

San Jose State University
Mechanical Engineering Department

ME 20

Design & Graphics

Fall 2018

Faculty: Prof. Ken Youssefi,
(Course Coordinator) Email: kyoussefi@aol.com
Office: E-137
Office hours: M 11-1, W 10:00-12:00

Final Exam: Wed., Dec. 12, 8:30-9:30 am (design project presentation), Room E-213

Lab. instructors: Victoria Reidling victoria.reidling@gmail.com, Marycruz Zelaya
zelaya.marycruz@gmail.com, Narayanan Ranganath narayanan.ranganath@hotmail.com,
Prof. Amir Ghazanfari, amir.ghazanfari@sjsu.edu

Course Website: **Canvas**, course syllabus, lecture notes, project description, lab. assignments, homework solutions are posted

Class time: *Lecture* **Monday 9:00 – 9:50 (section 1, 43559), E-189, Youssefi**

Labs.

Monday 10:00 – 12:45 (section 2, 43563), E-213, Instructor: Narayanan R.
Monday 1:30 – 4:15 (section 3, 43564), E-213, Instructor: Narayanan R.
Tuesday 9:00 – 11:45 (section 4, 43593), E-213, Instructor: Amir Ghazanfari
Wed. 9:00 – 11:45 (section 5, 43565), E-213, Instructor: Victoria Reidling
Thursday 9:00 – 11:15 (section 6, 47485), E-213, Instructor: Marycruz Zelaya

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: Co-requisite E10 for engineering majors

Required Text: Bertoline, Hartman and Ross “Fundamentals of Solid Modeling & Graphics Communication”, 7th ed., 2019, McGraw-Hill, custom bound version for Mechanical Engineering Dept. ME20 (soft cover) or loose leaf version. Both available in SJSU bookstore.

Recommended Text: SolidWorks tutorial,

You may download a free copy of SolidWorks, detail will be provided in the lecture

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 are strongly recommended, absence will affect your grade.

Laboratory assignments: Lab work will include solid modeling (3D) using SW. Try to finish the lab assignments during the lab period. **Refer to Canvas for the due date and the closed date for each assignment.** 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 works & Homework 20%, Exams (two) 50% , Project 20%, Class participation 10%

Lab section scores (SW exam) will be adjusted by the course coordinator in the event of large discrepancies between sections' scores.

Letter grade distribution

A+	98-100%	B+	84-86%	C+	71-73%	D+	57-59%
A	90-97%	B	77-83%	C	63-70%	D	49-56%
A-	87-89%	B-	74-76%	C-	60-62%	D-	46-48%
						F	46<

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
- Apply the proper dimensions and tolerances to parts.
- Prepare professional (formal) 2D views for fabrication.
- Draw three dimensional objects using SolidWorks (solid modeling software).
- Understand the engineering design process and the implementation of different design phases.

Academic Integrity: Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

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 to make 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](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center \(AEC\)](http://www.sjsu.edu/aec) at <http://www.sjsu.edu/aec> to establish a record of their disability.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See [University Policy S90-5](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf>. More detailed information on a variety of related topics is available in the [SJSU catalog](http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html), at <http://info.sjsu.edu/web-dbgen/narr/catalog/rec-12234.12506.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

SJSU Peer Connections

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

COURSE SCHEDULE

Week/Date (Mon.)	Subject	Reading Assign. (Ch., 7 th ed.)
1	8/21 – 8/23	No Labs on Tuesday, Wednesday and Thursday
2	8/27	Lect. - Introduction and course organization (1) Lab. - Introduction to 3D modeling using SW, lab. work #1 (Sketching and Extrusion).
3	9/3	Lect. - Holiday – Labor Day Lab. - Solid modeling with SW, lab. work #2 (Sketching and Extrusion)
4	9/10	Lect. - Introduction to 3D modeling: modeling fundamentals, (Polling practice) (2, 3, notes) surface and solid modeling Lab. - Solid modeling with SW, lab. work #3 (Extrusion and Revolve)
5	9/17	Lect. - Intro to 3D modeling; design intent, Boolean operations (Polling starts) (4, notes) Lab. - Solid modeling, Lab. work #4 (Revolve and Sweeps)
6	9/24	Lect. - Advanced 3D modeling technique; Sweep and Loft (4, notes) Lab. - SolidWorks, Lab. work #5 (Patterns and Loft) Product list due Friday Sept. 28 (upload to Canvas by 11:00 pm)
7	10/1	Lect. - Engineering Design Process: Concurrent engineering (2, notes) Lab. - SolidWorks, Lab. work #6 (Loft, Sweep and mechanical parts)
8	10/8	Lect. - Assembly drawing: top-down and bottom-up design approach (5, notes) Various mates and conditions Lab. - SolidWorks, Lab. work #7 (assembly and exploded views)
9	10/15	Lect. - Orthographic projection and standard 2D views (10, notes) Lab. - SolidWorks, Lab. work #8 (2D drawing from the 3D model and Revolve)
10	10/22	Lect. - Dimensioning and tolerancing (size and GDT); rules and standards (6,10, notes) Lab. – SolidWorks, Lab. work #9 (2D drawings with dimensions)
Problem sketch due Friday 10/26 (upload to Canvas, 11 pm), show the problem graphically, 3D sketch		
11	10/29	Lect. - Auxiliary views: classifications and applications (10) Section views; full, half and broken section views, conventions (10) Lab. - SolidWorks, Lab. work #10 (auxiliary and section views) HW 1 due during lect.
12	11/5	Lect. - Pictorials: Isometric Oblique, and Perspective (10, notes) Lab. - Exam 1(solid modeling, SW) all lab. sections: Monday (11/5), Tuesday (11/6), Wednesday (11/7), Thursday (11/8), 3-hour exam during the lab. period.
13	11/12	Lect. - Holiday – Veteran’s Day Lab. - SolidWorks, Lab. work # 11 (design problem, table) Solution sketch due Friday 11/16 (upload to Canvas, 11 pm), show the solution graphically, 3D sketch
14	11/19	Lect. - Freehand sketching technique and spatial visualization (3, notes) Lab. - SolidWorks, work on your design project HW 2 due during lect. No lab on Wed. 11/21 and Thursday 11/22 Holiday - Thanksgiving
15	11/26	Lect. - Formal engineering drawings; conventions and practices (10, notes) Lab. - SolidWorks, work on your design project HW 3 due during lect.
16	12/3	Lect. - Exam review, Structural and welding drawings Lab. – SolidWorks, work on your design project
17	12/10	Lect. - Exam 2 (one hour); written exam during the lecture period Lab. - No lab on Monday 12/10, last day of the semester

Design project poster Due Date

Wed., Dec. 12, 8:30-9:30, E-213 (lab.)

No late poster will be accepted

ky