

**Subject Code: 01ME0507**

**Subject Name: Design for Manufacturing**

**B. Tech. (III Year) Semester- 5: Mechanical Engineering**

**Type of course:** Engineering

**Prerequisite:** Workshop, MP – I, MP - II

**Rationale:** Understanding the importance of Design in Manufacturing.

**Teaching and Examination Scheme:**

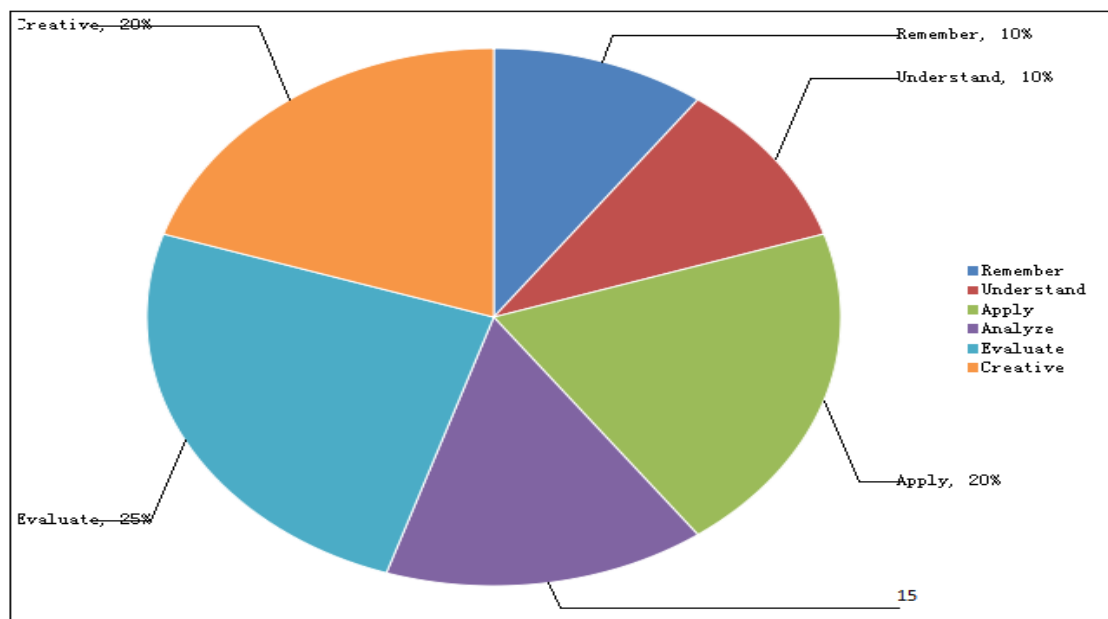
Teaching			Credits	Examination Marks					Total Marks
L	T	P		Theory Marks			Practical Marks		
			ESE	IA	CSE	VIVA	TW		
3	--	2	4	50	30	20	25	25	150

**Content**

No	Module	Topics	Weightage	Duration
1	Introduction	Concepts of DFM	15 %	6
		Role of DFM		
		Material and Process Selection		
2	Components Design	Design for Quality	30 %	12
		Design for Assembly		
		Design for Cost		
		Design for Performance		
		Design for Biocompatibility		
		Design for Ergonomics		
3	Methods of Material Selection	Material Selection on the basis of Engineering Properties	20 %	8
		Material Selection on the basis of material performance indices		
		Material Selection on the basis of charts		
		Evaluation of single and multi-attribute utilities.		
4	Design Rules	Design rules for material and process	25 %	10
		Part geometry and tolerances		
		Shape factor		
		Prototyping		
		Computer aided Material		
		Functional Modelling		
		mathematical optimization		
		formation of objective		
Constraint functions, factorial analysis.				

5	Case Studies	Case studies on product design	15 %	6
		Case study on manufacturing design.		
		Case study on design of assembly.		

R Level	U Level	A Level	N Level	E Level	Creative
10	10	20	15	25	20



### ReferenceBooks:

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. Kevin Otto and Kristin Wood, Product Design. Pearson Publication, 2004.
6. Boothroyd, G, Hertz 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.

**Course Outcome:**

After learning the course the students should 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.

**List of Open Source Software/learning website:**

1. <http://nptel.ac.in/courses/112101005>
2. <https://ocw.mit.edu/index.htm>