

# GUJARAT TECHNOLOGICAL UNIVERSITY

## MECHANICAL ENGINEERING

### B. E. SEMESTER: VII

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

Subject Code: **171904**

| Teaching Scheme |          |           |       | Evaluation Scheme   |           |                           |                      |
|-----------------|----------|-----------|-------|---------------------|-----------|---------------------------|----------------------|
| Theory          | Tutorial | Practical | Total | University Exam (E) |           | Mid Sem Exam (Theory) (M) | Practical (Internal) |
|                 |          |           |       | Theory              | Practical |                           |                      |
| 3               | 2        | 0         | 5     | 70                  | 30        | 30                        | 20                   |

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

|            |  |    |
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| <b>7.</b>  | <b>Value Engineering Introduction:</b><br><br>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 |
| <b>8.</b>  | <b>Value Engineering Job Plan:</b><br><br>Introduction, orientation, information phase, Function phase, creation phase, evaluation phase, Investigation phase, implementation phase, speculation phase, analysis phase.  | 03 |
| <b>9.</b>  | <b>Selection of Evaluation of Value Engineering Projects:</b><br><br>Project selection, Methods selection, value standards, application of Value Engineering methodology.  | 03 |
| <b>10.</b> | <b>Initiating Value Engineering Programme:</b><br><br>Introduction, training plan, career development for Value Engineering specialties.   | 03 |
| <b>11.</b> | <b>Fast Diagramming:</b><br><br>Cost models, life cycle costs.   | 02 |
| <b>12.</b> | <b>Value Engineering level of Effort:</b><br><br>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