POINT 1902 LOMA
NAZARENE UNIVERSITY

Department/School Name:
Physics and Engineering

Course Number and Name:
EGR 1012/1012L – Introduction to Engineering I

Number of Units: 1+1

Fall 2023

Meeting days/times
Lecture: (R 1:30 pm – 2:25 pm)
Lab: (T 5:15 pm – 8:05pm)

Meeting location
Lecture: (Rohr Science Hall 365 (RS 365))
Lab: (Rohr Science Hall 265 (RS 265))

Final Exam: (Tuesday, 12/12, 1:30 – 4:00 pm)

Instructor title and name:	Dr. Anthony Cortez Prof. Joey Tuttobene
Phone:	Dr. Cortez: (619) 849-2439
Email:	AnthonyCortez@pointloma.edu JosephTuttobene@pointloma.edu
Office location and hours:	Office Hours: MW: 12:00pm – 1:00pm R: 9:00am – 10:00am and 2:30pm – 4:00pm By Appointment 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.

Department Mission

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Course Description

EGR 1012 Introduction to Engineering I (1 Unit):

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.

Corequisite(s): EGR 1012L and MTH 1033 (or equivalent).

EGR 1012L Introduction to Engineering I Lab (1 Unit):

Laboratory to compliment EGR 1012.

Meets three hours per week.
Corequisite(s): EGR 1012

Program and Course Learning Outcomes

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.

Program Learning Outcomes
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)
4. An ability to 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. (LO4)
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (LO7)

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 1+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 175 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

Rev 06.16.23

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.

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

Rev 06.16.23

Standard Grade Scale Based on Percentages					
	A	**B**	**C**	**D**	**F**
+		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 Class 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 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 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 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. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. 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 issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

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 and/or if they do not wish to utilize some or all of the elements of their AP in that course.

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.

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.

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 drop date or, after that date, receive an "F" grade.

Tentative Schedule (Subject to Updates)

Date	Topic	Reading	HW Due
29-Aug (WEEK 1)	Lab 1 – Explore Engineering Careers		
31-Aug	Intro/Engineer		
5-Sep (WEEK 2)	Lab 2 – Think like an Engineer		
7-Sep	Excel I		
12-Sep (WEEK 3)	Lab 3 – Excel I		
14-Sep	Excel II		
19-Sep (WEEK 4)	Lab 4 – Excel II		
21-Sep	Matlab I - .m files		
26-Sep (WEEK 5)	Lab 5 – Matlab I		

28-Sep	Matlab II – Matrix Applications		
3-Oct (WEEK 6)	Lab 6 – Matlab II		
5-Oct	Matlab III - Plotting		
10-Oct (WEEK 7)	Lab 7 – Matlab III		
12-Oct	Exam 1 Theory		
17-Oct (WEEK 8)	Exam 1 Lab Application		
19-Oct	Fall Break Day – No Class		
24-Oct (WEEK 9)	Lab 8 – Open Lab		
26-Oct	Artificial Intelligence I		
31-Oct (WEEK 10)	Lab 9 - Spooky AI		
2-Nov	Discuss Spooky AI		
7-Nov (WEEK 11)	AI as a Tool		
9-Nov	Arduino I		
14-Nov (WEEK 12)	Lab 10 – Arduino I		
16-Nov	Arduino II		
21-Nov (WEEK 13)	Lab 11 – Arduino II		
22-24-Nov	Thanksgiving Break – No Class		
28-Nov (WEEK 14)	Lab 12 – Final Project Proposal		
30-Nov	Final Project		
5-Dec (WEEK 15)	Final Project		
7-Dec	Final Project		
12-Dec	Final Project Presentation		