Credits: 3 hours lecture, 0 hours laboratory per week

Instructor: Jae Joong Ryu, Assistant Professor of Mechanical Engineering

Text(s): Pro|ENGINEER® WILDFIRE™ 5.0: Tutorial and MultiMedia CD, SDC Publications, 2009
Additional Material: Computer Laboratory Manual
Mastering CAD/CAM by I. Zeid, McGraw Hill, 2005
Pro/Engineer® Wildfire™ 5.0 by Louis Gary Lamit, Cengage Learning, 2011
Software: Pro/Engineer® Wildfire™ 5.0 Student Edition

Course Information

Catalog Description: This course covers topics in object representation, geometric transformations, solid modeling, feature-based modeling, computer numerical control, kinematic modeling, and machining simulation.

Prerequisites: Consent of the Instructor

Required, Elective, Selected: Elective

Course Goals

Instructional Outcomes: By the end of this course students will be able to:
1. Demonstrate an understanding of technical drawing and engineering communication
2. Demonstrate an utilization of Algebraic notions to characterize geometric representation
3. Demonstrate an understanding of the basic concepts of geometric modeling and computer graphics
4. Demonstrate their ability to design and analyze practical engineering problems using geometric modeling and computer graphics.
5. Demonstrate geometric transformation related to manipulations of objects’ images
6. Demonstrate the area of solid and feature-based modeling
7. Demonstrate principles of parts assembly modeling and constraints
8. Demonstrate their expertise in the use of commercial CAD packages in practical engineering applications

Relationship to Student Outcomes: This course supports the following Mechanical Engineering Program Student Outcomes, which state that our students will:
1. be able to apply science, mathematics, and modern engineering tools and techniques to identify, formulate, and solve engineering problems
2. be able to apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic, and social issues

**Topics Covered**

1. Fundamentals of graphics programing, geometric modeling, and parametric representations of lines and curves
2. Introduction to Pro/Engineer User interface: view and display, model manipulations, model tree, dashboard
3. Sketching a solid model, drafting and engineering drawing
4. Datum planes, axes and layers
5. Direct modeling: round, shell, hole, mirror, chamfer
6. Extrusion command
7. Assembly: geometric constraints, placing components, copy, reference view
8. Patterns: fill, axial, directional patterns
9. Blends: Cartesian grid, polar grid, shell tool, sections
10. Sweep: options, trajectory, sections
11. Helical sweeps: multi-plane sweeps for hooked-end spring design

Prepared By: Jae Joong Ryu Date: 01/03/2014