



Physics and Engineering  
School of STEM

## EGR 1003/1003L – Introduction to Engineering I

Number of Units: 2+1

*Fall 2024*

**Meeting days/times**  
**(Lecture: R 1:30 pm – 3:15 pm)**  
**(Lab: T 12:00pm – 2:50pm)**

**Meeting location (Rohr Science (RS) 295)**

**Final Exam: (Fri, 12/19, 1:30 – 4:00 pm)**

INFORMATION	SPECIFICS FOR THE COURSE
Instructor title and name:	Dr. Anthony Cortez
Phone:	(619) 849-2439
Email:	<a href="mailto:AnthonyCortez@pointloma.edu">AnthonyCortez@pointloma.edu</a>
Office location and hours:	Office Hours: By Appointment <a href="#">Book a time here</a>  Location: Rohr Science 282

### 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.

## Course Description

EGR 1003 Introduction to Engineering I (2 Units)

An introduction to engineering as a career, including problem solving, engineering disciplines, design, teamwork, and communication. Introduction to multiple tools/techniques used by engineers, including data analysis, numerical methods, error analysis, and the use of computers for solving problems in physics and engineering.

Letter grade.

Corequisite(s): [EGR 1003L](#) and [MTH 1033](#) (or equivalent).

EGR 1003L Introduction to Engineering I Lab (1 Unit)

Laboratory to compliment [EGR 1003](#).

Meets three hours per week. Letter grade.

Corequisite(s): [EGR 1003](#)

## Program and Course Learning Outcomes

Through this course students develop skills so they will be able to:

1. Understand the basics of the engineering profession, including problem solving, design, teamwork, and creativity.
2. Develop skills in communicating complex and technical ideas.
3. Understand key ideas of how to use Excel as a tool to solve problems and communicate data in science and engineering.
4. Become proficient at using MATLAB, including writing .m files and correcting or modifying existing code.
5. Learn fundamental skills for group collaboration, as well as lab and project execution/documentation/demonstrations.
6. Address the role that artificial intelligence has in engineering.
7. Understand how to utilize a microcontroller to solve certain engineering problems.

## STUDENT OUTCOMES ADDRESSED

Students will have:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (LO1)

2. An ability to 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. (LO2)
3. An ability to communicate effectively with a range of audiences. (LO3)

### Required Texts and Recommended Study Resources

1. *Access to MATLAB*
2. *Access to Excel*
3. *Arduino Kit*

### 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+1 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 112.5 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

### Assessment and Grading

Grades will be based on the following:

- **Homework/Assignments:** There will be assigned Homework/Assignments to keep you on track with the MiniProjects. Some of these will be submitted as a team and some will be submitted individually.
- **Mini Projects:** You will be completing a mini project for each new tool/technique we are learning in class. This will be completed in the lab scheduled time.
- **Pre-Class:** It is important to come prepared to class. There will be assigned pre-class assignments related to the class content to be covered that are due the day before each lecture.
- **Team Project:** The class will culminate with a Team Project where you will combine the techniques/tools you learned from lecture to complete a project. This project will then be presented to the class.
- **Examinations and the Final Examination.** Examinations and the Final Examination will include problems and questions over material assigned in the text, readings and handouts, as well as material presented in class. No examination shall be missed without prior consent or a well-documented emergency beyond your control. A score of zero will be assigned for an examination that is missed without prior consent or a well-documented emergency beyond your control. The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

<b>Grading Distribution</b>	<b>Percent</b>
Team Final Project	30
Mini Projects	25
Exams	20
Homework/Assignments	20
Pre-class	5
Total	100

### **Sample Standard Grade Scale Based on Percentages**

<b>Standard Grade Scale Based on Percentages</b>					
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
+		87.5- 89.5	77.5-79.5	67.5-69.5	
	91 -100	81-87.5	71-77.5	61 -67.5	0-57
-	89.5-91	79.5-81	69.5-71	57-61	

### **Final Examination Policy**

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Traditional Undergraduate Records: Final Exam Schedules](#) site. 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. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

## **Incompletes and Late Assignments**

All assignments are to be submitted by the due dates. Assignments will be considered late if posted after the due date and time using Pacific Standard Time. Late assignments will receive a grade of 0.

## **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 you 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 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 in reality 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, 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.

### **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](mailto: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.

### **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](http://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](mailto:counselingservices@pointloma.edu) or find a list of campus pastors at [pointloma.edu/title-ix](http://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](http://www.pointloma.edu/bias)

### **PLNU Attendance and Participation Policy**

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the 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.

### **Tentative Schedule (Subject to Updates)**

<b>Date</b>	<b>Topic</b>	<b>Reading</b>
(WEEK 1) 3-Sep	Lab 1 – Explore Engineering Careers	
5-Sep	Intro/Engineer	
(WEEK 2) 10-Sep	Lab 2 – Think like an Engineer	
12-Sep	Excel I	
(WEEK 3) 17-Sep	Lab 3 – Excel I	
19-Sep	Excel II	
(WEEK 4) 24-Sep	Lab 4 – Excel II	
26-Sep	Matlab I - .m files	
(WEEK 5) 1-Oct	Lab 5 – Matlab I	
3-Oct	Matlab II – Matrix Applications	
(WEEK 6) 8-Oct	Lab 6 – Matlab II	

10-Oct	Matlab III - Plotting	
(WEEK 7) 15-Oct	Lab 7 – Matlab III	
17-Oct	Exam 1 Theory	
(WEEK 8) 22-Oct	Exam 1 Lab Application	
24-Oct	Fall Break – No Class	
(WEEK 9) 29-Oct	Lab 8 – Open Lab	
31-Oct	Artificial Intelligence I	
(WEEK 10) 5-Nov	Lab 9 - Spooky AI	
7-Nov	Discuss Spooky AI	
(WEEK 11) 12-Nov	AI as a Tool	
14-Nov	Arduino I	
(WEEK 12) 19-Nov	Lab 10 – Arduino I	
21-Nov	Arduino II	
(Week 13) 26-Nov	Lab 11 – Arduino II	
(WEEK 14) 3-Dec	Lab 12 – Final Project Proposal	
5-Dec	Final Project	
(WEEK 15) 10-Dec	Final Project	
12-Dec	Final Project	
19-Dec	Final Presentation	