product Design for Manufacture, Marcel Dekker, 1994.
7. Dickson, John. R, and Corroda Poly, Engineering Design and Design for Manufacture and Structural Approach, Field Stone Publisher, USA, 1995.
8. Fixel, J. Design for the Environment McGraw Hill., 1996.

List of Open Base Software / learning website :

1. http://nptel.ac.in/courses/112101005

2. https://ocw.mit.edu/index.htm