Department of Physics and Engineering

EGR 4072-1 – Senior Project I

2 Units

Fall 2024

Meeting days/times: Wednesdays, 6:00-7:50 PM

Meeting location: Rohr Science (RS) 365

Final Exam: <u>TBD</u>[1]

Instructor title and name:	Professor Jon Viducich, P.E.
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Email:	jviducic@pointloma.edu
Office location and hours:	Via Zoom, by appt. (Please email the instructor to schedule.)

PLNU Mission

To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Physics and Engineering Department Mission

The Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a collaborative learning environment which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christian environment for students to learn values and judgment and pursue integration of modern scientific knowledge and Christian faith.

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[1] Please note that the final exam will *not* take place during the university-scheduled final exam date/time for this course, due to the need to facilitate program requirements for faculty and community member attendance. I will confirm a substitute date/time with students and faculty during the first week of class and an updated version of this syllabus with the final date/time and location will be posted in Canvas.

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Course Description

This course provides students (teams) with the opportunity to design and build a prototype of a project. The students will give an oral presentation of their project in a design review setting. This course will normally be completed in a student's senior year.

Program and Course Learning Outcomes

As part of this course, students will:
1. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Explore ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts.
3. Effectively manage time to complete project deliverables on schedule.
4. Communicate effectively with a range of audiences.
5. Gain experience with the peer-review process.

Course Credit Hour Information

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 2-unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated minimum 75 total hours meeting the course learning outcomes.

Assessment and Grading

This course seeks to prepare students for their engineering careers through self-directed, project-based learning, with an emphasis on professionalism. By completing an engineering design project with minimal oversight, students will continue to develop the skills they will need to be successful in a professional setting. As such, assigned grades will reflect the approximate quality, completeness, and timeliness of deliverables expected of an entry-level, junior engineer. Graded project deliverables include the following:

- **Project Proposal:** At the start of the term, the class will prepare a combined project proposal for the first semester of the year-long design project, including a list of milestones and associated timeline. The draft proposal will be peer-reviewed during class time and feedback must be incorporated in the final version. By formally defining the project's scope of work and schedule, this document will help students set appropriate goals and evaluate their progress throughout the term. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions.

- **Progress Reports:** Each project team will prepare a written, formal progress report, due Week 8 of the term. Class time will be given for peer review of the draft progress reports. The progress reports will give students an opportunity to formally evaluate and present their progress, practice their technical writing skills, and become familiar with a tool frequently used in industry. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions, and the two teams' progress reports will be graded independently.
- **Final Report:** The class will prepare a publication-quality report, due on the last day of the regular term, describing the work completed during the term. The draft-final report sections will be peer-reviewed during class time and feedback must be incorporated in the final version. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions and the comment responses.
- **Final Presentation:** The class will present the work completed during the term during the final exam session. Each project team will be responsible for presenting their work as part of the single presentation. Students will have an opportunity to practice the final presentation in class during the last week of the regular term and receive feedback, though only the final presentation will be graded. The presentations will be open to PLNU students, faculty, and professional community members to attend. Grading for the assignment will be based on formal evaluation of both the presentation visuals (e.g., slides) and oral delivery, including appropriate responses to audience questions.

The assignment grading distribution will be as follows:

Graded Component	Base Points Possible
Project Proposal	25
Progress Report	20
Final Report	30
Final Presentation	25
Total	**100**

Project deliverables will be submitted and graded on a group basis, meaning that students will receive the same base score for group assignments. While this is intended to reflect the realities of both industry and academia, I understand that students make varied contributions to the course and deliverables, and at the end of the semester I will compute a Course Participation Factor for each student. This factor, ranging from 0.9 to 1.1, is intended to recognize the individual contribution of each student to both the classroom environment and the delivered products throughout the term, and will be

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determined based on peer evaluations, a faculty mentor evaluation, a professor evaluation, and an individual technical writing evaluation. The base score for each assignment will then be multiplied by each student's Course Participation Factor to compute the four final assignment scores for each student.

Students are expected to arrive on time and prepared for class sessions and planned team meetings outside of class. Most weeks, class sessions will include a brief, informal oral progress report by each project team to describe progress made and to solicit feedback from the instructor and peers. Some weeks, class time will be dedicated to peer review of draft documents (e.g., proposals, reports, etc.). Students are expected to support each other in the learning process by asking thoughtful questions and providing constructive and respectful written and oral feedback during class sessions. Outside of class, teams are expected to meet weekly with the Faculty Mentor, Dr. José Manjarrés, who is available as a resource to provide project support. Teams are expected to develop and commit to a team contract outlining expectations for all members, then honor those commitments throughout the semester. Please note that all activities contributing to the Course Participation Factor are designed to directly benefit students by supporting them in the on-time delivery of excellent projects.

Final grades will be assigned based on the number of points accumulated throughout the course as a percentage of the total points possible. The percentage ranges required to obtain a given grade are:

Standard Grade Scale Based on Percentages				
	A	B	C	D	F
+		87.5-90	77.5-80	67.5-70	
	92.5-100	82.5-87.5	72.5-77.5	62.5-67.5	0-60
_	90-92.5	80-82.5	70-72.5	60-62.5	

Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. Given the need to facilitate faculty and community member attendance for program requirements, any students with concerns about the scheduled final examination time must contact the instructor during the first week of the term. Unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

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Content Warning

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In Senior Project I, all of the class content, including that which may be intellectually or emotionally challenging, has been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. If you encounter a topic or assignment that is intellectually or emotionally challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to me or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual and professional engagement, and I will support you throughout your learning in this course.

Incompletes and Late Assignments

All assignments are to be submitted by the due dates. Assignments will be considered late if submitted after the indicated due date and time. Late assignments will receive a grade of 0, except in extremely unusual circumstances and at the instructor's discretion. Note: If, due to extreme circumstances, students foresee that they will not be able to submit an assignment on time, they must inform the instructor and discuss options as early as possible. Extensions will not be considered when failure to meet a deadline is coupled with poor communication.

PLNU Attendance and Participation Policy

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement, and *the ability to arrive on time is a critical professional skill*. While tardiness is sometimes unavoidable, please note that repeated tardiness will have a direct and measurable impact on your Course Participation Factor and overall class grade. If a student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university withdrawal date or, after that date, receive an "F" grade.

Spiritual Care

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If students have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the Office of Spiritual Life and Formation.

State Authorization

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma

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Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on State Authorization to view which states allow online (distance education) outside of California.

PLNU Copyright Policy

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Recording Notification

In order to enhance the learning experience, please be advised that this course may be recorded by the professor for educational purposes, and access to these recordings will be limited to enrolled students and authorized personnel.

Note that all recordings are subject to copyright protection. Any unauthorized distribution or publication of these recordings without written approval from the University (refer to the Dean) is strictly prohibited.

PLNU Academic Honesty Policy

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. For all student appeals, faculty and students should follow the procedures outlined in the University Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

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PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. The EAC makes accommodations available to professors at the student's request.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any special accommodations.

Language and Belonging

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good technical writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

If you (or someone you know) have experienced a bias incident regarding language, you can find more information on reporting and resources at www.pointloma.edu/bias.

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Sexual Misconduct and Discrimination

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix.

If you (or someone you know) have experienced other forms of discrimination or bias, you can find more information on reporting and resources at www.pointloma.edu/bias

Loma Writing Center

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

Getting feedback from the Loma Writing Center while you're in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar and polishing final drafts, and more. For information about how to make in-person or online appointments, see Loma Writing Center webpage or visit the Loma Writer Center on the first floor of the Ryan Library, room 221.

- Appointment Calendar: https://plnu.mywconline.com/
- Website: https://www.pointloma.edu/centers-institutes/loma-writing-center
- Email: writingcenter@pointloma.edu

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Tentative Course Schedule

Please note the schedule is subject to minor changes throughout the semester; refer to the Canvas course home page for the updated schedule.

Week	Date	In Class	Mini-lecture Topic	Items Due	Milestone
1	9/4/2024	Introductions, syllabus, project overview, teams/contracts	Engineering Design Process	Entrance survey (by Sept. 6) and team contract (by Sept. 11)	Teams formed, project introduced
2	9/11/2024	Work on proposal/discuss with professor and peers	Project Proposals		Key questions identified, lit review started
3	9/18/2024	Peer review, edit, and combine proposal sections	Task Management Tools	Draft proposal sections (before class)	Lit. review complete, approaches determined
4	9/25/2024	Present proposal and timeline	Design for Manufacturing	Proposal (before class)	Proposal submitted to AgInno for feedback
5	10/2/2024	Work on project/discuss with professor and peers			
6	10/9/2024	Work on project/discuss with professor and peers	Progress Reports		Heat flow numerical model functional
7	10/16/2024	Peer review progress reports	Presentation Skills	Draft progress report (before class)	
8	10/23/2024	Present progress reports		Progress report (before class)	Parts orders approved
9	10/30/2024	Work on project/discuss with professor and peers	Technical Writing/Engineering Reports		Initial design complete, construction started
10	11/6/2024	Work on project/discuss with professor and peers			Report outlined, writing sections
11	11/13/2024	Work on project/discuss with professor and peers	Data Analysis Techniques		
12	11/20/2024	Work on project/discuss with professor and peers			
13	11/27/2024	Thanksgiving (No Class)			
14	12/4/2024	Peer review report sections		Draft report sections (before class)	
15	12/11/2024	Practice presentation with peer feedback		Final report (end of week)	Prototype complete, start collecting data
16	TBD	Final presentation (final exam session) - Time and place TBD		Presentation slides (end of class)	