GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (Advanced Manufacturing Systems)

Subject Name: **Product Development and Innovation (Major Elective II)**
Subject Code: **1725003**

Sr_No	Content
1.	**Introduction:** Significance of product design, product design and development process, sequential engineering design method, Challenges of product development, Need for product Innovation.
2.	**Product Planning and Project Selection:** Identifying opportunities, evaluate and prioritize projects, allocation of resources.
3.	**Identifying Customer Needs:** Interpret raw data in terms of customers need, organize needs in hierarchy and establish the relative importance of needs.
4.	**Product Specifications:** Establish target specifications, setting final specifications.
5.	**Concept Generation:** Activities of concept generation, clarifying problem, search both internally and externally, explore the output.
6.	**Industrial Design:** Assessing need for industrial design, industrial design process, management, assessing quality of industrial design.
7.	**Concept Selection:** Overview, concept screening and concept scoring, methods of selection.
8.	**Theory of inventive problem solving (TRIZ):** Fundamentals, methods and techniques, General Theory of Innovation and TRIZ, Value engineering Applications in Product development and design, Model-based technology for generating innovative ideas.
9.	**Concept Testing:** Elements of testing: qualitative and quantitative methods including survey, measurement of customers' response.
10.	**Intellectual Property:** Elements and outline, patenting procedures, claim procedure.
11.	**Design for Environment:** Impact, regulations from government, ISO system.

Text books:

1. Ulrich K. T, and Eppinger S.D, Product Design and Development, Tata McGraw Hill
2. Otto K, and Wood K, Product Design, Pearson
3. Engineering of creativity: introduction to TRIZ methodology of inventive Problem Solving, By Semyon D. Savransky, CRC Press.

Reference Books:

1. Product Design and Manufacturing by A.K.Chitale, R.C.Gupta, PHI.
2. Inventive thinking through TRIZ: a practical guide, By Michael A. Orloff, Springer**.**
3. Systematic innovation: an introduction to TRIZ ; (theory of inventive Problem Solving), By John Terninko, Alla Zusman, CRC Press