

PRODUCT DESIGN

Course Code	19ME4702B	Year	IV	Semester	I
Course Category:	Professional Core	Branch	ME	Course Type	Theory
Credits:	3	L – T – P	3 – 0 – 0	Prerequisites:	Nil
Continuous Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Illustrate the product design and development processes in manufacturing industry.	L2
CO2	Discuss about the components and their functions of product design processes	L2
CO3	Plan a product design	L3
CO4	Apply industrial design techniques in product development	L3
CO5	Carry out cost and benefit analysis through various cost models and then apply new product development process during pre-market phase of extended product life cycle.	L3

Course Articulation Matrix:

	Contribution of Course Outcomes towards achievement of Program Outcomes													
	Strength of correlations (3: High, 2: Moderate, 1: Low)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	-	-	-	-	-	-	-	2	2	3	1
CO2	3	3	3	-	-	-	-	-	-	-	2	2	3	1
CO3	3	3	3	-	-	-	-	-	-	-	2	2	3	1
CO4	3	3	3	-	-	-	-	-	-	-	2	2	3	1
CO5	3	3	3	-	-	-	-	-	-	-	2	2	3	1

Course Content		Mapped COs
UNIT-1	Introduction: Design methodology and philosophy, types of design, design models, development product life cycle. Product development process, reverse engineering and redesign of product development process, theory and methodology in design.	CO1
UNIT-2	Design Process: Need, analysis, scope of the product, mission statement, customer study, Kano- diagram. Establishing product function, functional decompositions, FAST and SOP, functions structures. Building up a design team. Designing quality into product, product discovery.	CO2
UNIT-3	Plan for Design: Product teardown, planning for deliverables, building a plan, product specifications- QFD, contradiction to generate ideas, theory of inventive machines-TRIZ, Decision matrix.	CO3
UNIT-4	Industrial Design: Need for industrial design – impact – design process –	CO4

	investigation of customer needs – conceptualization – refinement – management of the industrial design process – technology driven products – user driven products – assessing the quality of industrial design.	
UNIT-5	Value Engineering: Cost evaluation, categories of cost, overhead cost, methods of development cost estimate, manufacturing cost, value analysis costing. New Product Development Process: Expanded product life cycle, Flow chart for new product development, Models utilized in various phases of new product development.	CO5

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. A K Chitale and R C Gupta, Product Design and Manufacturing, Prentice Hall of India, New Delhi, 2003. 2. Kevin Otto and Kristin Wood, Product Design, Pearson, 2004.
Reference Books:	<ol style="list-style-type: none"> 1. Ulrich and Steven D. Eppinger, Production Design and Development, Tata McGraw Hill, 2007. 2. David G. Ullman, The Mechanical Design Process, McGraw Hill, 2003. 3. George E. Dieter, Engineering Design, McGraw Hill, 2000.
E-Resources & other digital Material:	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses/112/107/112107217/ 2. https://www.classcentral.com/course/swayam-product-design-and-development-7922