

ME/CEE 1770 Introduction to Engineering Graphics and Visualization (Required)

Catalog Description: ME/CEE 1770 Introduction to Engineering Graphics and Visualization (2-3-3)
Crosslisted with AE, CEE, and ME.
Prerequisites/Corequisites: None
Introduction to engineering graphics and visualization including sketching, line drawing, and solid modeling. Development and interpretation of drawings and specifications for product realization.

Textbook: Dennis K. Lieu and Sheryl Sorby, *Visualization, Modeling, and Graphics for Engineering Design*, 1st Edition, Delmar, Cengage Learning, 2009.

Topics Covered:

1. Introduction: need for spatial representation and visualization.
2. Drawing projections: multiview orthographic, isometric, etc.
3. Three dimensional representations and model construction processes.
4. Graphic and written requirements for product realization.

Course Outcomes:

Outcome 1: Students gain familiarity with the elements of 3D visualization and good sketching technique.

- 1.1 Students are able to prepare elementary sketches of 3D objects with correct interpretation of 3D geometry and topology and comprehend a sketch.

Outcome 2: Students gain familiarity with the basic structure and content of engineering drawings.

- 2.1 Students are able to sketch and use 2-D computer-aided design software to draw multiview orthographic and other projections including isometric, auxiliary, and sectional views, and are able to properly provide dimensions and tolerances and common drawing notation to a drawing.

Outcome 3: Students get hands-on experience with solid modeling and visualization.

- 3.1 Students are able to generate 3-D parametric, feature-based solid models and generate two dimensional views from these three dimensional solids.
- 3.2 Students are able to generate assembly models and use rendering techniques and create simulations and animations of the moving parts of an assembly.

Outcome 4: Students are exposed to the visual, written, and team work requirements associated with engineering product realization.

- 4.1 Students understand requirements for complete product specifications (e.g., drawings and technical specifications) and can read, understand, and interpret drawings (e.g., assembly, articulation, quantity take-offs).
- 4.2 Students are able to work in a team project and understand the importance of communication, scheduling, and attainment of project goals.

Correlation between Course Outcomes and Student Outcomes:

ME/CEE 1770											
	Mechanical Engineering Student Outcomes										
Course Outcomes	a	b	c	d	e	f	g	h	i	j	k
Course Outcome 1.1											X
Course Outcome 2.1					X						X
Course Outcome 3.1											X
Course Outcome 3.2											X
Course Outcome 4.1					X						X
Course Outcome 4.2				X			X				X

GWV School of Mechanical Engineering Student Outcomes:

- (a) an ability to apply knowledge of mathematics, science and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

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