SCHEME OF COURSE WORK

Course Title	: Computer Aided Design		
Course Code	: 15ME2101	L T P C	: 3 0 0 3
Program:	: M.Tech.		
Specialization:	: CAD/CAM		
Semester	: I		

Course Outcomes (COs):

At the end of the course, the student will be able to

1	Explain CAD system and wireframe modeling techniques
2	Describe different surface modeling techniques and surface manipulations
3	Discuss different solid modeling techniques and solid manipulations
4	Use various design applications of machine components
5	Appraise the collaborative engineering and translate different formats of CAD/CAM data exchange

Program Outcomes (POs)

At the end of the program, the students in CAD/CAM will be able to

1. acquire fundamentals in the areas of computer aided design and manufacturing
2. apply innovative skills and analyze computer aided design and manufacturing problems critically
3. identify, formulate and solve design and manufacturing problems
4. carry out research related to design and manufacturing
5. use existing and recent CAD/CAM software
6. collaborate with educational institutions, industry and R&D organizations in multidisciplinary teams
7. apply project and finance management principles in engineering projects
8. prepare technical reports and communicate effectively
9. engage in independent and life-long learning and pursue professional practice in their specialized areas of CAD/CAM
10. exhibit accountability to society while adhering to ethical practices
11. act independently and take corrective measures where necessary

Course Outcome versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	S	S	M	M	M	M						
CO-2	S	S	S	M	S	M	M		M			
CO-3	S	S	S	S	S	M	M		M			
CO-4	M	M							M			
CO-5	M		M	M	M	M			M			

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

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Teaching-Learning and Evaluation

WEEK	TOPIC / CONTENTS	COURSE OUTCOMES	SAMPLE QUESTIONS	TEACHING-LEARNING STRATEGY	ASSESSMENT METHOD & SCHEDULE
1	CAD system: Product life cycle, scope of CAD/CAM, modeling approaches,	CO1	1. What are the different phases of product life cycle? 2. What are the different modeling approaches? 3. Differentiate between world coordinate system and working coordinate system. 4. What is the difference between analytic and synthetic curve?	Lectures, CAD software, PPT, Seminar	Assignment (week 7)
2	coordinate systems, basic features, datum features, modeling strategies, model viewing, layers	CO1			
3	Wireframe modeling: wireframe entities, curve representation, analytic curve, parametric representation of synthetic curves	CO1			
4	Hermite cubic spline, Bezier curve, B-spline curve, curve manipulation	CO1			
5	Surface modeling: Surface entities, surface representation, surface analysis	CO2	1. Explain the boundary condition of Bi-cubic surface patch. 2. Draw 5X4 Bezier surface. 3. Differentiate between trimming and segmentation in surface manipulation.	Lectures, CAD software, PPT, Seminar	
6	analytic surface, plane surface, ruled surface, surface of revolution, tabulated cylinder	CO2			
7	Synthetic surfaces, Hermite Bi-cubic surface, Bezier surface, B-Spline surface, Coons surface	CO2			
8	blending surface, offset surface, surface manipulations – displaying, segmentation, trimming, intersection, transformations	CO2			
9	Mid-Test 1	CO-1, CO-2			

10	Solid modeling: Solid entities, geometry and topology, solid representation	CO3	1. Explain the effect of topology and geometry on boundary models. 2. Differentiate between CSG and B-rep. 3. What are the different solid entities?	Lectures , CAD software, PPT, Seminar	
11	Boundary representation (B-rep), Constructive Solid Geometry (CSG), sweep representation, solid manipulations	CO3			
12	Design applications: Mechanical tolerances, mass properties on CAD system, assembly modelling	CO4	1. How to calculate the mass properties in CAD system? 2. What are the different mating conditions? Explain. 3. What is bottom-up assembly approach?	Lectures , CAD software, PPT, Seminar	Seminar (week 11-16)
13	assembly tree, assembly planning, mating conditions, bottom-up assembly approach	CO4			
14	top-down assembly approach, assembly analysis	CO4			
15	Collaborative engineering: Distributed computing, virtual reality modelling languages, collaborative design, principles	CO5	1. Explain different types of translators. 2. Explain the general structure of IGES file. 3. Explain virtual reality modeling languages. 4. What are the different collaborative principles and approaches?	Lectures , CAD software, PPT, Seminar	
16	approaches, tools, design systems CAD/CAM data exchange: Types of translators, IGES	CO5			
17	STEP, ACIS, DXF, processors	CO5			
18	Mid-Test 2	CO-3, CO-4, CO-5			
19/20	END EXAM	All Cos			