

PRODUCT DESIGN

Course Code	22MEMD2T6D	Year	I	Semester	II
Course Category	Programme Elective	Branch	ME	Course Type	Theory
Credits	4	L-T-P	4-0-0	Prerequisites	Nil
Continuous Internal Evaluation:	40	Semester End Evaluation:	60	Total Marks:	100

Course outcomes: At the end of the course, the student will be able to:

CO	Statement	BTL	Units
CO1	Apply various tools of problem solving to arrive at a fruitful design	L3	1
CO2	Analyze the factors influencing the design.	L4	2
CO3	Determine the risk and reliability aspects associated with product design.	L3	3
CO4	Select appropriate manufacturing processes to realize the product design	L3	4
CO5	Evaluate various modes of product testing	L4	4

Contribution of Course outcomes towards achievement of programme outcomes & Strength of correlations (High:3, Medium: 2, Low:1)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	3	3								2	2	3	1
CO 2	3	3	3								2	2	3	1
CO 3	3	3	3								2	2	3	1
CO 4	3	3	3								2	2	3	1
CO 5	3	3	3								2	2	3	1

Syllabus		
Unit	Contents	Mapped CO
1	PRODUCT DESIGN PROCESS: Design process steps, problem-solving process, creative problem solving, invention, brainstorming, morphological analysis, behavioral aspects of decision making, decision theory. MODELING AND SIMULATION: Triz, role of models in engineering design, mathematical modeling, similitude and scale models, geometric	CO1

	modeling on computer, finite-element analysis.	
2	MATERIAL SELECTION: Material selection for new product design, role of processing in design, design for manufacture, design for assembly. DESIGN FOR ENVIRONMENT: Need of Design for Environment, techniques to reduce environment impact	CO2
3	RISK AND RELIABILITY: Risk and society, Hazard analysis, fault tree analysis. failure analysis and quality: causes of failures, failure modes, failure mode and effect analysis, FMEA procedure, Product liability, Intellectual property	CO3
4	PRODUCT TESTING: Thermal, vibration, electrical, and combined environments, temperature testing, vibration testing, test effectiveness, accelerated testing and data analysis, accelerated factors, Weibull probability plotting, testing with censored data.	CO4, CO5

Learning Resources

Text Book(s):

- 1 Engineering Design by George E. Dieter, Mc Graw-Hill.
2. Product Design by Kevin Otto, Pearson Education, 2014.

References:

1. The Product Management Handbook by Richard S. Handscombe, Mc Graw-Hill.
2. New Product Design and development by Ulrich Eppinger, TMH.
3. Engineering Design Principles by Ken Hurst, Elsevier. 4. Product Integrity and Reliability in Design by John W. Evans and Jillian Y. Evans, Springer

Course coordinator:

HOD