

ENGR 6: ENGINEERING GRAPHICS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2024
Units:	4
Hours:	3 lecture, 3 laboratory per week (72 total per quarter)
Prerequisite:	MATH 48C or equivalent.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU/UC
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Description

The application of orthographic projection to detail and assembly drawings, with examples from various engineering fields. Geometric construction, sketching, dimensioning for interchangeable assembly and specification of materials. Graphical analysis, documentation, and presentation of engineering information. Theory of orthographic projection and its application to graphical solution of the more advanced three-dimensional space problems. Investigation of relationships between points, lines, planes, and solids. Use of solid modeling computer program in carrying out the above course components.

Course Objectives

The student will be able to:

1. Visualize three-dimensional objects in space, and present these objects on a drawing by orthographic and pictorial methods of projection.
2. Execute a simple set of working drawings as used in industry and construction; the student will have, in some degree, an appreciation of the engineering design considerations involved in the production parts represented in his drawings.
3. Use current dimensioning techniques as represented in such publications as ANSI.
4. Develop professional standards for the neat and orderly presentation of graphic information.
5. Use computer to construct working drawings and drawings that are related to descriptive geometry, as well as introduction level of 3-D molding.

Course Content

1. Three-dimensional visualizations
 - a. Orthographic projection
 - i. Isometric projection
 - ii. Dimetric and trimetric projections
 - iii. Multiview projections
 - b. Oblique projections

- i. Cabinet projection
 - ii. Cavalier projection
- c. Perspective drawings
2. Engineering design considerations
 - a. Fabrication methods
 - b. Tolerances
 - c. Design analysis
 3. Dimensioning
 - a. Standards
 - b. Conventions
 4. Graphical communication conventions
 - a. Part and assembly drawings
 - b. Bill of materials
 5. Computer-aided design
 - a. Constraints
 - b. Chamfers
 - c. Rounds
 - d. Fillets
 - e. Holes
 - f. Sweeps

Lab Content

1. Sketching different projections using paper and pencil
2. Creating three-dimensional CAD models that include constraints
3. Applying design and manufacturing standards and constraints to CAD models
4. Creating rapid prototypes of CAD models

Special Facilities and/or Equipment

Classroom equipped with computer/drafting software, projection system and screen, and 3-D fabrication capabilities.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Drawing assignments, both by hand and computer
 Quizzes
 Midterm and final examinations
 Group projects

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
 Hands-on lab/lecture
 Demonstration
 Group project

Representative Text(s) and Other Materials

Bertoline, Wiebe, Ross, and Hartman. Fundamentals of Solid Modeling and Graphic Communication. 2018.

This is the most recent edition of this text.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Homework problems covering subject matter from text and related material. Students will need to employ critical thinking in order to complete assignments
2. Students will have hands-on activities in class and discuss their assignment and check their understanding of lecture material. Reading and understanding handout manual prior to class is critical to their success
3. Students design and build their project. At end of the quarter, students will present their projects in both the form of a written report and oral presentation

Discipline(s)

Engineering