COMPUTER AIDED DESIGN

Course Code: 15ME2101   **L P C**
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Course Outcomes:
At the end of the course, the student will be able to
CO1: Explain CAD system and wireframe modeling techniques.
CO2: Describe different surface modeling techniques and surface manipulations.
CO3: Discuss different solid modeling techniques and solid manipulations.
CO4: Use various design applications of machine components.
CO5: Appraise the collaborative engineering and translate different formats of CAD/CAM data exchange.

UNIT-I   (10-Lectures)
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, parametric representation of analytic and synthetic curves, Hermite cubic spline, Bezier curve, B-spline curve, curve manipulation

UNIT-II   (10-Lectures)
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   (10-Lectures)
Solid modeling: Solid entities, geometry and topology, solid representation, Boundary representation (B-rep), Constructive Solid Geometry (CSG), sweep representation, solid manipulations

UNIT-IV   (10-Lectures)
Design applications: Mechanical tolerances, mass properties on CAD system, assembly modeling, assembly tree, assembly planning, mating conditions, bottom-up assembly approach, top-down assembly approach, assembly analysis

UNIT-V   (10-Lectures)
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