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**COMPUTER AIDED DESIGN****Subject Code: 13ME2101****L P C**  
**4 0 3****Course Educational Objectives:**

1. To make the student learn the various types of geometric modeling techniques
2. To provide background knowledge necessary for the working of CAD software
3. To make the student understand advanced aspects of the computer aided design

**Course Outcomes:**

The student will be able to explain

1. the different types of modelling techniques
2. various design applications of machine components
3. the different formats of CAD/CAM data exchange
4. the principles and approaches of collaborative engineering

**UNIT-I**

CAD system: Product life cycle, scope of CAD/CAM, modeling approaches, coordinate systems, basic features, datum features, modeling strategies, model viewing, layers

Wireframe modeling: wireframe entities, curve representation, analytic curve, parametric representation of synthetic curves, Hermite cubic spline, Bezier curve, B-spline curve, curve manipulation

**UNIT-II**

Surface modeling: Surface entities, surface representation, surface analysis, analytic surface, plane surface, ruled surface, surface of revolution, tabulated cylinder

Synthetic surfaces, Hermite Bi-cubic surface, Bezier surface, B-Spline surface, Coons surface, blending surface, offset surface, surface manipulations – displaying, segmentation, trimming, intersection, transformations

**UNIT III**

Solid modeling: Solid entities, geometry and topology, solid representation, Boundary representation (B-rep), Constructive Solid Geometry (CSG), sweep representation, solid manipulations

**UNIT-IV**

Design applications: Mechanical tolerances, mass properties on CAD system, assembly modelling, assembly tree, assembly planning, mating conditions, bottom-up assembly approach, top-down assembly approach, assembly analysis

**UNIT V**

Collaborative engineering: Distributed computing, virtual reality modelling languages, collaborative design, principles, approaches, tools, design systems

CAD/CAM data exchange: Types of translators, IGES, STEP, ACIS, DXF, processors

**TEXT BOOKS:**

1. Ibrahim Zeid, “*Mastering CAD/CAM*”, 1e, McGraw Hill International, 2008

**REFERENCES:**

1. Ibrahim Zeid, “*CAD/CAM Theory and Practice*”, 5e, McGraw Hill International, 2009.
2. P N Rao, “*CAD/CAM*”, 2e, Tata McGraw Hill, 2010