**ME 307 Computer Aided Design [3–0–0–4]** ***Prerequisites: DS 202***

Overview of Transformations, Projections, Curves, Surfaces and Solids.
Differential Geometry applied to Curve and Surface Design.
**Curves:** Non uniform B-Spline (NUB) Curve Models, Rational Curves, Non Uniform Rational B-spline (NURB), Properties of Bezier curves. Manipulation of Curves.
**Surfaces:** Quadric Surfaces, Blending, Sculptured, Coons patches, Rational Parametric, NUB, NURB, Polygonal and Quadric Representation of Surfaces. Curves on Surfaces, Surface with Irregular Boundaries, Manipulation of Surfaces.
Analytical and Relational Properties of Curves and Surfaces; Curves and Surfaces in Solids; Plane, Curve, Surface Intersections. Evaluation of some methods of Geometric Modeling.
Solid Modeling Fundamentals: Mathematical Models of Solids, Constructive Solid Geometry, Boundary Representation, Non-Manifold Geometry, Global Properties of Solid Model.
Geometric Modeling using Point Clouds.
CAD/CAM Data Exchange. Shape Grammar and the generation of the designs.

**Text Book:** Michael E. Mortenson, Geometric Modeling, Industrial Press Inc., 3rd Edition
**Reference Books:**


1. Ibraheim Zeid, CAD/CAM: Theory and Practice, TMH. Revised First Edition
2. I.D. Faux and M.J. Pratt, Computation Geometry for Design and Manufacture, John Wiley (Ellis Horwood Ltd.).
3. Choi, B.K, Surface Modeling for CAD/CAM, Elsevier.
4. Farin, Gerald, Curves and Surfaces for Computer Aided Geometric Design – A Practical Guide, Academic Press Inc.
5. Kunwoo Lee, Principles of CAD/CAM/CAE systems, Addison Wesley.
6. Yamaguchi, Curves and Surfaces in Computer Aided Geometric Design, Springer.
7. D. L. Ryan, Computer-Aided Graphics and Design, Marcel Dekker Inc.