1. **Course title:**
   Engineering Graphics and Design I

2. **Prerequisite:**
   Exit or exemption from all Learning Support or ESL requirements except ENSL 0091
   MATH 1111 with a grade of “C” or better

3. **Textbook:**
      Faculty Y. D. Kim, A. Honkan and V. Bennett (McGraw-Hill)*
   2. Tutorial Guide to AutoCAD 2014, Shawna Lockhart, SDC publications

4. **Catalog Description:**
   An introduction to engineering graphics and design, this is the first of a two-course sequence,
   offering hands-on instruction in the use of an industry-leading computer-aided design software system
   to produce two-dimensional drawings. Topics include the fundamentals of engineering graphics and
   design, geometric construction, the engineering design process, and drawing composition with emphasis
   on industry practice.

5. **Course objective:**
   As a result of completing this course, the student will be able to do the following:
   - Explain the advantages of computer-aided design/drafting (CAD).
   - Use the menu structure and data input conventions to create, view, edit, and plot
     engineering drawings.
   - Use the basic two-dimensional entity draw commands.
   - Use the basic two-dimensional edit and inquiry commands.
   - Use the basic display controls needed for viewing two-dimensional drawings.
   - Use layers and other supplied drawing aids.
   - Use the basic dimensioning commands.
   - Print, plot, and present engineering designs using CAD software.
   - Read and create working mechanical, architectural, schematic, and manufacturing
     drawings.
   - Use and understand the concepts of orthographic projection.
   - Understand the engineering design process and identify basic industry practice.
6. General notes:

a. Students should be assigned substantial number of practice exercises in class/home assignment to achieve competency in the use of commands to create and edit two-dimensional drawings. Additional resources are available on the WEB e.g. www.mhhe.com/leach

b. A project in the area of student’s choice or as decided by the instructor that employs at least 80-90% of all the commands of the software that were covered in the course should be assigned. The instructor must ensure the project selected by a student can be completed within reasonable period of about three class sessions.

c. The evaluation procedure is mandatory for the grade for credit students and optional for non-credit students.

7. Course Outline:

Chapter 2: The engineering design process
Kinds of design, design methodologies, focus on how CAD is used in PDM/PLM systems. 1 week.

Chapter 3: Design in industry. The design process
Focus on how CAD is used in the design process. Assign the case study as a reading assignment. Assign one of the design problems at the end of the chapter, or another similar type of problem. 1 week.

Chapter 6: Technical Drawing Tools
Cover Sec. 6.5 only.
Assign Exercises 1, 2, 9 (title blocks and borders), 5-8 (scales), and selections from 12-26 (CAD implementations of 2-D geometry). 4½ weeks, including CAD instruction

Chapter 10: Multi-view Drawings
Cover all sections. In the discussion of line types, line precedence, and intersections of lines, refers to Sec. 7.8.
Assign Exercises 1, 2, 4 (selections from 1-36), 5 (selections from 1-24), 6 (selections from 1-36), 7 (selections from 10.95 – 10.154), 8-9. Implement these exercises in CAD, not by hand. Also creating missing 2-d views and isometric views from multi-views are optional. 3 weeks, including CAD instruction

Chapter 11: Axonometric and Oblique Drawings
Cover all sections, but place most emphasis on 11.2 (isometric drawings). Assign Exercises 1 (selections from 1-69) and 5. 2 weeks, including CAD instruction

Chapter 17: Dimensioning and Tolerancing
Cover Sec. 17.1-4. Assign selections from Exercises 1-20 (create a dimensioned multi-view). 2 weeks, including CAD instruction

Chapter 20: Cover Sec. 20.1-2. Assign selections from Exercises 1-24 (create a set of drawings). 1½ weeks, including CAD instruction

***please see teaching guide for textbook #2 on CAD
It is recommended that students take this and or ENGR1603 course before they register for any other engineering course in engineering program.

8. Evaluation:

The emphasis should be on measuring the level of expertise achieved in applying the software commands to successfully reproduce 2-dimensional drawings. The details of grade determination are flexible however one recommended procedure would be to weigh the four components as follows:

The course grade is to be determined by the individual instructor by a variety of evaluation techniques consistent with the overall college policy including the class attendance. The procedure should include:
• At least three in-class assessments (tests or quizzes) -30%
• Two projects -30%
• Classwork and homework - 10%-15%
• Comprehensive final examination - 25% to 30%.

Projects should be structured in such a way that a summary of the material covered during the semester can be demonstrated. Students, with the approval from the instructor, should select their own final drawing projects. The instructor must ensure that the project approved employs 80% to 90% of all commands of the software covered in the course.

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