MECH 140: Introduction to Engineering Design

Catalog description: 3.0 units
An introduction to the art and science of engineering design. Techniques for encouraging creativity in design. Use of a computer to control devices. Projects requiring design, construction, and testing of devices, including a computer-controlled electromechanical system. 2.0 hours discussion, 2.0 hours activity. Special fee required; see The Class Schedule.

Prerequisites: none

Course objectives: For students to
1. Be motivated to continue study of engineering
2. Learn a process for designing mechanical systems
3. Be given opportunities to increase their creativity
4. Learn how to be effective members of a team
5. Be introduced to the concept of using a computer to control an electro-mechanical system
6. Improve their oral, written, and graphical communication skills

Course outcomes: Students shall be able to
1. Write an adequate design problem statement
2. Solve a design problem in a rational, systematic manner
3. Write a simple computer program to control several power supplies

Topics covered
1. A paradigm for designing mechanical systems
2. Need finding
3. Writing problem statements
4. Techniques to promote creative thought
5. Anticipation of failure modes
6. The importance of testing
7. Requirements for effective human communication
8. Introduction to creation of working drawings
9. Writing a simple QuickBASIC computer program to control several programmable power supplies

Class/Laboratory schedule
Two hundred minutes of activity per week

Contribution of course to meet the professional component
This course contributes to the students’ ability to work professionally in the mechanical systems area.

Relationship of course to Mechanical Engineering Program Outcomes
This course contributes principally to Program Outcomes C, D, E, and F.