

B.E Semester: 7 Automobile Engineering
Subject Name: Product Design & Value Engineering (MA704-N-B)
[Dept. Elect.-4]

Course Objective:

- To present a problem oriented in depth knowledge of Product Design & Value Engineering.
- To address the underlying concepts, methods and application of Product Design & Value Engineering.

B. Teaching / Examination Scheme:

Teaching Scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
3	0	0	3	3	3	70	30	20	0	120

C. Detailed Syllabus:

Unit No.	Details
1	Product Design: Introduction, Product life cycles, Characteristics of Successful Product development, Design and development of Products, Types of Design and Redesigns, Engineering Designs, Duration and cost of product development, the challenges of Product development.
2	Product Design for Manufacturing and Assembly: Methods for designing for manufacturing and assembly, design for Maintainability, Design for Environment, Legal factors and social issues, Engineering Ethics and Issues of society related to design of products, Design for safety, Vision and Illumination design: Climate, Noise, Motion, Sound and Vibration, Product Costing
3	Product Development Processes and Product Planning: A Generic development process, concept development, the front end process, adopting the generic product development process, The Product Planning Process,
4	Product Analysis and Material Selection: Tools and charts used for product analysis like bill of materials, gozinto chart, performance characteristics of materials, material selection process, sources of information on material properties, economics of materials, evaluation methods for material selection
5	Identifying Customer Needs: Customer Satisfaction, Voice of customer, Customer Populations, Types of customer needs, Customer need models. Gathering Customer needs: Need Gathering Methods, Conducting Interviews: Like Dislike Method, Articulated-Use Method, Product feel and Industrial Design, Organizing and Prioritizing Needs: Grouping Interpreted needs, Affinity Diagram, Determining need Importance, Customer use patterns, Customers need Documentation.
6	Value Engineering: Definition, Value Engineering Function: Approach of Function, Evaluation of Function, Determining Function, Classifying Function, Evaluation of costs, Evaluation of Worth, Determining Worth, Evaluation of Value, FAST Diagramming

Total hours (Theory):48

Total hours (Practical):00

Total hours:48

D. Lesson Planning:

Sr. No.	Date/Week	Unit	Weight age	Topic No
1	1 st , 2 nd , 3 rd	Unit 1,2	20%	1
2	4 th , 5 th , 6 th	Unit 3,4	20%	2,3
3	7 th , 8 th , 9 th	Unit 5,6	20%	4,5
4	10 th , 11 th , 12 th	Unit 7,8	20%	6
5	13 th , 14 th , 15 th , 16 th	Unit 9	20%	7

E. Instructional Method & Pedagogy

1	At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2	Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal Weight age should be given to all topics while teaching and conduction of all examinations.
3	Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4	One/Two internal exams may be conducted and total/average/best of the same may be converted toequivalent of 30 marks as a part of internal theory evaluation.
5	Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6	Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overallinternal evaluation.

F. Students Learning Outcomes:

1	Confidence to create new product based on mechanical design engineering.
2	Students will have knowledge of all mechanical aspects of product design by incorporating concept, creativity, structural, manufacturing, esthetic etc.
3	Students will have ability to solve open-ended problem belongs to design engineering that meet the requirements.
4	Students will have ability to understand contemporary issues and their impact on provided solution.

G. Text Books & Reference Books:

1	Product Design, by Kevin Otto, Kristin wood, Pearson Education Inc..
2	Product design and development, by K.T. Ulrich and S.D. Eppinger, Tata McGraw Hill
3	Product Development, by Chitale & Gupta, Tata McGraw Hill
4	The Mechanical Process Design, by David Ullman, McGraw hill Inc
5	Engineering Design Process, by Yousef Haik, T M M Shahin, Cengage Learning

6	Product design & process Engineering by Niebel & deeper, McGraw hill
7	Value Management by Heller, Addison Wasley
8	Value Engineering A how to Manual S. S. Iyer, New age International Publishers
9	Value Engineering : A Systematic Approach by Arthur E. Mudge - Mc GrawHill 10
10	New Product Development Timjones. Butterworth Heinmann, Oxford
11	Value Engineering A how to Manual S. S. Iyer, New age International Publishers
12	Value Engineering : A Systematic Approach by Arthur E. Mudge - Mc GrawHill
13	Assembly automation and product design – by Geoffrey Boothroyd, CRC Taylor & Francis