

Design and Graphics Section 1

ME-20

Spring 2022 01/26/2022 to 05/16/2022 Modified 01/28/2022

Contact Information

Instructor: Dr. Vimal K Viswanathan

Email: vimal.viswanathan@sjsu.edu

Office: E 310

Phone: 408-924-3841

Lab Instructors:

Section 02: T 9:00 AM - 11:45 AM: Yu Xian Lim (yuxian.lim@sjsu.edu)

Section 03: W 9:00 AM - 11:45 AM: Rohit Dantkale (rohit.dantkale@sjsu.edu)

Section 04: Th 9:00 AM - 11:45 AM: Zichen Fang (zichen.fang@sjsu.edu)

Section 05: Th 1:30 PM - 4:15 PM: Sagar Sanjeev Patil (sagarsanjeev.patil@sjsu.edu)

Office Hours

(Dr. Viswanathan) M 10:20 - 11:30 AM

Online / E 310

Course Description and Requisites

2 unit(s)

Misc/Lab: Lecture 1 hour/lab 3 hours.

Introduction to design and graphical solutions to three-dimensional design problems involving points, lines, surfaces and solids. Development of visualization and technical sketching skills in conjunction with orthographic and pictorial projections. Focus on computer-aided design and graphical analytical methods.

Requisites

Corequisite(s):

Engineering majors: ENGR 10; Technology majors: none

Grading:

Letter Graded

* Classroom Protocols

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.

- 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 (only when classes are conducted online)

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 or portions of this course (i.e., lectures, discussions, student presentations) 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: 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.

Program Information

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.

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.

Course Learning Outcomes (CLOs)

Upon successful completion of this course, students will be able to:

1. Freehand sketch a 3D view of an object (isometric, oblique and perspective).
2. Draw the standard two dimensional views (top, front and profile) of an object.
3. Draw section and auxiliary views
4. Apply the proper dimensions and tolerances to parts.
5. Prepare professional (formal) 2D views for fabrication.
6. Draw three dimensional objects using SolidWorks (solid modeling software).
7. Understand the engineering design process and the implementation of different design phases.

Course Materials

Fundamental of Solid Modeling & Graphics Communication

Author: Bertoline, Hartman, and Ross

Publisher: McGraw Hill

Edition: Custom bound version for SJSU (soft cover)

ISBN: 9781307317565

Availability: Campus bookstore

SolidWorks Tutorials

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

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Design Project

Please refer to the separate handout

Homework

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

Lab 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.

In-class Quizzes

The in-class quizzes will be based on the materials covered in the class either on the same day or the previous week. The quizzes will be administered via iClickers. Instructions to join iClicker will be provided during the class.

✓ Grading Information

This course will use the following grading criteria

Criteria

Type	Weight	Topic	Notes
Lab work and homework	30		All the lab assignments will be posted on Canvas. Students are expected to complete lab assignments during the lab time. Each assignment will be due in two weeks from the date of the assignment.
Exams (two)	40		The midterm exam will be during the lab time and will last for the duration of the lab. The midterm will be a SolidWorks exam. The final will be administered via Canvas and will feature multiple choice question. The final exam will be during the last lecture period.
Design project	25		The details of the design project will be provided via a separate document. This will be an industry sponsored project and all the students are expected to complete a short presentation at the end of the project.
Class participation and Quizzes	05		Surprise quizzes will be administered via iClicker interface/app.

Breakdown

Grade	Range	Notes
A+	98 to 100	
A	90 to 97.99	
A-	87 to 89.99	
B+	84 to 86.99	
B	77 to 83.99	
B-	74 to 76.99	
C+	71 to 73.99	
C	63 to 70.99	
C-	60 to 62.99	
D+	57 to 59.99	
D	49 to 56.99	

Grade	Range	Notes
D-	46 to 48.99	
F	Less than 46	

University Policies

Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on [Syllabus Information web page](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>). Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

When	Topic	Notes
Week of 01/31 Lecture online (Zoom)	Introduction and course organization	Lab assignment: Sketching & Extrusion (in E213) Reading assignment: Textbook chapter 1, 2, 3 and class notes
Week of 02/07 Lecture online (Zoom)	Introduction to 3D modeling: modeling fundamentals	Lab assignment: Sketching & Extrusion (in E213) Reading: textbook chapter 4 and class notes
Week of 02/14 Lecture in E 189	Intro to 3D modeling: design intent, boolean operations	Lab assignment: Extrusion & revolve (in E213) Reading: textbook chapter 4 and class notes
Week of 02/21 Lecture in E 189	Intro to 3D modeling; Sweep and Loft	Lab: Revolve & Sweep (in E213) Reading: class notes
Week of 02/28 Lecture in E 189	Advanced 3D modeling technique; Splines, Surface and Solid modeling	Lab assignment: Pattern and swept blend (in E213) Reading: class notes
Week of 03/07 Lecture in E 189	Assembly drawing: top-down and bottom-up design approach, mates & conditions	Lab assignment: Surface modeling (in E213) Reading: Textbook chapter 10, class notes
Week of 03/14 Lecture in E 189	Orthographic projection and standard 2D views	Lab assignment: Assembly and Exploded Views (in E213) Reading: Textbook chapter 6, 10, class notes
Week of 03/21 Lecture in E 189	Dimensioning and tolerancing (size and GD&T); rules and standards	Lab assignment: Shop drawing and tolerancing (in E213) Reading: Textbook chapter 2, class notes

When	Topic	Notes
Week of 03/28	No classes - SPRING BREAK	NO LABS
Week of 04/04 Lecture in E 189	Engineering Design Process: Concurrent engineering	Lab assignment: Shop Drawings (in E 213) Reading: Textbook chapter 10
Week of 04/11 Lecture in E 189	Auxiliary views: classifications and applications; Section views; full, half and broken section views, conventions	MIDTERM EXAM - in Lab sessions (2 hours and 45 min long - in E213) Reading: Textbook chapter 10, class notes
Week of 04/18 Lecture in E 189	Pictorials: Isometric Oblique, and Perspective	Lab assignment: Section and Auxiliary views (in E 213) Reading: Textbook chapter 3, class notes
Week of 04/25 Lecture in E 189	Freehand sketching technique and spatial visualization	Lab assignment: Creative Design Problem (in E213) Reading Assignment: Class notes, textbook chapter 10
Week of 05/02 Lecture in E 189	Formal engineering drawings; conventions and practices	No labs - time to work with your team on your project (E213 is available for project work)
Week of 05/09 Lecture in E 189	Review for the final exam	No labs - time to work with your team on your project (E213 is available)
On 05/16 FINAL EXAM in E 189	Final exam will be administered via Canvas	05/16 is the last day of instruction. No labs. Project presentations TBA.
On 05/24, 9:30 am Canvas	Design Project Folder is Due	Please refer to the design project handout for details. No late submissions will be accepted.