

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (Advanced Manufacturing Systems)

Subject Name: **Rapid Prototyping (Major Elective III)**

Subject Code: **1725008**

Sr_No	Content
1.	Product Development Cycle:
2.	Influence of Innovations on Product Development: Impact on economy, export competitiveness, design as a strategy to win international market and Innovation process
3.	Rapid Product Development-As Overview: virtual prototyping and testing technology, Physical Prototyping and Rapid Manufacturing technologies and Synergic Integration Technologies
4.	Virtual Prototyping and Testing: • Geometric Modeling: Types of Geometric models and Solid Models • Reverse Engineering: Acquiring Point Data, Constructing 3D model and Applications. Virtual augmented reality: Requirement of devices and technologies and applications • Computer Aided Engineering: Application of FEA in Engineering, the concept of discretization, steps in FEA and automatic mesh generation. • Design for X: Design for manufacture and design for assembly and other facets of DFX
5.	Physical Prototyping and Rapid Manufacturing: • Computer Numerical Control: Comparison between NC and conventional machines, features of CNC Machine Tool and programming • Robotics: Classification, programming, sensors and applications • Computer Aided Process Planning: Methodology, evaluation, types, CAD/CAM Integration and CAPP Features • Rapid Prototyping: dawn of slice age, benefits, applications, important issues and popular RP process • Rapid Tooling: Indirect rapid tooling process
6.	Synergic Integration Concurrent Engineering: • Benefits, methodology, integration and transactions • Product Data Management: Product data classifications, Process Management and benefits • Computer Integrated Manufacturing: Components, barriers to CIM. Implementation, case study, development and research

7.	Rapid Prototyping and Rapid Tooling: • Methods, Stereo lithography, Fused-deposition modeling, Selective laser sintering, Laminated-object manufacturing, Ballistic particle Manufacturing, Solid-base curing and Direct manufacturing and rapid tooling
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Text Book:

1. Rapid Product Development- Synergic integration of time-compression technologies
K. P. Karunakaran, V. P. Bapat, Sreenath Babu Akula P. D. Solanki Gaurav Gupta, V.R. Prasanth, Saket Anand, Arnab Sarkar and S. Venkatkrishnan

Reference Book:

1. Manufacturing Processes for Engineering Materials by Serope Kalpakjian and Steven R. Schmid- Pearson Education.