Agenda Item #03-22, Effective Spring 2004
Effective Fall 2010, with revisions

Eastern Illinois University
New Course Proposal
AET 2043, Computer-Aided Engineering Drawing

1. Catalog Description
   a. Course number: AET 2043
   b. Title: Computer-Aided Engineering Drawing
   c. Credit: 1-4-3
   d. Terms to be offered: F,S
   e. Short title: CAD Engr Drawing
   f. Course description: Sketching, spatial visualization, computer-aided drawing (CAD) procedures, multiview drawing, dimensioning, tolerancing, threads and fasteners, and descriptive geometry.
   g. Prerequisites: AET 1012 or permission of instructor.
   h. Initial term of course offering: Spring 2004

2. Objectives and Evaluation of the Course
   a. Objectives of the Course:
      After completion of the course, the student will be able to:
      1. perform fundamental operations in the use of a CAD system.
      2. understand orthographic projection principles and concepts.
      3. visualize a solid object given the orthographic views of an object and vice versa.
      4. technical sketch according to established principles.
      5. identify and apply drafting standards and conventions to dimensioning, tolerancing, sectioning, and threads and fasteners.
      6. perform descriptive geometry according to established principles.
      7. complete advanced courses in CAD
   b. Methods of assessing students' achievement of the course objectives:

Thirteen drawing problem assignments to be completed in the laboratory:	40%
Three tests at approximately four-week intervals	40%
Final examination	20%

   c. This is not a technology-delivered course.
   d. This course is not numbered 4750-4999
   e. This course is not designated writing-intensive

3. Outline of the Course
   a. The units of time for each major topic on the outline:

	Week
Introduction	
Getting Started with CAD	1
o Loading and manipulating toolbars	
o Accessing tools	
o Naming a drawing	
o Specifying drawing units and limits	
o Using the grid and snap features	
o Saving a drawing	
o Exiting a drawing	

Fundamentals of 2-D CAD 2 & 3
- Drawing basic shapes
- Editing objects
- Understanding coordinate systems

Advanced CAD concepts 4 & 5
- Drawing with object snaps
- Editing with grips

Technical Sketching 6
- Line sketching
- Arc sketching
- Object sketching
- Maintaining proportion
- Multiview sketching
- Pictorial sketching

Orthographic Drawing and Spatial Visualization Procedures 7,8 & 9
- Drawing principal views
- Drawing auxiliary views
- Visualizing 3-D objects from multiview drawings
- Creating multiview drawings

Sketching 10
- Sectioning standards and conventions
- Creating full and half sections
- Creating special types of sections

Dimensioning 11
- Dimensioning standards and conventions
- Creating a dimension style
- Dimensioning square shapes
- Dimensioning curved shapes
- Creating notes

Tolerancing 12
- Understanding plus/minus and limit tolerancing
- Creating plus/minus and limit tolerances

Threads and Fasteners 13
- Understanding thread standards
- Creating thread notes

Fundamentals of Descriptive Geometry 14
- Finding true lengths of lines graphically
- Finding true shapes of planes
- Determining the true relationships between lines
- Determining the true relationships between lines and planes

Introduction to 3-D Drawing 15
- Creating basic solid shapes
- Solid modeling and UCS
- Combining solid models

b. This is not a technology-delivered course

4. Rationale
   a. The purpose for AET 2043 is to ensure that students enrolled in the Applied Engineering & Technology Program receive sufficient computer-aided drawing (CAD) experience. Currently the only required drawing course is AET 1043, Engineering Graphics, which includes only a brief introduction to CAD. AET 3053, Industrial CAD, is currently an elective course. AET 2043 would be a required course (replacing AET 1043) and would provide students with basic, as well as advanced, CAD experience along with presenting engineering graphics principles, standards and concepts.
   b. The level of the course is justifiable since the content will contain in-depth computer-aided drawing experience and also build upon the knowledge and experience gained in technical drawing.
   c. Similarity to existing courses:
      1. There would be no similarities to existing courses.
      2. AET 1043, Engineering Graphics, and AET 3053, Industrial CAD, would be deleted.
   d. Impact on program:
      1. This course would be a required course for the undergraduate Applied Engineering & Technology Program, General and Manufacturing Options.

5. Implementation
   a. Faculty member to whom the course may be assigned:
      Ron Sutliff and Wafeek Wahby
   b. Additional cost to student: None
   c. Texts:
      Bethune, James D. (2002). Engineering Graphics with AutoCAD 2002. Englewood Cliffs, NJ: Prentice Hall.

      Sorby, James A., Manner, Kim J. & Boaartmans (1998). 3-D Visualization for Engineering Graphics. Englewood Cliffs, NJ: Prentice Hall.

6. Community College Transfer
   A community college course may be judged equivalent to this course.

7. Date approved by the department or school: December 5, 2002

8. Date approved by the college curriculum committee: February 12, 2003

9. Date approved by CAA: February 27, 2003