San Jose State University
Mechanical Engineering Department

**All lectures and Friday lab will be synchronously online (live at the same day/time as scheduled)**

**ME 20** **Design & Graphics** **Fall 2021**


**Faculty:** Prof. Ken Youssefi, (Course Coordinator)
Email: kyoussefi@aol.com, or kourosh.youssefi@sjsu.edu
Office: E-116B
Office hours: M 10-11 and W 1:30-2:30 via zoom


**Final Exam: Friday Dec. 10, upload design project to Canvas by 11:59 pm.**

**Lab. instructors:** Rohan Khasgiwala rohan.khasgiwala@sjsu.edu, Yu Xian Lim yuxian.lim@sjsu.edu, Rohit Dantkale rohit.dantkale@sjsu.edu, George Hung yuh-hsin.hung@sjsu.edu

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

**Class time:** ***Lecture*** **Wednesday 9:00 – 9:50 (section 1, 42057) , online and synchronous, Youssefi**

***Labs*.**

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|---|---|---|---|
| Monday | 1:30 – 4:15 | (section 2, 42059), | in-person, E213, Instructor: Rohit |
| Tuesday | 9:00 – 11:45 | (section 3, 42060), | in-person, E213, Instructor: Yu Xian |
| Wed. | 1:30 – 4:15 | (section 4, 42081), | in-person, E213, Instructor: George |
| Thursday | 1:30 – 4:15 | (section 5, 42061), | in-person, E213, Instructor: George |
| Friday | 9:00 – 11:45 | (section 6, 42948), | online (sync), Instructor: Rohan |

**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). Available in SJSU bookstore. ISBN # 9781307317565.

**Recommended Text:** SolidWorks tutorial,
You need to download a free copy of **SolidWorks 2021/2022**, the download instruction is in Canvas in Modulus under Project.

**Design Project:** refer to the separate handout

**Homework:** homework assignments are posted on Canvas with the due date. Late homework, will not be accepted.

**Laboratory assignments**: Lab work will include solid modeling (3D) using SW. Try to finish the lab assignments during the lab period. **Lab assignments must be uploaded to Canvas**. **Refer to Canvas for the due date. Canvas upload will be closed after the due date. No assignment will be accepted after the due date.** 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 30%, Exams (two) 50% , Project 20%**

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 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 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 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) 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 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 at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop 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 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, 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 at http://peerconnections.sjsu.edu for more information.

## *COURSE SCHEDULE*

| Week/Date (Wed.) | | Subject | Reading Assign. (Ch., 7th ed.) |
|---|---|---|---|
| 1 | 8/19 (Th.) | Lect. - No lecture – semester starts on Thursday 8/19<br>Lab. - No Labs on Thursday, and Friday during the first week | |
| 2 | 8/25 | Lect. - Introduction, course organization, introduction to 3D modeling<br>Lab. - Introduction to 3D modeling using SW, lab. work #1 (Sketching and Extrusion). | (1, 2, 3, notes) |
| 3 | 9/1 | Lect. - Intro to 3D modeling; design intent, Boolean operations<br>Lab. - SolidWorks, lab. work #2 (Sketching and Extrusion) | (3, 4, notes) |
| 4 | 9/8 | Lect. - Intro to 3D modeling; Sweep and Loft<br>Lab. - SolidWorks, lab. work #3 (Extrusion and Revolve) | (4, notes) |
| 5 | 9/15 | Lect. - Orthographic projection and standard 2D views<br>Lab. - SolidWorks, Lab. work #4 (Sweep) | (10, notes) |
| 6 | 9/22 | Lect. - Assembly drawing: top-down and bottom-up design approach<br>Various mates and conditions<br>Lab. - SolidWorks, Lab. work #5 (Patterns and Loft)<br>**Product list due Friday Sept. 24 (upload to Canvas by 11:59 pm)** | (5, notes) |
| 7 | 9/29 | Lect. - Dimensioning standards and conventions<br>Lab. - SolidWorks, Lab. work #6 (Assembly and Exploded views) | (6,10, notes) |
| 8 | 10/6 | Lect. - Tolerancing (size and GDT); rules and standards<br>Lab. - SolidWorks, Lab. work #7 (2D drawing from the 3D model, dimensioning) | (6,10, notes) |
| 9 | 10/13 | Lect. - **A**uxiliary views: classifications and applications<br>Section views; full, half and broken section views, conventions<br>Lab. - SolidWorks, Lab. work #8 (2D drawings dimensioning and tolerancing) | (10)<br>(10) |
| 10 | 10/20 | Lect. - Advanced 3D modeling technique; Splines, Surface and Solid modeling<br>Lab. – SolidWorks, Lab work #9 (auxiliary and section views) | (notes) |
| **Problem sketch due Friday 10/22 (upload to Canvas, 11:59 pm), show the problem graphically, 3D sketch** | | | |
| 11 | 10/27 | Lect. - Engineering Design Process: Concurrent engineering<br>Lab. - SolidWorks, Lab. work #10 (Loft, Surface, Spline; bicycle handle, soap, Screwdriver)<br>**HW1 due 10/27 by 11:59pm upload to Canvas** | (2, notes) |
| 12 | 11/3 | Lect. - Pictorials: Isometric Oblique, and Perspective<br>Lab. - **Exam 1(solid modeling, SW) all lab. sections: Monday (11/1), Tuesday (11/2), Wednesday (11/3), Thursday (11/4), Fri. (11/5) 3-hour exam during the lab. period.** | (10, notes) |
| 13 | 11/10 | Lect. - Freehand sketching technique and spatial visualization<br>Lab. - SolidWorks, Lab. work # 11 (Trombone ) **HW2 due 11/10 by 11:59, upload to Canvas** | (3, notes) |
| **Solution sketch due Friday 11/12 (upload to Canvas, 11:59 pm), show the solution graphically, 3D sketch** | | | |
| 14 | 11/17 | Lect. - Exam review, Formal engineering drawings; conventions and practices<br>Lab. - SolidWorks, work on your design project **HW3 due 11/17 by 11:59, upload to Canvas** | (10, notes) |
| 15 | 11/24 | Lect. - **Holiday – Thanksgiving (Wed., Th. Fri.)**<br>Lab. - SolidWorks, work on your design project<br>**No lab on Wed. 11/24, Thursday 11/25 and Fri. 11/26** | |
| 16 | 12/1 | **Lect. - Exam 2 (one hour); written exam during the lecture period online**<br>Lab. - SolidWorks, work on your design project | |
| 17 | 12/6 | Lect. - Monday is the last day of the semester<br>Lab. - No lab on Monday 12/6 | |

## ***Design project folder Due Date***

**Friday, Dec. 10, upload design project folder to Canvas by 11:59 pm.**
***No late poster will be accepted***

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## Technology Requirements

Students are required to have an electronic device (laptop, desktop or tablet) with a camera and built-in microphone. SJSU has a free equipment loan program available for students: https://www.sjsu.edu/learnanywhere/equipment/index.php

Students are responsible for ensuring that they have access to reliable Wi-Fi during tests. If students are unable to have reliable Wi-Fi, they must inform the instructor, as soon as possible or at the latest one week before the test date to determine an alternative. See Learn Anywhere website for current Wi-Fi options on campus. https://www.sjsu.edu/learnanywhere/equipment/index.php

## Zoom Classroom Etiquette

- Mute Your Microphone: To help keep background noise to a minimum, make sure you mute your microphone when you are not speaking. **Webcam is required for the written exam online and lab section 6 on Friday.**

- Be Mindful of Background Noise and Distractions: Find a quiet place to "attend" class, to the greatest extent possible.

    ○ Avoid video setups where people may be walking behind you, people talking/making noise, etc.
    ○ Avoid activities that could create additional noise, such as shuffling papers, listening to music in the background, etc.

- Position Your Camera Properly: Be sure your webcam is in a stable position and focused at eye level.

- Limit Your Distractions/Avoid Multitasking: You can make it easier to focus on the meeting by turning off notifications, closing or minimizing running apps, and putting your smartphone away (unless you are using it to access Zoom).

- Use Appropriate Virtual Backgrounds: If using a virtual background, it should be appropriate and professional and should NOT suggest or include content that is objectively offensive or demeaning. Make sure your name and your picture is displayed.

## Recording of Zoom Classes

All lectures will be recorded and posted on Canvas. Students are permitted to only view the recordings, not to download the videos.

You must obtain permission in advance to record any course materials. Such permission allows the recordings to be used for a student's private, study purposes only. Students will not be permitted to share any class recordings with someone who isn't enrolled in the class or without permission. The recordings are protected by instructor's copyright.

Any student that needs accommodations or assistive technology due to a disability should work with the Accessible Education Center (AEC), and the instructor.

This course (lectures) will be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording). Students are not allowed to record without instructor permission Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office.

Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

## Technical difficulties

**Internet connection issues**: Canvas autosaves responses a few times per minute as long as there is an internet connection. If your internet connection is lost, Canvas will warn you but allow you to continue working on your exam. A brief loss of internet connection is unlikely to cause you to lose your work. However, a longer loss of connectivity or weak/unstable connection may jeopardize your exam.

**Other technical difficulties**: Immediately email the instructor a current copy of the state of your work/exam and explain the problem you are facing. Your instructor may not be able to respond immediately or provide technical.

**Contact the SJSU technical support for Canvas:**
Technical Support for Canvas Email: ecampus@sjsu.edu Phone: (408) 924-2337 https://www.sjsu.edu/ecampus/support/

## Academic Dishonesty

Students who are suspected of cheating will be referred to the Student Conduct and Ethical Development office and depending on the severity of the conduct, will receive a zero on the assignment or a grade of F in the course. Grade Forgiveness does not apply to courses for which the original grade was the result of a finding of academic dishonesty.