

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Mechanical (Production Engg.)

Semester: II

Subject Name: **Computer Aided Design for Machine Component**
(Inter Disciplinary Elective-II)

Subject Code: **1722805**

Sr. No.	Course Content
1	Introduction: Need and Scope of Computer Aided Machine Design
2	Computer graphics: Principles of interactive computer graphics and overview Of hardware available for use in CAD; Scan conversion; Bresenham's Algorithm for line, circle, Geometric transformations- 2D and 3D translation, scaling, rotation, shear and reflection, homogeneous transformations
3	Geometric modelling: Types of mathematical representation of curves, wire frame models wire frame entities parametric representation of synthetic curves Hermit cubic splines Bezier curves, B-splines rational curves. Representations : B-rep and C-rep, Feature based modelling.
4	Surface modeling: Mathematical representation surfaces, Surface model, Surface entities surface representation, Parametric representation of surfaces, plane surface, rule surface, surface of revolution, Tabulated Cylinder.
5	Geometric modelling-3D: Solid modeling, Solid Representation, Boundary Representation (B-rep), Constructive Solid Geometry (CSG).
6	Solid modeling using software: Solid modeling of components and Assembly using CAD software such as ProEngineer / Inventor Professional / Mechanical Desktop
7	Computer aided design of machine components: To develop computer programs using 'C'/ 'C++' Programming language for the machine components such as shafts, springs, couplings, clutches, brakes, levers, gears, belts
8	Engineering optimization: Optimum design of Machine Elements, Johnson's method, single variable and multi variable optimization techniques. Single objective and Multi-objective functions related to machine component design

Reference Books:

1. CAD/CAM Theory and Practice by Ibrahim Zeid & R.Sivasubramanian, Tata Mc Graw Hill international.
2. Geometric Modelling, Mortenson, M.E., John Wiley & Sons, NY, 1985.
3. David F. Rogers and J. Alan Adams, "Mathematical Elements for Computer Graphics", McGraw-Hill.
4. Mastering CAD/CAM / Ibrahim Zeid / Mc Graw Hill international. CAD/CAM / P.N. Rao / TMH.
5. Engineering Optimization by S.S.Rao.
6. Engineering Optimization by Kalyanmoy Deb.
7. Design of Machine Elements by C.S. Sharma & Kamlesh Purohit, PHI Publications.