MAE 3
Introduction to Engineering Graphics and Design (4 units)

Class/Laboratory Schedule: four hours of lecture, two hours of lab, six hours outside preparation. 12 hours/week total

Course Coordinator(s): Nathan Delson

Textbooks/Materials:
1. Soft-reserves Course-pack with chapters covers:
- The Design Process,
- CAD
- Teamwork

2. On-Line Tutorials covering:
- Mechanical Components
- Application of Energy Analysis to Machine and Mechanism Design
- Rapid Prototyping Use in the Design Studio

Catalog Description:
Introduction to design process through hands-on individual and team projects. Topics include 2D/3D CAD (drawing projections/isometrics, dimensioning), design problem identification, prototype fabrication techniques (shop skills, rapid prototyping), design process (concept generation/selection, risk reduction strategies, scheduling), learning from hardware performance (problem solving/redesign), teamwork. Use of components: fasteners, couplings, DC motors, oral/written communication with graphics. Program or materials fees may apply.

Prerequisites: Grade of C- or better in Physics 2A or 4A. Enrollment restricted to BE 25, MC 25, MC 27, MC 29, and MC 30–37 majors only.

Course Type: Required

Course Objectives:

Objective 1: To teach students the basic principles of engineering graphics and CAD tools .

Objective 2: To train students to identify design problems, and design a system to meet desired needs.

Objective 3: To train students in graphical, written, and oral communication

Objective 4: To introduce students to the design process through hands-on experience

Objective 5: An ability to function on teams

Objective 6: To introduce students to basic machine design

Course Topics:

1. Drawing Projections
2. Drawing Isometrics
3. Dimensioning
4. 2D and 3D CAD
5. Design Problem Identification
6. Prototype Fabrication Techniques (light duty shop skills and rapid prototyping)
7. Design Process (concept generation and creativity, concept selection, risk reduction strategies, and scheduling)
8. Learning from hardware performance (problem solving and redesign)
9. Teamwork
10. Detail Design Techniques (use of fasteners, couplings, and DC motors)
11. Graphical and written communication

Last Updated: March 2025