

MSE488A - MSEM Senior Design I (2 units)

CSUN - Fall 2026; Ticket # 16140; On-campus Lab JD-1126 & Online via CANVAS.

Lab meetings schedule: Tuesdays & Thursdays from 8:30 a.m. till 11:15 a.m.

<u>Instructor</u>	<i>Ghassan “Gus” H. Elias</i> : BS/MS; Industrial/Manufacturing Systems Engineering - Expertise : Engineering Consulting, Decision-Making/Risk Analysis and Facility Planning. Quality Assurance & Control, Industrial Safety & Material Control - global certification programs for installing & commissioning electronic & pneumatic devices in General (Non-Hazardous) Locations, Hazardous ‘Classified’ Areas & Potentially Explosive Atmospheres. Email address: Gus.Elias@csun.edu MSEM Department Office: JD-4510; (818) 677-2167 Faculty Office: JD-3308 Office hours: contact by Email & Via CANVAS to set an appointment.
<i>Textbook</i>	None. Pertinent material will be conveyed in the lab and via Canvas
<i>Instructor Website</i>	CSUN webpage: http://www.csun.edu/~ghe59995/
<i>Catalog Description</i>	In the senior design course that covers the whole senior year (two consecutive semesters), students are expected to put into use their knowledge on engineering problem solving and solve complex, open-ended problems that are relevant to the industry. Students work in teams to tackle engineering/innovative design projects that are under multiple constraints as they are in real life. These restraints can be economic, environmental, social, political, beneficial, ethical, health-related, aiming at manufacturability, sustainability, and other relevant factors.
<i>Prerequisites</i>	MSE402, MSE407, MSE409/L and MSE 412/L for MSEM Majors. For Engineering Management majors: MSE402, MSE407. Co-requisite: MSE420. A passing score is required on the Upper division Writing Proficiency Exam (UDWPE) for both EM and MSEM majors.

Note: MSE488A and MSE488BCS must be completed during the same academic year over 2 consecutive semesters.

Course Objectives This course is designed to facilitate ability to:

- Developing a project using the previously learned skills, with economic, environmental, social, political, ethical, & health-related constraints.
- Developing a project plan to be followed & utilizing appropriate equipment and software in performing the project work.
- Being resourceful in gathering information necessary to complete the design project & functioning effectively on a design team.
- Communicating with their peers as teammates as well as their superiors as their advisors. Writing effective project reports and progress reports that communicate the work performed. Delivering oral presentations of work performed.
- Demonstrating ability to utilize program-related knowledge in an open-ended professional design experience.
- Developing a prototype within economic constraints and projecting the actual manufacturing timeline of the product taking into consideration economies of scale.

Student Learning Outcomes

In this course, students are expected to attain or improve on their ability to:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics --- (ABET 1).
- Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, welfare, as well as global, cultural, social, environmental, & economic factors --- (ABET 2).
- Communicate effectively with a range of audiences --- (ABET 3).
- Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts --- (ABET 4).
- Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives --- (ABET 5).
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions --- (ABET 6).
- Acquire and apply new knowledge as needed, using appropriate learning strategies --- (ABET 7).

STANDARD OPERATING PROCEDURES:

1. Class members are expected to maintain personal and professional standards consistent

with the Code of Ethics of the national Society of Professional Engineers, the Preamble and Fundamental Canons of which are as follows:

Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct. Engineers, in the fulfillment of their professional duties, shall:

- *Hold paramount the safety, health and welfare of the public.*
- *Perform services only in areas of their competence.*
- *Issue public statements only in an objective and truthful manner.*
- *Act for each employer or client as faithful agents or trustees.*
- *Avoid deceptive acts.*
- *Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.*

2. Students must submit **ORIGINAL WORK** only.

3. Students are expected to participate in **ALL** discussion threads on CANVAS.

4. Class members are **responsible** for the course material, reading assignments, presentations and discussions.

5. *Tardy/Late submissions are unacceptable.....NO EXCEPTIONS!*

6. Class members **MUST** always be **considerate & respectful** to their colleagues and to the instructor.

***** This course syllabus is your contract with the CECS, MSEM and the instructor. Students must read the syllabus thoroughly and adhere fully to ALL of the stated terms and listed guidelines. No Exceptions! *****

NOTE #1: Activate **and** use your CSUN email address for ALL academic correspondences. Do not use your personal email address to communicate with the instructor. Messages from non-CSUN email addresses will **NOT** be acknowledged. Instructor will only utilize SOLAR's email database to communicate with class.

NOTE #2: Failure to formally drop a course within the allotted time frame by CSUN will result in the issuance of a "WU" grade which is equivalent to "F", thus detrimentally affecting your GPA.

COURSE EVALUATION / GRADE SCALE

(Refer to the last page of the syllabus for more information on grades)

(7 pts) - Lab attendance and class participation.

(13 pts) - Throughout the Semester -- Mandatory Contribution to the Weekly Discussions on CANVAS.

Important Note: The weekly discussions are locked in a 1-week period -- If you miss it, you lose it !!

DO NOT ASK FOR AN EXTENSION!!!!!!

(30 pts) - Project Progress Reports 1 thru 3 -- each group report submission is worth 10 points. In class presentations by all group members are required.

(50 pts) - Group Term Project: Final written report and the PPT Presentations.

This will occur during the last lab session.

Submittal of the Self & Peer Evaluation Form (SPEF) is **MANDATORY**.

You can download the form via the MSE488A webpage. It will also be posted on CANVAS.

Important Notice: By not submitting the SPEF, the student will forfeit the +/- sign for the course grade.

Letter-Grade Scale (Curving of grades will **NOT be utilized!):**

$A \geq 94$	$90 \leq A- < 94$	$85 \leq B+ < 90$
$80 \leq B < 85$	$78 \leq B- < 80$	$75 \leq C+ < 78$
$70 \leq C < 75$	$60 \leq D < 70$	$F < 60$



The use of mobile phones is prohibited during lectures & exams. No Exceptions!!!

Proposed Schedule/Plan (may change if necessary!)

This is a tentative schedule/plan. Modifications may be made throughout the semester to meet the requirements and the needs of the class given all of the relevant circumstances.

Week 1: Introduction, course outline & overall expectations. Initiating brainstorming sessions.

Week 2: Determine project scope and select group facilitators/leaders. Delegate important tasks such as document control, procurement, CAD experts, checkers, QC/QA, advisors, research & data collectors.

Task Due: Informal Project Proposal is to be uploaded on CANVAS to select a project.

Week 3: Now that the projects are formally selected, each team will start working on their projects. First task is to write a proposal that highlights the project title and key objectives to be completed by the end of the project. The proposal must be approved by the course instructor and all group members. This will serve as an official contract between students and advisors regarding the project and the objectives.

Week 4: Due: Formal Project Progress Report (**PPR1**) along with a **detailed** Gantt Chart and preliminary design sketches. In-class presentation is required. All group members must attend and participate. **How can your prototype be developed? What is the actual plan for ordering parts, assembly processes and the end-product?**

Task Due: Project Progress Report #1 (PPR1) is to be uploaded on CANVAS.

Week 5: Teams will start developing a detailed action plan proposal. This consists of plans on how to complete the project on time. This will be done through modifying the initial Gantt chart and stating new processes, guidelines and procedures. Teams should also begin the design stage of their now-well-defined projects. Also, a thorough literature review including a detailed patent search must be conducted starting this week and going on until the end of the project. For market analysis, at least five recent (within six years or less) references should be included in the final literature review.

Week 6: Advancing the design/layout phases, refining the offering objectives **and** manufacturing steps.

Week 7: Overall justification and analysis of the innovative project --- revisiting the initial purpose and modifying it if necessary, stating the benefits, feasibility, cost advantage, competitive leverage, viability, and identifying the targeted marketplace along with the methodologies needed to enter it. Must review the initial problem statement, hypothesis, definitions, limitations, complications and new assertions. This is a critical stage in setting the guidelines and scope of the project. Students should start working on the introduction, as well as finalizing the initial design and literature review. **Status of the prototype?**

Week 8: Manufacturing process should be evaluated and enhanced to meet the desired objectives. This includes preparing the BOM, ordering the materials, procuring the parts needed to complete the project.

Week 9: Manufacturing process continues. Evaluate your position at the time. Do a **GAP** Analysis!!!

Task Due: Project Progress Report #2 (PPR2) covering the design objectives, current status, hurdles and complications (if any), literature review, up-to-date budget analysis and cost schedule, and an updated Gantt chart. State the current/exact status of your design and prototyping processes!

Week 10: Physical product samples and/or components, prototypes should be available for review.

Week 11: Manufacturing refinement process continues. **Listing possible innovations to your design?**

Week 12: Up-to-date activities, manufacturing evaluation & production review. Possible modifications?

Week 13: Course re-cap, future plans for MSE488BCS along with an overall project evaluation.

Week 14: **THANKSGIVING HOLIDAY BREAK ---- Be safe & enjoy!**

Week 15: Due: Final project report. Teams make their in-class presentations. MSEM Faculty invited.

Task Due: Project Progress Report #3 (PPR3) covering the design objectives, current status, complications and hurdles (if any) and how to overcome them, literature review, up-to-date budget & cost schedule, anticipation for possible changes, and an updated Gantt chart.

Week 16: N/A for this class Final Examinations Week at CSUN --- **GOOD LUCK y'all** 😊😊😊😊

GROUP TERM PROJECT GUIDELINES:

- Groups will be randomly assembled to consist of 4-6 members each.
- Topics for the group term project will be assigned by the instructor.
- The term project is worth **50%** of the course overall grade.
- All class members must participate in the research task & presentation.
- The **mandatory** "Self & Peer Evaluation Form" (posted on CANVAS and the course website) is due in Week #15. Submitting the form is 100% mandatory by all class members. The form should be "**typed**" and **not** hand-written or scanned. Students will individually and confidentially submit the form in **PDF** via a special link made available in the course module on CANVAS.
- The complete Project PPT file and written report are due (**one upload per group!**) The due date will be announced in class and posted on CANVAS. Each group leader/facilitator shall upload the **PPT** file via a special link to be made available in the course module on CANVAS. **The PPT** must contain **42-45** slides and should be done professionally. The presentation must be informative, creative, rich, insightful and reader-friendly. The final report should be comprehensive covering **all** aspects of the assigned project; most importantly the viability of your innovative design. Follow the "Oral Presentations Rubric" shown on Page 7 of the syllabus.

Submissions that do not conform to the above format will not be accepted.

It is a fundamental principle of academic integrity that the authorship of the intellectual content of works submitted as part of a class assignment must be fairly represented. Contributions of language and thought must be appropriately credited.

Academic Dishonesty:

Academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form at California State University Northridge. All students involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension and/or expulsion from the University.

Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person. The instructor reserves the right to submit your papers to turnitin.com or other inspection applications for identifying papers containing unoriginal material.

A Note About The Use Of Generative Artificial Intelligence

Generative AI (**GenAI**) tools, such as ChatGPT, are powerful resources that can enhance learning, critical thinking, and problem-solving in engineering management. In this course, students are permitted to use GenAI tools ethically and responsibly to support their coursework, but not to replace critical thinking or domain knowledge. Students need to maintain domain knowledge and critical thinking skills to be able to evaluate the output provided to them from the GenAI tool they are using, as ultimately the student is responsible for the output from the GenAI tool that they are including in their course assignments. If permitted by the faculty member to use GenAI in the course, students must adhere to the following guidelines:

1. **Transparency & Attribution:** If students use GenAI to generate content for assignments, projects, or discussions, they have to clearly disclose its use and cite the tool appropriately. Please make sure to look up how to cite content from GenAI tools.
2. **Academic Integrity:** Submitting AI-generated work as your own without meaningful engagement, critical evaluation, or modification violates academic integrity policies. AI should assist your work, not replace original thought. GenAI should be used in a supportive and collaborative manner only, but it is not meant to replace the student developing a problem-solving thought process.
3. **Verification of output provided by the GenAI tool:** AI-generated content may contain inaccuracies. Students should always fact-check and critically evaluate outputs before using them in academic work.
4. **Check extent to which GenAI is permitted to be used:** The GenAI tool may not be allowed to be used for all the assignments – hence the student should make sure to verify with the instructor as to which assignments they can or cannot use it for.

PowerPoint Oral Presentations - Scoring Rubric

*** For Online Submittals Only ***

	Excellent (4)	Good (3)	Adequate (2)	Weak (1)
RESPONSE TO ASSIGNMENT: PowerPoint presentations are expected to completely address the topic and requirements set forth in the assignment, whereby the contents are very appropriate for the intended audience.	The presentation responds to the assignment and addresses the topic and all requirements, at an appropriate technical level for the intended audience.	The presentation responds to the assignment and addresses the topic, but has minor weaknesses with respect to some of the requirements and/or appropriate technical level.	The presentation responds to the assignment and addresses the topic, but has significant weaknesses with respect to some of the requirements and/or appropriate technical level.	The presentation does not respond to many of the requirements of the assignment, and/or is poorly-tailored for the intended audience.
ANALYSIS & DISCUSSION: PowerPoint presentations are expected to provide an appropriate level of analysis, discussion and evaluation as required and targeted by the assignment.	Presented material is completely analyzed and evaluated, providing support for the main points with validated reasoning, discussion of alternatives, explanations, and examples as appropriate.	Presented material is analyzed and evaluated and appropriate reasons, discussion of alternatives, explanations, and examples are given for most of the main points.	Presented material is analyzed and evaluated at a reasonable level but is not used effectively to support many of the main points.	The depth of analysis and evaluation of the presented material is not sufficient, and the discussion contains unnecessary or trivial material.
ORGANIZATION: PowerPoint presentations are expected to be well-organized in overall structure, beginning with a clear statement of the problem and ending with a clear conclusion and recommendations if applicable.	The presentation is well-structured; its organization contributes to its purpose. The problem is clearly stated and technical content is well-ordered for clarity in delivery.	The presentation is generally well-structured, with only a few flaws in overall organization.	The presentation has a defined structure, but the organization is not optimal for supporting the presentation's content.	The presentation is poorly-structured; organizational flaws undermine its effectiveness and clarity.
STYLE/Form & Format: PowerPoint presentations are expected to be stylistically effective – that is, to consist of visual aids with well-chosen words and graphics which complement the primary objective of the assigned project.	The visual aids (e.g. PowerPoint slides) are informative, well-designed and easy to read. The number of slides is consistent with the expected and accepted range.	The visual aids are informative and generally supportive of the presentation, but could be improved to more effectively complement the project's objectives.	The visual aids are generally supportive of the presentation, but some of them are difficult to read, too busy, and/or not necessary	Visual aids are not designed to effectively to convey the information desired by the target market and audience.
FILE PACKAGING & CONTENT DELIVERY SKILLS: PowerPoint presentations are expected to use an effective narration/writing style which exhibits enthusiasm, generates interest in the audience, and communicates all of the intended and desired information.	The slides are professionally-prepared while aiming to establish a concentrated connection with, and follow-up by, the targeted audience.	The presentation is well-prepared with the desired contents along with good visual aids, but may occasionally stray from topic and/or have other deficiencies in the layout.	The presentation is reasonably-prepared but noticeably weak at the provided visuals, thus not able to communicate all of the intended information.	The inability to present valued research and offer proper analysis, is quite apparent throughout the file/study preparation.
CONCLUSIONS: PowerPoint presentations are expected to draw appropriate conclusions and recommendations based on merited facts.	Key points are clearly re-stated at the end so that the audience clearly understands the purpose of the technical work.	The presentation has a conclusion but some of the key points are not highlighted effectively.	The presentation has a brief conclusion but is not substantial in content.	The presentation package just seems to end abruptly without offering a coherent summation for the intended audience and/or target market.

For Your Information: Grade Evaluation Criterion

* 'A' grade range (A to A-) is reserved for work that is exceptional. This means that it (1) is professional and reflects the writer's/s' careful consideration of audience and purpose; (2) shows perfect to near-perfect understanding of the necessary concepts and analytical tasks; (3) where appropriate, it shows the capacity to think creatively or to see implications beyond the immediate scope of the question; (4) contains all necessary information (invention); (5) is arranged in a logical manner (6), is memorable; (7) delivery is visually appealing; and (8) is free of mechanical errors and is formatted as specified. Work must be flawless to attain an A/A-. Work with minor flaws that is nonetheless excellent in other ways will earn an A-.

* A grade in the B range means that the work is acceptable at the graduate level (B- range) to very good (B/B+). This work satisfies all (B+) or most (B/B-) of the requirements of the question & research tasks, shows the capability to think beyond the task by relating it to other areas of knowledge in or outside of the course; is neatly presented and shows above-average use of academic English. If the work is decently written, is formatted basically correctly, and covers most of the required content, but has several minor flaws or one major flaw, the grade is B-.

* A grade in the C range means that the work, while covering much of the required ground, does not show graduate-level analytic and expressive ability. That is, major and minor items may be missing or incorrect; and while the language may communicate most points adequately, it does not qualify as above-average academic work.

* A grade in the D range shows that the work does not, overall, achieve an acceptable level of coverage of the requirements AND/OR the language is insufficient to make the writer's points understandable to the reader. The content may be either incorrect to an unacceptable degree, or very incomplete.

* A grade of F indicates that so little of the required content is covered that grading the paper is an exercise in futility. It may mean that very major points have clearly not been grasped or have been misunderstood by the student. An F may also indicate that the ideas are expressed in such a way that they are not at all understandable to the reader. A grade of F is also awarded when assigned work is not handed in, or not handed in by the set deadline.