BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
SECOND SEMESTER, 2022-2023
COURSE HANDOUT (PART-II)

Date: 05-01-2023

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 G611**
***Name of the Course*: Computer Aided Analysis and Design**
***Instructor-In-Charge*: KURRA SURESH**
***Practical Instructor*: Gaurav Sharma**

I. Scope and Objective of the Course

The course aims at developing complete self reliance in solving analysis and design problems of engineering with the aid of computers. It stresses upon the use of more powerful tools including system planning, simulation and modeling. The student will take up a design project and will work independently on the project guided by the instructor or resource person as and when required. The effort must culminate with a CAAD program and a project report.

II. Textbooks

1. Rogers D. F. and J. A. Adams, "Mathematical Elements of Computer Graphics", Tata McGraw-Hill, New York, 2004.

III. References

1. Rao V. Dukkipati, Ananda Rao M. and Bhat R., "Computer Aided Analysis and Design of Machine Elements", New Age International Publishers, 2000.
2. Mortenson M. E., "Geometric Modeling", McGraw-Hill Education (India) Pvt. Ltd, 2006.
3. Srinivasa Prakash Regalla., "Computer Aided Analysis and Design", IK International Publishing House Pvt.Ltd, New Delhi.
4. Chapra S. and Canale R., "Numerical Methods for Engineers", Tata McGraw-Hill, New Delhi.
5. Ibrahim Zeid., "Mastering CAD/CAM" Tata McGraw-Hill, New Delhi.
6. Getting Started with **MATLAB** by **Rudra Pratap**
7. **Pro Engineer**-Wildfire 5.0 Instructor: **David Kelley**

IV. Course Contents

S. No.	Learning Objectives	Topic	Number of Lectures	Source
Fundamentals of Computer Aided Design and Geometric Modeling				
1.	CAD software and CAD hardware	Introduction, 3D modeling and viewing, modeling aids and tools, engineering drawings, CAD programming	3	RB 5: Ch-1-4

S. No.	Learning Objectives	Topic	Number of Lectures	Source
2.	Transformations	2-D and 3-D Geometric Transformations	5	TB1: Ch-2 & 3
3.	Parametric curves	Geometric Modeling: Curves, theory and MATLAB modeling	9	TB1: Ch-4 & 5
4.	Parametric surfaces	Geometric Modeling: Surfaces and NURBS, theory and MATLAB modeling	9	TB1: Ch-6
5.	Parametric solids	Geometric Modeling: Solids and Features, theory	2	RB2
6.	Rapid prototyping	Rapid Prototyping technologies	4	Class Notes
7.	Reverse engineering	Reverse engineering concepts	3	Class Notes
Computer Aided Analysis and Design of Machine Elements				
1.	Design Principles	Stress, Strain, Theories of failure	1	RB1: Ch-1, 2
2.	Numerical methods in design	Computer aided static, transient and dynamic analysis and design	3	RB1: Ch-4 to 6
3.	Optimization methods	Factorial and Taguchi designs	3	RB1: Ch-3
Total			42	

V. Evaluation Scheme and Schedule

Component	Duration	%Weightage	Date	Remarks
Mid-Test	90 min	25	14/03 9.30 - 11.00AM	Closed Book
Projects/Research papers/ Practicals	Semester long	40	As per Timetable	Open Book
Comprehensive Examination	120 min	35	10/05 FN	Closed Book

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

VII. Notices concerning the course: All notices concerning the course are displayed in CMS only.

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.

Academic Honesty and Integrity Policy: Academic honesty and Integrity are to be maintained by all the student's throughput the semester and no type of academic dishonesty is acceptable.

Instructor-In-Charge
ME G611