

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (CAD/CAM)

Subject Name Product Design & Development

Sr.No	Course content
1.	Importance of product design, type of design product definition, product specification, Phases of product development: conceptual, embodiment and detailed design, product and technology development cycle, concept generation and evaluation methods.
2.	Material selection– Importance, classification material performance characteristic, selection criteria Ashby Material selection chart.
3.	Process selection – Importance types of manufacturing process and their classification Sources of information selection criteria Material and Process selection Methods, Expert systems. Computer Database Approach, performance indices decision matrix, AHP and fuzzy approach introduction to material and process selection software.
4.	Benchmarking – DFM, DFA, DFX, supplier involvement robust design, QFD and concurrent engineering.
5.	Mathematics of Times Value of Money Cost Comparison Depreciation Taxes. Inflation profitability of Investment and Investment Decision Analysis Sensitivity Analysis. Methods of cost Estimates Industrial Engineering Approach parametric Approach, Introduction to Assembly Modeling. Top-Down and Bottom-Up Approaches of AM. Mating Conditions Representation Schemes. Generation of Assembly Sequences.
6.	Product Development Cycle and Importance of Prototyping. Types of prototypes. Principal and advantages & Different Type of Generative Manufacturing process, Viz. Stereo lithography. FDM, SLS etc. Factors Concerning to RP: Consideration for Adoptions, Advantages, Accuracy and Economic Consideration.

REFERENCE BOOKS:

- 1 Product Design and Manufacturing by A.K.Chitale, R.C.Gupta, PHI.
- 2 Product Design and Development by Ulirich Karl T. and Eppinger Steven D, McGraw Hill.
- 3 Engineering Design by Dieter George E., McGraw Hill.
Handbook of Product Design for Manufacturing by Bralla, James G, McGraw Hill.