E 28: Basic Engineering Design Graphics (3 units)

Required Course

Syllabus

CATALOG DESCRIPTION


COURSE PREREQUISITES

None.

TEXTBOOK(S) AND/OR OTHER REQUIRED MATERIAL

- High school level college preparatory math and geometry.

COURSE OBJECTIVES

Improve 3-dimensional visualization skills; enable a student to create and understand engineering drawings; introduce computer-aided geometry modeling as a visualization, design and analysis tool; introduce geometric tolerance analysis for fabrication of parts and assemblies.

DESIRED COURSE OUTCOMES

Upon completion of the course, students shall be able to:
Understand and create engineering drawings; visualize 3-dimensional geometry from a series of 2-dimensional drawings; perform 3-dimensional graphical analysis of geometry problems; operate 2-dimensional CAD and 3-dimensional solid modeling software tools with confidence; specify dimensions and tolerances for parts and assemblies such that they can be fabricated, and fit such that they function with the desired result.
TOPICS COVERED

History and role of graphics in engineering; 3-D visualization; introduction to basic fabrication processes; introduction to bolting, welding and riveting; practices used in engineering drawing; structural drawings; orthogonal projection; auxiliary, section, and detail views; basic descriptive geometry; land contours and profiles; cut-and-fill problems; solid modeling; parametric design; assembly modeling; geometric dimensioning and tolerancing.

CLASS/LABORATORY SCHEDULE

Two hours of lecture and three hours of laboratory per week.

CONTRIBUTION OF THE COURSE TO MEETING THE PROFESSIONAL COMPONENT

Students learn graphical analysis and design techniques using the hardware and software tools used by engineers in the field. Economic, manufacturing, and fabrication issues are considered throughout the course as they apply to the topics addressed. Students are introduced to the concept of working in a group through the semester-long design project. As part of this project, students are required to communicate orally and graphically, and make presentations to the class and instructors.

RELATIONSHIP OF THE COURSE TO ABET PROGRAM OUTCOMES

(a) an ability to apply knowledge of mathematics, science, and engineering
(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
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

ASSESSMENT OF STUDENT PROGRESS TOWARD COURSE OBJECTIVES

- Homework assignments on a weekly basis.
- 2 Midterm examinations.
- Final examination.
- Semester design project

PERSON(S) WHO PREPARED THIS DESCRIPTION: D. K. Lieu

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ABBREVIATED TRANSCRIPT TITLE (19 SPACES MAXIMUM): Basic Engr Des Grp
TIE CODE: LABS
GRADING: Letter
SEMESTER OFFERED: Fall and Spring
COURSES THAT WILL RESTRICT CREDIT: NONE
INSTRUCTORS: Professor Dennis Lieu
DURATION OF COURSE: 15 Weeks
EST. TOTAL NUMBER OF REQUIRED HRS OF STUDENT WORK PER WEEK: 9
IS COURSE REPEATABLE FOR CREDIT? No
CROSSLIST: None