San Jose State University
Mechanical Engineering Department

ME 20	**Design & Graphics**	**Fall 2022**

Faculty:	Prof. Ken Youssefi,	Email: kyoussefi@aol.com
	(Course Coordinator)	Office: E-247
		Office hours: M 9-10, MW 5:45-6:45 pm (Zoom ID 886 7599 9225)

Final Exam: Monday, Dec. 12, 9:45-11:00 am   (Design Project Expo), Room E-189

Lab. instructors: Abouacar Traore aboubacarmanka.traore@sjsu.edu, Bharadawaj Jagannath, bharadawaj.jagannath@sjsu.edu, Kanishk Varun kanishk.varun@sjsu.edu, Venket Prasanna Kumar, venkatprassana.kumar@sjsu.edu, and Sagar Patil, sagarsanjeev.patil@sjsu.edu

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

Class time:	*Lecture*	**Monday**	**10:30 – 11:20**	**(section 1, 41832) , E-189,**	**Youssefi**
	Labs.				

Monday	1:30 – 4:15	(section 2, 41834),	E-213,	Instructor: Aboubacar
Tuesday	9:00 – 11:45	(section 3, 41835),	E-213,	Instructor: Bharadwaj
Wed.	1:30 – 4:15	(section 4, 41850),	E-213,	Instructor: Sagar
Thursday	1:30 – 4:15	(section 5, 41836),	E-213,	Instructor: Venket
Friday	9:00 – 11:45	(section 6, 42572),	E-213,	Instructor: Sagar
Tuesday	1:30 – 4:15	(section 7, 47914),	E-213,	Instructor: Kanishk

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 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. **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 25%, Exams (two) 50% , Project 20%, Class participation 5%
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.pdf) 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](http://www.sjsu.edu/aec) (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 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.

Week/Date (Mon.)		Subject	Reading Assign. (Ch., 7th ed.)

Week/Date (Mon.) — **Subject** — **Reading Assign. (Ch., 7th ed.)**

#	Date		
1	8/19	No Labs on Friday	
2	8/22	**Lect.** - Introduction and course organization	(1)
		Lab. - Introduction to 3D modeling using SW, lab. work #1 (Sketching and Extrusion).	
3	8/29	**Lect. -** Introduction to 3D modeling: modeling fundamentals, surface and solid modeling	(2, notes)
		Lab. - Solid modeling with SW, lab. work #2 (Sketching and Extrusion)	
4	9/5	**Lect.** - **Holiday – Labor Day**	
		Lab. - Solid modeling with SW, lab. work #3 (Extrusion and Revolve)	
5	9/12	**Lect.** - Intro to 3D modeling; design intent, Boolean operations	(4, notes)
		Lab. - Solid modeling, Lab. work #4 (Revolve and Sweep)	
6	9/19	**Lect.** - Advanced 3D modeling technique; Sweep and Loft	(4, notes)
		Lab. - SolidWorks, Lab. work #5 (Patterns and Loft)	
		Product list due Friday Sept. 23 (upload to Canvas by 11:59 pm)	
7	9/26	**Lect.** - Assembly drawing: top-down and bottom-up design approach	(5, notes)
		Various mates and conditions	
		Lab. - SolidWorks, Lab. work #6 (assembly and exploded views)	
8	10/3	**Lect.** - Orthographic projection and standard 2D views	(10, notes)
		Lab. - SolidWorks, Lab. work #7 (2D drawing from the 3D model and Revolve)	
9	10/10	**Lect.** - Dimensioning and Tolerancing (size and GDT); rules and standards	(6,10, notes)
		Lab. - SolidWorks, Lab. work #8 (shop drawings and Tolerancing)	
10	10/17	**Lect.** - Auxiliary views: classifications and applications	(10)
		Section views; full, half and broken section views, conventions	(10)
		Lab. - SolidWorks, Lab. work #9 (auxiliary and section views)	

Problem sketch due Friday 10/21 (upload to Canvas, 11:59 pm), show the problem graphically, 3D sketch

11	10/24	**Lect.** - Formal engineering drawings; conventions and practices	(notes)
		Lab. - SolidWorks, Lab. work #10 (bicycle handle, soap and screwdriver)	
		HW 1 due Mon. 10/24, upload to Canvas by 11:59pm	
12	10/31	**Lect. -** Pictorials: Isometric Oblique, and Perspective	(10, notes)
		Lab. - SolidWorks, Lab. work # 11 (Trombone) **HW 2 due Mon. 10/31, upload by 11:59 pm**	
13	11/7	**Lect.** - Freehand sketching technique and spatial visualization	(3, notes)
		Lab. - Work on your design project	
		No Friday lab. - Holiday – Veteran's Day (11/11)	

Solution sketch due Friday 11/11 (upload to Canvas, 11:59 pm), show the solution graphically, 3D sketch

14	11/14	**Lect.** - Exam 1 review, poster samples	
		Lab. - **Exam 1 (SolidWorks)) all lab. sections: Monday (11/14), Tuesday (11/15),**	
		Wed. (11/16), Thursday (11/17), Fri. (11/18) 3-hour exam during the lab. period	
15	11/21	**Lect.** - Engineering Design Process: Concurrent engineering	(2, notes) (10, notes)
		Lab. - work on design project (**Mon. and Tu.**), **No lab on Wed. 11/23, Thursday 11/24 and**	
		Fri. 11/25 Holiday – Thanksgiving HW 3 due Mon. 11/21, upload by 11:59pm	
16	11/28	**Lect.** - Exam 2 review	
		Lab. - SolidWorks, work on your design project	
17	12/5	**Lect. -** **Exam 2 (one hour); written exam during the lecture period in room E189**	
	12/6	**Lab.** – SolidWorks, work on your design project (Monday and Tuesday labs)	
		Last day of the semester	

Design project poster Due Date

Monday, Dec. 12, 9:45-11:00 am   (Design Project Expo), Room E-189