

San José State University
Department of Mechanical Engineering
ME 201 Project Planning, Section 02, Fall 2022

Course and Contact Information

Class Days/Time:	Fridays 4:30 PM to 5:45 PM, with additional meetings TBD
Classroom:	Online only (link posted in Canvas)
Registration Code:	50890, 3 units
Prerequisites:	Good standing in the MSME program.
Instructor:	Sang-Joon (John) Lee
Office Location:	Online only (link posted in Canvas)
Telephone:	408-924-7167
Email:	sang-joon.lee@sjsu.edu
Office Hours:	Mondays and Wednesdays 10:30 AM to 11:30 AM

Course Format

This class is fully online and requires use of the Canvas learning management system (LMS), accessed via <https://sjsu.instructure.com/>. Successful completion of course requirements necessitates accessing the course website frequently. Class meetings will be held over Zoom web conferencing <https://sjsu.zoom.us/>. Technical support is available at <http://www.sjsu.edu/ecampus/>. Important communications regarding this class may be sent via Canvas or to student email addresses listed in MySJSU, and thus each student is expected to maintain up-to-date contact information in both systems. Unless otherwise specified, formal assignments are to be submitted in PDF format. For formative feedback, the class will routinely use Google Workspace apps (e.g., Docs, Sheets, Slides), accessed via SJSUOne credentials.

Course Description: https://catalog.sjsu.edu/preview_course_nopop.php?catoid=13&coid=117455

Preparation for independent projects, research investigations, and professional engineering proposals. Review of scholarly literature. Development of formal objective statements and research hypotheses. Planning and articulation of tangible deliverables, resources, tasks, and milestones. Note: This course satisfies graduate-level GVAR in this master's program.

Course Learning Outcomes

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

1. Perform a thorough literature search based on scholarly primary sources and write a professional literature review.
2. Develop a formal objective statement for a meaningful open-ended project or formulate a hypothesis for a contemporary research study in mechanical engineering.
3. Articulate specific and tangible deliverables that manifest an engineering solution or research evidence.
4. Develop a detailed project plan including structured tasks, available resources, significant milestones, and realistic timeline.
5. Write a comprehensive proposal for an independent engineering project or research investigation.
6. Conduct preliminary design, analysis, calculations, simulation, and/or feasibility study that contributes tangibly to meeting project objectives or interrogating a research hypothesis.

This MSME Program Educational Objectives (PEOs) that this course most directly addresses are:

- PEO #2: Professional and lifelong learning skills to be able to apply and extend theory to solve practical contemporary engineering problems.
- PEO #4: Strong verbal and written communication skills, including the ability to read, write and comprehend technical documents.
- PEO #5 (partially): Ability to think and work independently to perform design and in-depth analysis in solving open-ended mechanical engineering problems.

Required Reading

Selected reading will be assigned throughout the semester, which may include guide documents from ME faculty, articles from scholarly publications, and application notes.

Library Resources and Writing Support

The engineering librarian as listed at <https://library.sjsu.edu/staff-directory/subject-librarians> can provide faculty and students with research instruction and resources, as needed, in person and online through the library website <http://library.sjsu.edu/>. Research guides <http://libguides.sjsu.edu/> are accessible for departments and subject areas, including a guide specific to mechanical engineering at <http://libguides.sjsu.edu/me>.

This class has the benefit of a **course-embedded tutor**, who is a student trained by the SJSU Writing Center <https://www.sjsu.edu/writingcenter/> to work with students and instructors as part of the class learning community. Our embedded tutor this semester is Karen Liou, who throughout the semester will familiarize and support your needs as a writer. This type of writing support offers the opportunity to work with an advanced writer who knows the assignments and expectations of the class. Details regarding availability and scheduling will be announced early in the semester. In addition to specialized support from our embedded tutor, the Writing Center has several other resources (handouts, workshops, and additional appointments) that are open to all SJSU students.

Course Requirements and Assignments

University policies relevant to syllabi are posted at <https://www.sjsu.edu/curriculum/courses/syllabus-info.php>. As stated, “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 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 practica. Other course structures will have equivalent workload expectations as described in the syllabus.”

Participation Tasks: Throughout the semester there will be several participation tasks to promote active engagement, regularity, and accountability. Specific examples include assigned discussion posts, checkpoint assignments (e.g., tentative titles, list of prospective mentors), and peer review. Tasks may be in-class or online. Accordingly, it is important to attend class and to check Canvas regularly with no lapses of more than a few days.

Proposal Documents: A thorough and professionally prepared project proposal is the primary deliverable item for this course. There are three major components of the proposal: (1) Literature Review, (2) Project Plan, and (3) Preliminary Work Report. Each of these documents must be individual original work. Expectations will be communicated by separate documents for each assignment. This set of documents will be compiled, integrated, refined, and submitted as a Full Proposal at the end of the semester.

Collectively, class writing assignments are worth 75% of the course grade. The Full Proposal requires a minimum of 3000 words (approximately 12 pages) of body text, not including front matter, headings, figures, tables, references, or appendices. Proposal documents must follow professional writing standards. This class will follow SJSU thesis guidelines <http://www.sjsu.edu/cgs/current-students/thesis-and-dissertation-information/>, supplemented by the IEEE Editorial Style Manual <https://journals.ieeeauthorcenter.ieee.org/your-role-in-article-production/ieee-editorial-style-manual/> and ASME conference guidelines <https://www.asme.org/publications-submissions/proceedings/conference-publications>.

Video Synopsis: Near the end of the semester, each student will compose a concise video-narrated synopsis of his or her proposal. In addition to providing closure, preparation of the synopsis has the benefit of developing thoughtful awareness of how to propose an endeavor with efficient verbal communication and concisely informative visual elements.

Preliminary Work: Each student is required to identify and begin applying distinct new engineering skills that are likely to contribute meaningfully to the project that is proposed. While some of these skills may have been introduced in prior coursework or industry experience, others might require substantial independent learning. In all cases the intent of this requirement is to customize practical skills for the unique needs of an open-ended project.

This class does not "teach" such diverse skills, but may provide helpful tutorial references and limited advice in some cases. Selection of applicable skills and scope should be guided by advice from prospective project advisors and are subject to instructor approval. Grading will be manifested as a combination of participation tasks and what is reported in the Preliminary Work Report. Some representative examples are listed below, but the list is not intended to be exhaustive.

- Sensor selection, interfacing, and calibration (e.g., strain gauges, thermocouples, load cells, ...)
- Actuator selection, interfacing, and testing (e.g., motors, solenoids, pneumatic cylinders, ...)
- Data acquisition system configuration and testing (e.g., analog vs. digital signals, amplifiers, filters, ...)
- Software coding (e.g., Python, MATLAB, C++, or otherwise...)
- Software-driven instrument control (e.g., microcontrollers, serial communication, ...)
- Experimental uncertainty analysis and error propagation
- Statistical design of experiments and analysis-of-variance (ANOVA)
- Data fitting and regression models
- Data file manipulation and image analysis (e.g., feature recognition, Fourier analysis, ...)
- Geometric dimensioning and tolerancing (GD&T)

Grading Information

The course grade is calculated from a weighted sum of all graded components as follows:

- 15% for Participation Tasks
- 20% for Literature Review
- 25% for Project Plan
- 15% for Preliminary Work Report
- 10% for Video Synopsis
- 15% for Full Proposal

This course is graded by letter grade. Percentage points correspond to letter grades as follows:

93.0-100 A | 90.0-92.9 A- | 87.0-89.9 B+ | 83.0-86.9 B | 80.0-82.9 B-
77.0-79.9 C+ | 73.0-76.9 C | 70.0-72.9 C- | 67.0-69.9 D+ | 63.0-66.9 D | 60.0-62.9 D- | 0-59.9 F

Peer Evaluation: Peer review is essential in scholarly work, and peer feedback is used frequently in this class. Much of your submitted work will be visible to classmates for open feedback. For some assignments, peer evaluation may be used for a portion of grading. Alternative options will be considered for compelling reasons, but arrangements must be requested and pre-approved in writing with ample time before corresponding deadlines (i.e., several days in advance).

Late Policy: Unless otherwise specified for a particular assignment, work that is submitted late will be accepted with reduced credit according to a depreciation rate of 1.5% for each late hour breached.

Exceptions: Any grading appeals or petitions must be communicated promptly in writing (or email). Exceptions will normally be evaluated at the very end of the semester in context with an individual's overall semester track record and all other exceptions class-wide. Special consideration for truly unavoidable and extenuating circumstances will depend on timeliness and supporting documentation (e.g., doctor's note, police report).

University Policies

In accordance with University Policy S16-9 <http://www.sjsu.edu/senate/docs/S16-9.pdf>, the following link contains university-wide policy information relevant to all courses, such as academic integrity, accommodations, and related concerns: <https://www.sjsu.edu/curriculum/courses/syllabus-info.php>.

Academic Technology Requirements

Students are required to have an electronic device (laptop, desktop or tablet) with audio. Campus-level resources for technology needs (including equipment loans) are described at <https://www.sjsu.edu/learnanywhere/equipment/>.

Recording Policy

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 (lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. University Policy S12-17 <https://www.sjsu.edu/senate/docs/S12-7.pdf> 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 who require special accommodations or assistive technology due to a disability to notify the instructor.

Course Schedule

Subject to change with fair notice via announcement in class or notification via Canvas. Class members should reserve all regular periods for synchronous online attendance, although some class meetings may be used as open working sessions.

Dates	Topic	<u>Tentative and approximate</u> deadlines
8/19	Introduction and course logistics	
8/26	Faculty research profiles and representative topics	List of keywords
9/2	Searching, evaluating, and efficiently digesting literature Citation management (and software tools)	List of potential principal advisors
9/9	Organizing and writing literature reviews Plagiarism and copyright infringement	Initial collection and sorting of literature
9/16	Objective statements and research hypotheses Articulating tangible and specific deliverables	Draft of Literature Review
9/23	Writing with clarity and informative value Common concerns in engineering writing	Draft of objective statement or research hypothesis
9/30	Evaluation metrics Verification and validation	Literature Review
10/7	Project plans and work breakdown structures	List of deliverables and evaluation metrics
10/14	Self-directed learning and preliminary work	Draft of Project Plan
10/21	Applying engineering theory in theses and projects	Commitment from principal advisor
10/28	Visual representation of data Presentation best practices	Project Plan
11/4	Artifact, data, and document management	Draft of Preliminary Work Report
11/11	<i>Veteran's Day holiday (no class meeting)</i>	Draft of Video Synopsis content
11/18	MSME project and thesis logistics Working with advisors and committees	Preliminary Work Report
11/25	<i>Thanksgiving holiday (no class meeting)</i>	Video Synopsis
12/2	Video Synopsis viewing and peer evaluation	List of potential committee members
12/9	Video Synopsis viewing and peer evaluation	Full Proposal

Unless in direct conflict with another final exam, all class members are expected to reserve the university-designated final exam time as posted at <https://www.sjsu.edu/classes/final-exam-schedule/fall-2022.php>: **Wednesday, December 14 from 2:45 PM to 5:00 PM**. The period may be used for additional Video Synopsis presentations and peer evaluation.