E 28 – Basic Engineering Design Graphics, Fall Semester 2012

Instructor: Prof. D.K. Lieu (dlieu@me.berkeley.edu)
5128 Etcheverry Hall, 642-4014
Office Hours: MW 10 – 12

Description:

Introduction to engineering design graphics. 3-dimensional visualization and spatial reasoning. Engineering sketching. Review of basic fabrication processes. The fundamentals of orthographic projection, with applications. Parametric and feature-based solid modeling. Assembly modeling. Geometric dimensioning and tolerancing. Drawing conventions and presentation of 3-dimensional geometry on 2-dimensional media. This course will introduce and emphasize the use of CAD on the computer workstation as the major graphical analysis and design tool. A design project is required. 3 units.

Lectures: MW 9-10, 105 Northgate Hall
Exam Group 16: Thursday, 13 December 2012, 7 -10 PM

Laboratory: Sections 101 and 102: W 3-6, 2105/2107 Etcheverry Hall
Sections 103 and 104: Th 3-6, 2105/2107 Etcheverry Hall
Sections 105 and 106: Fr 3-6, 2105/2107 Etcheverry Hall

Head GSI: Daniel Talancon
GSI's: TBA
GSI Office Hours: TBA

Course Material Fee: There is a $27 course material fee for this class.

Textbooks:

Lieu, D.K., and Sorby, S.A., Visualization, Modeling, and Graphics for Engineering Design, Cengage Publishers, 2008. ***Required.***

Planchard, M.P., Planchard, D.C., Engineering Design with Solidworks, SDC Publications, 2011. ***Recommended***

A variety of good manuals on AutoCAD and Solidworks are available from the many bookstores around campus, and may be used as reference material for those with little or no CAD experience.

You do not need a "clicker" for this class.

Organization:

14 weeks of lecture. Open laboratories. Weekly homework assignments. One group design project. The midterm examinations are scheduled for the evening (7:00 – 8:00 PM) of Friday, 28 September, and the evening (7:00 – 9:00 PM) of Friday, 2 November. The Final Exam will be held on Thursday, 13 December 2012, 7 -10 PM. Availability for lectures, laboratories, and all examinations is required for enrollment in the class.

Homework will be assigned in lecture on Mondays and will be due on Wednesdays the following week. Completed homework sets are to be submitted before 3:00 PM in the labeled boxes located on the south wall of the 3rd floor of Etcheverry Hall.

Laboratory:

The purpose of the laboratory sections is to provide a forum where students can receive assistance with lecture and homework material from the instructors and other students. At the beginning of each lab session, the GSI will usually present a short review of the week's lecture material, and provide useful hints for CAD work.

The labs are locked after 6:00 PM and on the weekends and the building is locked at 7:00 PM and on weekends; however, students enrolled in the class can obtain card key activation to access the labs and the building after hours with the proximity card key feature of their student ID. Card key activation may be obtained from https://www.me.berkeley.edu/accounttool/ for a $10 activation fee (through CARS) if you are an ME student. Otherwise you can get card key access with $10 check or money order to UC Regents, from room 6161 Etcheverry during key hours (9 AM to 11 AM Tu-Fri).

The CAD workstations in rooms 2105 and 2107 Etcheverry Hall are provided for student use in this, and other, courses, except when a class is in session. The 30 student stations in each laboratory (60 stations total) are networked to a printer and a fileserver, where personal files (up to 200 Mb) may be stored. Each student can use their CalNet ID (student ID) and their passphrase to logon to the computers Only students who are on the official class list AND have their card key activated will be allowed to login. There will be a grace period of 3 weeks from the start of the semester before students without cardkeys activation will be denied access. Sometimes actual activation gets delayed, but as long as you have signed up for activation your computer account will remain active. Each student should obtain a USB drive for file transfer and back-up. Most homework assignments will require the use of a computer. It is recommended that students use their own computers and software for doing their homework and project outside the laboratory. The software used for this course is AutoCAD and Solidworks. Instructions for downloading the software, at no cost, will be given during Lab.

If problems are encountered with a machine, place a note under the keyboard describing the problem, and move to another machine; otherwise the instructors have no way of knowing that a machine is down. Keep the room secure; do not allow unauthorized access. Please notify the instructors or campus security of any suspicious persons or events in, or near, the Labs. Theft of computer equipment and personal property has been a problem in the Labs in the past. DO NOT BLOCK OPEN THE DOORS.
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Scoring: 20% Homework
20% Project
10% Midterm Examination #1 (2 hr.)
20% Midterm Examination #2 (3 hrs.)
30% Final Examination (3 hrs.)

Week	Dates	Material	Reading, Material Review
2	8/27, 8/29	Course Introduction History of Graphics Sketching and CAD, Pictorials	Lieu and Sorby, Chapter 1, 2 Supp Chapter 2
3	9/5*	Visualization, Skill Assessment, Coded Plans	Lieu and Sorby, Chapter 3
4	9/10, 9/12	Image Rotation, Reflection, Cutting Standard Fabrication Processes	Lieu and Sorby, Chapter 3 Lieu and Sorby, Chapter 9
5	9/17, 9/19	More Fabrication Processes Building with Standard Fabrication Processes	Lieu and Sorby, Chapter 9
6	9/24, 9/26 9/28	Bolting, Riveting, Welding. Orthographic Projection, Standard Views 7 – 8 PM, Midterm Examination #1	Lieu and Sorby, Chapter 17 Lieu and Sorby, Chapter 10
7	10/1, 10/3	Auxiliary Views, Sections Views Basic Descriptive Geometry, Semester Project	Lieu and Sorby, Chapters 13, 14 Lieu and Sorby Supp Chapter 5
8	10/8, 10/10	Problems Solving with Descriptive Geometry Solid Modeling. 2D Sketching and Constraints Project Sketches due	Lieu and Sorby Supp Chapter 5 Lieu and Sorby, Chapter 6
9	10/15, 10/17	Extrusions and Rotations. Boolean Operations Feature-Based Design, Design History Tree	Lieu and Sorby, Chapter 6
10	10/22, 10/24	Parametric Design and Use of Equations Design Tables	Lieu and Sorby, Chapter 6
11	10/29, 10/31 11/2	Sweeps and Lofts Assembly Modeling 7 – 9 PM, Midterm Examination #2	Lieu and Sorby, Chapter 6 Lieu and Sorby, Chapter 7
12	11/5, 11/7	Dimensions and Tolerances, Datums Surface and Feature Control Specifications Project Reviews	Lieu and Sorby, 15 Lieu and Sorby, Chapter 16
13	11/14*	True Position and MMC	Lieu and Sorby, Chapter 16
14	11/19, 11/21	Working Drawings Extracting Working Drawings	Lieu and Sorby, Chapter 18
15	11/26, 11/28	Structural Drawings	Class Notes

Project drawings are due Monday, 3 December, 5:00 PM. Final Exam on Thursday, 13 December 2012, 7 -10 PM

* Notes: 3 September is an academic holiday. No classes
12 November is an academic holiday. No classes.
22-23 November is the Thanksgiving holiday. No classes