San José State University
Department of Mechanical Engineering
ME 201 Project Planning, Section 01, Spring 2020

Course and Contact Information

Class Days/Time:	Tuesdays and Thursdays 4:30 PM to 5:45 PM
Classroom:	Engineering 115
Registration Code:	30268, 3 units
Prerequisites:	Good standing in the MSME program. Not available via Open University.
Instructor:	Sang-Joon (John) Lee
Office Location:	Engineering 115A
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Office Hours:	Mondays and Wednesdays 2:00 PM to 3:00 PM, and by appointment

Course Format

This class is run in mixed-mode, with in-person class meetings and online activities. Online components require 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, typically at least twice a week on a regular basis. Technical support for Canvas 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.

Course Description http://info.sjsu.edu/web-dbgen/catalog/courses/ME201.html

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 GWAR 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

The liaison librarian as listed at http://library.sjsu.edu/staff-directory/sjsu-library-subject-liaisons 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.

Course Requirements and Assignments

According to the Office of Graduate and Undergraduate Programs http://www.sjsu.edu/gup/syllabusinfo/, "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 four major components of the proposal: (1) Literature Review, (2) Project Definition, (3) Implementation Plan, and (4) Preliminary Work Report. Each of these documents must be individual original work. Detailed expectations will be provided by separate documents via Canvas, and each component will be due at incremental stages throughout the semester. This set of documents ultimately will be compiled, refined, and submitted as a Full Proposal at the end of the semester.

Collectively, these writing assignments are worth 80% of the course grade. The Full Proposal requires a minimum of 3000 words (approximately 12 pages), not including pictures, figures, tables, front matter, or appendices. Proposal documents must follow professional writing standards. For ME 201, we will use a combination of standard fomatting expectations based on the SJSU thesis guidelines http://www.sjsu.edu/cgs/current-students/thesis-and-dissertation-information/ and ASME conference guidelines https://www.asme.org/shop/proceedings/conference-publications/author-guidelines.

Video Synopsis: Near the end of the semester, each student will compose a very concise video-narrated synopsis of his or her proposal. In addition to providing closure value for the class, 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.

Practical Engineering Skills: Each student is required to identify and begin applying at least two distinct practical engineering skills that are likely to contribute meaningfully to the project that is proposed. While some of these skills may have been learned 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.

Examples of practical skills that can be applied to preparatory and preliminary work:

- Sensor selection, interfacing, and calibration (e.g., strain gauges, thermocouples, load cells, ...)
- Actuator selection, interfacting, and operation (e.g., servomotors, solenoids, pneumatic cylinders, ...)
- Data acquisition system configuration and testing (e.g., analog vs. digital signals, amplifiers, filters, ...)
- Engineering software coding (e.g., MATLAB, Python, C++, Java, ...)
- Software-driven instrument control (e.g., microcontrollers, serial communication, ...)
- Experimental uncertainty analysis and error propagation
- Justification of probability distributions and application of significance testing
- Statistical design of experiments, computation of factor effects, and analysis-of-variance
- Experimental data fitting and formulation of 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
- 15% for Project Definition
- 15% for Implementation Plan
- 20% for Preliminary Work Report
- 10% for Full Proposal (compilation, updating, and refinement of prior documents)
- 5% for Video Synopsis

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

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 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 or police report).

University Policies

In accordance with University Policy S16-9 http://www.sjsu.edu/senate/docs/S16-9.pdf, the link below contains university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. http://www.sjsu.edu/gup/syllabusinfo/ .

Course Schedule

Subject to change with fair notice via announcement in class or notification via Canvas. Class members should reserve all regular periods for in-person attendance. However, after the lesson topics have been presented and discussed, some class meetings may be reallocated or rescheduled for open working sessions, formative feedback, and individualized attention.

Week	Dates	Topic	Approximate distribution of deadlines (exact deadlines identified in Canvas)
1	1/23	Introduction and course logistics	
2	1/28 1/30	Faculty research profiles and representative topics	
3	2/4 2/6	Objective statements and research hypotheses	List of prospective mentors
4	2/11 2/13	Literature searching and primary sources Citation management (and software)	List of prospective objective statements or research hypotheses
5	2/18 2/20	Organizing and writing literature reviews Plagiarism and copyright infringement	Literature compilation (citations only)
6	2/25 2/27	Articulating tangible and specific deliverables	Draft of Literature Review
7	3/3 3/5	Evaluation metrics	**Literature Review**
8	3/10 3/12	Applying engineering theory Verification and validation	Draft of Project Definition
9	3/17 3/19	Implementation planning	**Project Definition**
10	3/24 3/26	Practical engineering skills (selection of new skills to learn and apply specifically to the proposed project)	Commitment from principal advisor
11	3/31 4/2	Spring Recess (no classes)	Draft of Implementation Plan
12	4/7 4/9	Common flaws in grammar and writing style	**Implementation Plan**
13	4/14 4/16	Best practices in visual representation of data	
14	4/21 4/23	Document and data management	Draft of Preliminary Work Report
15	4/28 4/30	Best practices in working with advisors	**Preliminary Work Report**
16	5/5 5/7	Working session on Video Synopsis and Full Proposal	Evaluations from prospective advisors

The deadline for the Video Synopsis is **Sunday, May 10th at 11:59 PM**. The deadline for the Full Proposal is **Wednesday, May 13th at 5:00 PM**, coinciding with the end of the university-designated Final Exam period http://info.sjsu.edu/static/catalog/final-exam-schedule-spring.html for this class.