ME 20/Tech20    Design & Graphics    Spring 2014

Faculty: Prof. Ken Youssefi, (Course Coordinator) Email: kyoussefi@aol.com
Office: E-137
Office hours: MW 10-11 or by appointment

Final Exam: Friday, May 16, 8:30-9:30 (design project presentation)

Lab. and Teaching Assistants: Robert Aguayo robertaguayo@gmail.com, Dan Pham mlm2x3@yahoo.com, Thien Van thienvan@berkeley.edu, Brian Krupp krupp.brian@yahoo.com, Gabriel Avila gavila4@gmail.com

Course Website: www.engr.sjsu.edu/youssefi, course syllabus, lecture notes, project description, lab. assignments, homework solutions are posted

Class time: Lecture Monday 9:00 – 9:50 (section 1, 26683), E-189, Youssefi
Labs.
Tuesday 9:00 – 11:45 (section 2, 26684), E-407, Instructor: Robert
Wed. 1:30 – 4:15 (section 3, 26685), E-407, Instructor: Thien
Thursday 1:30 – 4:15 (section 4, 26686), E-407, Instructor: Brian
Monday 10:00 – 12:45 (section 5, 26691), E-407, Instructor: Dan
Monday 1:30 – 4:15 (section 6, 30089), E-407, Instructor: Gabriel

Course Description
Introduction to graphical communication tools used by engineers. Orthographic projections, section and axillary views and dimensioning standards. Development of visualization and technical sketching skills in conjunction with orthographic and pictorial projections. Tolerance analysis for fabrication. Focus on solid modeling using computer-aided-design (CAD) software. Individual design project focusing on the design phases (concurrent engineering design).

“Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of forty-five hours over the length of the course (normally 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practical. Other course structures will have equivalent workload expectations as described in the syllabus.”

Prerequisites: E10

Custom edition for SJSU (soft cover)

Recommended Text: AutoCAD tutorial (2008), Creo 2.0 tutorial
You may download a free copy of AutoCAD 2013/14 from Autodesk.com, and a copy of Creo 2.0 from PTC.com site

Design Project: refer to the separate handout

Homework: homework problems will be assigned a week before the due date. Homework is due after the lecture. Late homework, will not be accepted.

Attendance: attendance in all lectures and labs is strongly recommended, absence will affect your grade.
Laboratory assignments: Lab work will include 2D drawing (orthographic projections) and solid modeling of an object using Creo 2.0. Lab work assigned has to be finished during the lab period, unless specified otherwise by the lab instructors. No late assignments will be accepted. Lab period will also be used for the design project.

Department Policy on Computer Lab Use: Use of the department and college computer labs is a privilege that can be lost by abuse. The following are grounds for loss of lab privileges:

- Unauthorized copying of software, either from the computer, or using the computer.
- Installation of any software, media, or files that are not specifically required to do your class activities. You may not install messenger, music, gaming, or any other software program on computers in the lab.
- Abuse of computers or hacking or modifying the operating system, user interface, or desktop in any way.

Loss of your computer lab privileges would mean that it will be up to you to arrange to meet your lab requirements outside of the campus computer labs.

Grading: Lab. Assignments & Homework 20%, Exams 60% (3D modeling 25%, written 20%, AutoCAD 15%), Project 20%

Final course grade is determined using a normal distribution curve. The average is given a grade Of C+. Grade distribution:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>Grade A</td>
<td>Average plus one standard deviation and higher</td>
</tr>
<tr>
<td>Grade B</td>
<td>Average plus ½ standard deviation</td>
</tr>
<tr>
<td>Grade C-</td>
<td>Average minus ½ standard deviation</td>
</tr>
<tr>
<td>Grade F</td>
<td>Average minus one standard deviation and lower</td>
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Academic Integrity: Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University’s Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Judicial Affairs. All students should review the Academic Integrity Policy on cheating and plagiarism, copy of the policy can be found on the website at [http://www2.sjsu.edu/senate/s04-12.pdf](http://www2.sjsu.edu/senate/s04-12.pdf). The guidelines on collaboration for this class, and the consequence of cheating and plagiarism will be discussed in the class.

Campus policy in compliance with the Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability.

Course Goals

The course goals are:

- To help students visualize three dimensional objects.
- To introduce students to technical freehand sketching (pictorials).
- To introduced students to the principal of orthographic projections.
- To introduce students to technical drawings; shop, assembly, and exploded.
- To introduce students to proper dimensioning and tolerancing.
- To introduce students to computer-aided design tools, 2D and 3D (solid modeling).
- To introduce the students to engineering design process through a design project and lab. work.

Student Learning Objectives

The students should be able to:

- Freehand sketch a 3D view of an object (isometric, oblique and perspective).
- Draw the standard two dimensional views (top, front and profile) of an object.
- Draw section and auxiliary views
- Properly dimension standard views for fabrication.
- Apply the proper tolerances to parts.
- Draw complicated two dimensional views of an object using AutoCAD.
- Make 3D solid model using CAD software.
- Understand the engineering design process and the implementation of different design phases.
<table>
<thead>
<tr>
<th>Week/Date (Mon.)</th>
<th>Subject</th>
<th>Reading Assign. (Ch., 6th ed.)</th>
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<tbody>
<tr>
<td>1 1/23</td>
<td>Lab. -</td>
<td>No lab on Thursday</td>
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</table>
| 2 1/27           | Lect. - | Introduction and course organization  
|                  |         | Orthographic projection and standard 2D views  
|                  |         | (1, 5)  
|                  | Lab. -  | AutoCAD; Intro to the CAD lab. and AutoCAD Tutorial (lab. work #1) |
| 3 2/3            | Lect. - | Orthographic projection continue  
|                  |         | Auxiliary views; classifications and applications  
|                  |         | Section views; full, half and broken, conventions  
|                  | Lab. -  | AutoCAD; Lab. work #2 (multiviews) |
| 4 2/10           | Lect. - | Dimensioning and Tolerancing (size and GDT); rules and standards  
|                  | Lab. -  | AutoCAD; Lab. work #3 (dimensioning and tolerancing)  
|                  |         | HW 1 due during lect.  
|                  |         | Product list due (turn in your list to the lab. instructor) |
| 5 2/17           | Lect. - | Pictorials; Isometric, oblique and perspective  
| Lab. -           | Exam 1, all sections, AutoCAD exam, during lab. period | HW 2 due during lect. |
| 6 2/24           | Lect. - | Freehand sketching techniques, spatial visualization, exam review  
| Lab. -           | Solid Modeling (Creo 2.0);  
|                  |         | Lab. work #4 (sketching, extrusion) |
| 7 3/3            | Lect. - | Formal engineering drawing and practices, shop drawings, assembly and exploded views  
| Lab. -           | Solid Modeling, Lab. work #5 (3D modeling, 2D shop drawings and revolve) |
| 8 3/10           | Lect. - | Exam 2 (one hour) – Section 1, Monday 3/10, during the lecture period  
| Lab. -           | Solid Modeling; Lab. work #6, solid modeling, sweeps | Problem sketch due (turn in your freehand sketch to the lab. instructor) |
| 9 3/17           | Lect. - | Introduction to 3D drawings; wireframe, surface and solid modeling, primitive solids, Boolean Operation  
| Lab. -           | Solid Modeling; Lab. work #7 |
| 10 3/24-3/28     | Spring Recess |                          |
| 11 3/31          | Lect. - | Holiday – Cesar Chavez  
| Lab. -           | Solid Modeling: mechanical parts, Lab. work #8 |
| 12 4/7           | Lect. - | Solids Modeling; Assembly drawing, various mates, Top-down and bottom-up design approach  
| Lab. -           | Solid Modeling; assembly and exploded views, Lab. work #9 (assembly) |
|                  |         | Solution sketch due (turn in your freehand sketch to the lab. instructor) |
| 13 4/14          | Lect. - | Solid Modeling; Advance modeling techniques and Rendering  
| Lab. -           | Solid Modeling; Lab. work #10 (design problem, table) |
| 14 4/21          | Lect. - | Engineering Design Process; Concurrent engineering  
| Lab. -           | Solid Modeling; Design project documentation |
| 15 4/28          | Lect. - | Structural and welding drawings, manufacturing processes  
| Lab. -           | Solid Modeling; Design project documentation |
| 16 5/5           | Lect. - | Manufacturing processes, design project poster discussion and exam review  
| Lab. -           | Exam 3 (Creo) all lab. Sections; Monday (5/5), Tuesday (5/6), Wednesday (5/7), Thursday (5/8), 2 ½ hour exam during the lab. period. |
| 17 5/12          | Lect. - | No lecture or lab., Tuesday 5/13 is the last day of the semester |

**Design project poster Due Date**  
Friday, May 16, 8:30-9:30, E-407 (lab.)  
*No late poster will be accepted.*