

Mechanical Engineering Department
Spring 2023
ME 103 Computer Aided Design I (3 credit hrs.)

Catalog Data: ME 103 Computer Aided Design I (3 credit hrs), Introduction to computer graphics user interface (GUI) for Computer Aided Design (CAD), Graphics visualization and interpretation; creating engineering drawings in two and three dimensions, solid modeling utilities, assembly for manufacturing fundamentals, basics on solid modeling, sweeps, blends, advanced topics in solid modeling, mechanical assembly and tolerances. Prerequisites: None, Co-requisite: None.

Textbook: Solid Edge 2020 for Designers, Sham Tickoo, CADCIM Technologies, 17th Edition, 2020, ISBN 978-1-64057-085-6

Instructor: Dr. Mohamed A. Seif, P.E.

Office: ETB 308

Class Times: 2:00 – 4:50 M Room 235 ETB

Office Hours: 11:00 - 2:00 M, W & 7:30 am – 9:30 am T, Th

Prerequisites: None

Educational Outcomes: At the end of the course, the student will be able to understand the basics of mechanical design, communicating the design through the representation of objects in two dimensional (2-D) and 3-D projections (isometrics blueprints). The student will develop the necessary skills to utilize modern computer aided design software for building up mechanical models used in Mechanical and Thermal systems design.

Objective 1: To teach students the basic principles underlying the mechanical design and computer utilization with CAD software [1, 2, 4, 5]

Objective 2: To train students to use computer software for basic mechanical design rendering. [1, 2, 4, 5]

Topics:

1. Mechanical Design and Computer Applications
2. Computer Applications to Design Processes
3. A typical user interface, view controls, and modeling structures
4. Hands-on for Computer object generation
4. Visualization, revolved protrusion, mirror copies, rounds, and chamfers
5. Other modeling utilities
6. Datums points and sketch drawing tools
7. Patterning and database reproduction/distribution
8. Formal engineering drawings
9. Assembly fundamentals
10. Assembly operations
11. Sweeps and blends, (fine detailing)
12. Wireframe modeling
13. Surface definition/effects/concerns
14. More on surface models
15. Three Dimension Aspects of Solid Modeling

Instructional Methods:

1. The instructor will present the materials through the use of lectures, visual aids, illustrations, and computer demonstrations. The overall responsibility for learning rests upon each student.
2. Attendance - Each student will be responsible for all class sessions. Absences from tests and other academic work may not be made up unless previous arrangements have been made with the instructor. Makeups, if any, will be based on proven valid reasons.

3. All assignments must be completed by the assigned deadline date. The assignments and deadline dates will be provided by the instructor.

Evaluation and Grading Policy:

1. Attendance: 5%. Attendance and active participation in class are required. Each student will be responsible for all class sessions. Absences from exams and other academic work may not be made up unless previous arrangements have been made with the instructor. Makeup exams, if any, will be based on proven valid reasons. Students are required to attend and sign the attendance sheet every class.
2. Labs: 55%. Labs count for 55% of the final grade. Homework is due at the beginning of the class meeting after it is assigned. Late homework will not be accepted. In particular, homework turned in after the official last day of classes will not be considered for grading. Homework is the student's scholastic work. Cheating and or plagiarism is unethical conduct. Students demonstrating such behavior will be subject to severe university disciplinary sanction if such behavior is demonstrated.
3. Two Exams: 40%. Two exams of equal weight count for 40% of the final grade. No makeup exams will be given except under extreme circumstances and by proven valid reasons.
4. Grade Scale: A: 90-100 B: 80-89 C: 70-79 D: 60-69 F: Below 60
5. Honesty is expected in all work. Any indication of dishonesty will prove fatal with F grade in the final grade of the course.

Makeup: No makeup exams/Labs allowed for unexcused absences. For health related absences, on provision of the medical excuse, a makeup exam may be arranged at the discretion of the instructor and with an Official University Excuse.

STYLES OF LEARNING AND TEACHING: We all have different strengths and weaknesses as learners, as well as habitual or preferred ways of receiving and processing information. Your instructors may also be accustomed to approaching specific subjects or materials in certain ways. Our objective is always to inform and stimulate, as well, to encourage independent learning. Please feel free to talk with me at any time during the semester concerning ways in which I might help you to address your individual learning needs. Students with disabilities are encouraged to meet with me early in the semester to discuss accommodations.