

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Semester: 2

Mechanical Engineering (Advanced Manufacturing Systems)

Subject Name: **Tool Design (Major Elective III)**

Subject Code: **1725007**

Sr_No	Content
1.	Cutting Tool Materials: Introduction and desirable properties, Carbon and Medium-Alloy Steels, High-Speed Steels, Cast-Cobalt Alloys, Carbides, Coated Tools, Alumina-Based Ceramics, Cubic Boron Nitride, Silicon-Nitride Based Ceramics, Diamond, Reinforced Tool Materials, Cutting-Tool Reconditioning
2.	Design of Cutting Tools: Basic Requirements, Mechanics and Geometry of Chip Formation ,General Considerations for Metal Cutting ,Design of single point Cutting Tools ,Design of Milling Cutters ,Design of Drills and Drilling, Design of Reamers, Design of Taps, Design of Inserts ,Determining Shank Size for Single-point Carbide Tools, Determining the Insert Thickness for Carbide Tools ,Chip Breakers ,Design of form tools
3.	Gages and Gage Design: Limits, fits and tolerances, Geometrical tolerances-specification and measurement, Types of gages, Gage design, gage tolerances, Material for Gages
4.	Work Holding Devices: Basic requirements of work holding devices, Location: Principles, methods and devices, Clamping: Principles, methods and devices
5.	Drill Jigs: Definition and types of Drill Jigs, Chip Formation in Drilling, General Considerations in the Design of Drill Jigs, Drill Bushings, Drill Jigs, and Modern Manufacturing
6.	Design of Fixtures: Fixtures and Economics ,Types of Fixtures ,Milling Fixtures ,Boring Fixtures , Broaching Fixtures ,Lathe Fixtures ,Grinding
7.	Tool Design for Numerically Controlled Machine Tools: Fixture Design for Numerically Controlled Machine Tools, Cutting Tools for Numerical Control, Tool-holding Methods for Numerical Control

Text Books:

1. ASTME, “Fundamentals of Tool Design”, Prentice Hall of India Pvt. Ltd.
2. Donaldson. “Tool Design”, Tata-McGraw Hill

Reference Books:

1. Machine Tool Practices By Kiffe,et al
2. Machine Tool Technology By K S Yadav