. San Jose State University
Mechanical Engineering Department

ME 20 **Design & Graphics** **Spring 2020**

Faculty: Dr. Ken Youssefi, Email: kyoussefi@aol.com
(Course Coordinator) Office: E-137
Office hours: MW 2:30-4:00 and W 10:30-11:30

Final Exam: Monday, May 18, 8:30-9:30 am (design project presentation), Room E-213

Lab. instructors: Victoria Reidling victoria.reidling@gmail.com, Yogesh Baloda yogesh.baloda@sjsu.edu, Lauren Fahey lauren@the-faheys.com, Jinseop Sim, jinseop.sim@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, 22875) , E-189, Youssefi**

Labs.

Monday	9:00 – 11:45	(section 2, 22876), E-213, Instructor: Jinseop
Tuesday	9:00 – 11:45	(section 3, 22877), E-213, Instructor: Yogesh
Wed.	10:00 – 12:45	(section 4, 22878), E-213, Instructor: Lauren
Thursday	1:30 – 4:15	(section 5, 22879), E-213, Instructor: Victoria

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

Required Text: Bertoline, Hartman and Ross "Fundamentals of Solid Modeling & Graphics Communication", 7th ed., 2019, McGraw-Hill, custom bound version for Mechanical Engineering Dept.

Recommended Text: SolidWorks tutorial
You may download a free copy of SolidWorks. See the instructions in Modules section of the ME20 Canvas 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 are strongly recommended, absence will affect your grade.*

Laboratory assignments: Lab work will include mostly 3D modeling using SolidWorks and some 2D drawing (orthographic projections) extracted from 3D model. Lab work assigned should be finished during

the lab period, unless specified otherwise by the lab. instructors. **Late lab work will not be accepted under any circumstances except health emergency**. 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 (Creo exam) will be adjusted by the course coordinator in the event of large discrepancies between sections.

Letter grade distribution

A+	**98-100%**	**B+**	**85-87%**	**C+**	**71-73%**	**D+**	**57-59%**
A	**91-97%**	**B**	**77-84%**	**C**	**63-70%**	**D**	**49-56%**
A-	**88-90%**	**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).
- Understand the engineering design process and the implementation of different design phases.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/

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	1/23 (Th.)	No Lab on Thursday of this week	
2	1/29	Lect. - Introduction and course organization	(1)
		Lab. - Introduction to 3D modeling using SW; lab. work #1 (Sketching and Extrusion)	
		Activate your Reef Polling, instruction on Canvas	
3	2/5	Lect. - Introduction to 3D modeling; modeling fundamentals,	(2, 3, notes)
		surface and solid modeling **Practice Reef Polling in Lecture**	
		Lab. - Solid modeling with SW; lab. work #2 (Sketching and Extrusion)	
4	2/12	Lect. - Intro to 3D modeling; design intent, Boolean operations	(4, notes)
		Reef Polling starts on Wed. Feb. 12	
		Lab. - Solid modeling with SW; lab. work #3 (Extrusion, Revolve, Pattern, Ribs)	
5	2/19	Lect. - Advanced 3D modeling technique; Sweeps and Lofts	(4, notes)
		Lab. - Solid modeling; Lab. work #4 (Sweeps)	
		Product list due Friday Feb. 21 by 11:59 pm (upload to Canvas)	
6	2/26	Lect. - Assembly drawing; top-down and bottom-up design approach	(5, notes)
		Various mates and conditions	
		Lab. - SW; Lab. work #5 (angled Reference planes and Lofts)	
7	3/4	Lect. - Orthographic projection and standard 2D views	(10, notes)
		Lab. - SW; Lab. work #6 (bicycle handle, soap, screwdriver)	
8	3/11	Lect. - Dimensioning and tolerancing (size and GDT); rules and standards	(6, 10, notes)
		Lab. - SW; Lab. work #7 (assembly and exploded views)	
9	3/18	Lect. - Engineering Design Process; Concurrent engineering	(2, notes)
		Lab. - SW, Lab. work #8 (2D drawing from the 3D model)	
Problem sketch due F 3/20 (upload to Canvas by 11:59 pm), show the problem graphically, 3D sketch			
10	3/25	Lect. - **A**uxiliary views; classifications and applications	(10, notes)
		Section views; full, half and broken section views, conventions	(10, notes)
		Review Exam 2	
		Lab. - SW; Lab. work #9 (2D drawings with dimensions)	**HW 1 due during lect.**
11	**3/30-4/3**	***Spring Recess***	
12	4/8	Lect. - Formal engineering drawings; conventions and practices	(10, notes)
		Lab. - **Exam 1(solid modeling, SW) all lab. sections: Monday (4/6), Tuesday (4/7),**	
		Wednesday (4/8), Thursday (4/9), 2 ½ - hour exam during the lab. period.	
13	4/15	Lect. - Pictorials; Isometric Oblique, and Perspective	(10, notes)
		Lab. - SW; Lab. work #10 (auxiliary and section views)	**HW 2 due during lect.**
Solution sketch due Fri. 4/17 (upload to Canvas by 11:59 pm), show the solution graphically, 3D sketch			
14	4/22	Lect. - Freehand sketching technique	(notes)
		Lab. - SW; Lab. work # 11 (design problem, table)	**HW 3 due during lect.**
15	4/29	Lect. - Spatial Visualization, **exam review**	(notes)
		Lab. - SW; work on your design project	
16	5/6	Lect. - **Exam 2 (one hour); written exam during the lecture period**	
		Lab. - SW; work on your design project	
17	5/11	Lab. - no lab on Monday (last day of the semester)	

Design project poster Due Date

Monday, May 18, 8:30-9:30, E-213 (lab.) ***No late poster will be accepted*** ky