

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MECHANICAL ENGINEERING**  
**B. E. SEMESTER: VII**

Subject Name: **Product Design and Value Engineering**

Subject Code: **171904**

<b>Teaching Scheme</b>				<b>Evaluation Scheme</b>			
<b>Theory</b>	<b>Tutorial</b>	<b>Practical</b>	<b>Total</b>	<b>University Exam (E)</b>		<b>Mid Sem Exam (Theory) (M)</b>	<b>Practical (Internal)</b>
				<b>Theory</b>	<b>Practical</b>		
3	2	0	5	70	30	30	20

<b>Sr. No</b>	<b>Course Content</b>	<b>Total Hrs.</b>
<b>1.</b>	<p><b>Product Design Introduction:</b></p> <p>Characteristics of successful product development, Design and development of products, duration and cost of product development, the challenges of product development</p>	03
<b>2.</b>	<p><b>Development Processes and Organizations:</b></p> <p>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.</p>	03
<b>3.</b>	<p><b>Product Planning:</b></p> <p>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.</p>	04
<b>4.</b>	<p><b>Identifying Customer Needs:</b></p> <p>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.</p>	03
<b>5.</b>	<p><b>Product Specifications:</b></p> <p>What are specifications, when are specifications established, establishing target specifications, setting the final specification.</p>	03
<b>6.</b>	<p>Design for stiffness and rigidity, design for production, designing with plastics, rubber, ceramics, glass and wood</p>	10

7.	<b>Value Engineering Introduction:</b> Definition, value engineering recommendations, programmes, advantages, Evaluation of function, determining function, classifying function, evaluation of costs, evaluation of worth, determining worth, evaluation of value.	04
8.	<b>Value Engineering Job Plan:</b> Introduction, orientation, information phase, Function phase, creation phase, evaluation phase, Investigation phase, implementation phase, speculation phase, analysis phase.	03
9.	<b>Selection of Evaluation of Value Engineering Projects:</b> Project selection, Methods selection, value standards, application of Value Engineering methodology.	03
10.	<b>Initiating Value Engineering Programme:</b> Introduction, training plan, career development for Value Engineering specialties.	03
11.	<b>Fast Diagramming:</b> Cost models, life cycle costs.	02
12.	<b>Value Engineering level of Effort:</b> Value Engineering team, Co-ordinator, designer, different services, definitions, construction management contracts, value engineering case studies.	04

### **Term Work:**

The term work shall be based on the topics mentioned above.

### **Practical / Oral:**

The candidate shall be examined on the basis of term-work.

### **Text Books:**

1. Product Design and Development, Karl.T.Ulrich, Steven D Eppinger, Anita Goyal Tata McGrawHill, 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

### **Reference Books:**

1. Product development - Kevin otto and Kristini wood Pearson Education 2004
2. Value Engineering : A Systematic Approach by Arthur E. Mudge - Mc GrawHill
3. New Product Development Timjones. Butterworth Heinmann, Oxford. UCI. 1997