

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	OMED626	Product Design and Manufacturing	3	0	0	3

Prerequisites
Bachelor/Master/PhD students having background in Mechanical Engineering/Production Engineering/Manufacturing Technology/Other Engineering disciplines.
Course Objective
At the end of the course, the students will be able to: 1. To study the Visual Design, and Quality Function Deployment (QFD) 2. To understand the Design for Manufacturing, Assembly, and Environment, and analytical tools for development, costing and manufacturing. 3. To gain expertise in conceptualization, design, and manufacture competitively priced quality products. 4. Reverse Engineering, Prototyping and simulation using soft tools. 5. Learn Advanced methods in manufacturing.
Learning Outcomes
1. Managing the product development process, right from idea generation to final product manufacturing. 2. Understands the Design for Manufacturing, Assembly, and Environment, and analytical tools for development, costing and manufacturing. 3. How to use the Reverse Engineering, Prototyping and Simulation using soft tools 4. Understand the advanced methods in manufacturing

Unit No.	Topics to be covered	No. of Lecture Videos	Video Time (Minutes)	Learning out come
1	Introduction to Product Design and Manufacturing [Overview of Product Design and Manufacturing, Fundamentals of Manufacturing towards Product Development]	4	135	Building foundation for the Product Design and Manufacturing and Fundamentals of Manufacturing.
2	Product Design Morphology [Engineering Design Process, Product Design Morphology, Product Characteristics]	3	124	To understand the Engineering Design Process, Product and it's characteristics
3	Visual Design, and Quality Function Deployment (QFD) [Elements of Visual Design, Translating Customer Needs]	5	193	This unit will help students to understand Virtual Design elements and how to Translate the Customer Needs into Product Design
4	Value Engineering [Introduction to Value Engineering, Value Engineering Methodology, Case Study]	5	189	The student will understand the Value Engineering, Methodology along with a Case Study
5	Material, and Manufacturing process selection [Material Selection, Manufacturing Process Selection, Product Costing]	5	175	Understanding about the concepts of Material Selection, Manufacturing Process and Product Costing
6	Design for Manufacturing, Assembly, and Maintenance [Design for Manufacturing, Design for Assembly, Design for Maintenance]	3	129	To understand the Design for Manufacturing, Assembly, and the Maintenance

7	Design for Environment, and Quality Control [Design for Environment, Quality Control, Quality Assurance]	4	163	Here to understand the Design for Environment, Quality control and Quality Assurance
8	Patenting, and Creativity [Patent, Creativity and Frugal Innovation]	5	153	Student will learn about the basic concepts of Patenting, Creativity and Frugal Innovation
9	Rapid Prototyping [Introduction to Rapid Prototyping, Rapid Prototyping Modelling, Rapid Prototyping Processes]	4	135	Get an overview of the Rapid Prototyping, Modelling and Processes
10	Plant Layout Design [Laboratory Demonstration, 3D Printing, Layout Planning]	5	191	To understand the process of 3D Printing, Layout Planning
11	Computer Integrated Manufacturing [Laboratory Demonstration, Plant Simulation, Computer Integrated Manufacturing]	5	214	Understanding about the Plant Simulation and Computer Integrated Manufacturing
12	Reverse Engineering, and Managing Competitiveness [Reverse Engineering, Managing Competitiveness]	2	90	Get and overview of the Reverse Engineering, and Manage the competitiveness
Total		50	1891	

Text Books:

1. Eppinger, S. and Ulrich, K., Product Design and Development, McGraw-Hill Higher Education, 2015.
2. Magrab, E.B., Gupta, S.K., McCluskey, F.P. and Sandborn, P., Integrated Product and Process Design and Development: The Product Realization Process, CRC Press, 2009.

Reference Books:

1. Boothroyd, G., Product Design for Manufacture and Assembly, Computer-Aided Design, 26(7), pp.505-520, 1994.
2. Ulrich, K.T. and Eppinger, S.D., Product Design and Development, McGraw-Hill, 7th Edition.
3. Cagan, J. and Vogel, C.M., Creating Breakthrough Products: Innovation from Product Planning to Program Approval, Pearson Education.