



**SECOND SEMESTER, 2018-2019**  
**COURSE HANDOUT (PART-II)**

07/01/2019

In addition to Part-I (General Handout for all courses appended to the time table), this portion gives further specific details regarding the course.

**Course Code: ME/MF F342**

**Name of the Course: Computer Aided Design**

**Instructor-In-Charge: SRINIVASA PRAKASH REGALLA**

**I. Scope and Objective of the Course**

CAD software and CAD hardware. Mathematical modeling of parametric curves, surfaces and solids, and their computer simulation on spreadsheets and using specialized solid modeling packages. CAD/CAM data exchange. Introduction to finite element analysis and FEM practice on a specialized CAE package. Rapid prototyping. Students will be required to do several assignments and one CAD project.

**II. Textbook**

1. Zeid , Ibrahim, “Mastering CAD/CAM”, Tata McGraw-Hill, 2007.

**III. Reference**

1. Srinivasa Prakash Regalla, “Computer Aided Analysis and Design”, IK International Publishers, New Delhi, 2010.
2. Chandrupatla, T. R., Belegundu, A. D., “Introduction to Finite Elements in Engineering”, 3<sup>rd</sup> Edition, Prentice Hall of India, 2005, New Delhi.

**IV. Course Contents**

S. No.	Learning Objectives	Learning Outcomes	No. of Lectures	Source
<b>Computer Aided Geometric Modeling and Design</b>				
1	CAD software and CAD hardware	Introduction, 3D modeling and viewing, modeling aids and tools, engineering drawings, CAD programming, Computer simulation tools, Primer on MATLAB	4	TB: Ch-1 to 4
2	Parametric Curves: Mathematical modeling and computer simulation	Geometric Modeling: Curves, theory and MATLAB modeling	4	TB: Ch-6
3	Parametric Surfaces: Mathematical modeling and computer simulation	Geometric Modeling: Surfaces and NURBS, theory and MATLAB modeling	4	TB: Ch-7 & 8



S. No.	Learning Objectives	Learning Outcomes	No. of Lectures	Source
4	Parametric Solids: Mathematical modeling and computer simulation	Geometric Modeling: Solids and Features, theory and Pro/E modeling	3	TB: Ch-9
<b>Integration of CAD and CAE with CAM</b>				
5	Introduction to FEM and practice: Modeling and analysis of solid mechanics and heat transfer problems using FEM packages	Fundamental concepts, matrix algebra and Gaussian elimination	3	TB: Ch-17 & RB1: Ch-11 & RB2
		One-dimensional problems	4	
		Two-dimensional problems	5	
		Beams and frames and 3D problems	3	
		Scalar field problems and dynamic considerations	5	
6	Introduction to Rapid Prototyping/Additive Manufacturing	Different RP/AM technologies, their Pro/Cons	2	RB1: Ch-17
7	CAD/CAM Data Exchange	Data exchange neutral formats, 2-D and 3-D geometric transformations	3	TB: Ch-12
	Total		4025	

#### V. Evaluation Scheme and Schedule

Component	%Weightage (Marks) (Total Marks=200)	Date	Type
Mid-semester Test	25% (50 marks)	13/3, 9-10.30	CB
Practicals using COMSOL/Matlab/ANSYS	15% (30 marks)	As per Timetable	D208: CAD Lab
Tutorials	15% (30 marks)	Friday, 8 AM	OB
Class Room Interaction Quiz (CRIZ)	5% (10 marks)	Surprise	Using Google Classroom
Comprehensive Examination	40% (80 marks)	06/05/2019, FN	CB

**VI. Chamber Consultation Hour:** It will be announced in the class.

**VII. Notices concerning the course:** All notices concerning the course are displayed on the Mechanical Engineering notice board and/or CMS only.

**VIII. Make-up Policy:** Make up for any component of evaluation will be permitted only in genuinely serious cases only after production of necessary medical certificates and with prior permission.

**XI. Academic Honesty and Integrity Policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-In-Charge

