

B.E Semester: VIII

Mechanical Engineering

Subject Name: Product Development & Value Engineering

A. Course Objective

- To develop a solution oriented approach by in depth knowledge of Product Development & Value Engineering.
- To address the underlying concepts, methods and application of Product Development & Value Engineering.

B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
ME805-C	Product Development & Value Engineering	4	0	0	4	4	3	70	30	20	0	120

C. Detailed Syllabus

1. Product Design Introduction:

Characteristics of successful product development, Design and development of products, duration and cost of product development, the challenges of product development.

2. Development Processes and Organizations:

A generic development process, concept development: the front-end process, adopting the generic product development process, the AMF development process, product development organizations, the AMF organization.

3. Product Planning:

The product planning process, identify opportunities, Evaluate and prioritize projects, allocate resources and plan timing, complete pre project planning, reflect all the results and the process.

4. Identifying Customer Needs:

Gather raw data from customers, interpret raw data in terms of customer needs, organize the needs into a hierarchy, establish the relative importance of the needs and reflect on the results and the process.

5. Product Specifications:

What are specifications, when are specifications established, establishing target specifications, setting the final specification.

6. Design for stiffness and rigidity, design for production, designing with plastics, rubber, ceramics, glass and wood.

7. Value Engineering Introduction:

Definition, value engineering recommendations, programs, advantages, Evaluation of function, determining function, classifying function, evaluation of costs, evaluation of worth, determining worth, evaluation of value.

8. Value Engineering Job Plan:

Introduction, orientation, information phase, Function phase, creation phase, evaluation phase, Investigation phase, implementation phase, speculation phase, analysis phase.

9. Selection of Evaluation of Value Engineering Projects:

Project selection, Methods selection, value standards, application of Value Engineering methodology.

10. Initiating Value Engineering Program:

Introduction, training plan, career development for Value Engineering specialties.

11. Fast Diagramming:

Cost models, life cycle costs.

12. Value Engineering level of Effort:

Value Engineering team, Co-ordinator, designer, different services, definitions, construction management contracts, value engineering case studies.

D. Lesson planning

<u>SR. NO.</u>	<u>DATE/WEEK</u>	<u>UNIT NO.</u>	<u>%WEIGHTAGE</u>	<u>TOPIC NO.</u>
1	1 ST , 2 ND , 3 RD	1, 2, 3	20	1, 2, 3
2	4 TH , 5 TH , 6 TH	4, 5, 6	20	4, 5, 6
3	7 TH , 8 TH , 9 TH	7, 8, 9	20	7, 8, 9
4	10 TH , 11 TH , 12 TH	10, 11	20	10, 11
5	13 TH , 14 TH , 15 TH	12	20	12

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 weightage 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 to equivalent 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 overall internal evaluation.
7. The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
8. **Practical / Oral:** Term work shall be carried out to fulfill the practical credits related to course contents.

F. Students Learning Outcomes

- The student can identify different areas of Product Development & Value Engineering.
- Can find the applications of all the areas in day to day life.

G. Recommended Study Materials

Text & Reference Books:

1. Product Design and Development, Karl.T.Ulrich, Steven D Eppinger, Anita Goyal Tata Mc Graw Hill, New Delhi-2009
2. Product Design and Manufacturing, A C Chitale and R C Gupta, Prentice Hall New Delhi 2011.
3. Value Engineering A how to Manual S.S.Iyer, New age International Publishers 2009
4. Product development - Kevin otto and Kristini wood Pearson Education 2004
5. Value Engineering : A Systematic Approach by Arthur E. Mudge - Mc Graw Hill
6. New Product Development Timjones. Butterworth Heinmann, Oxford. UCI. 1997