POINT 19 02 LOMA NAZARENE UNIVERSITY	**Department/School Name: Physics and Engineering** **Course Number and Name:** **EGR 2014/2014L – Engineering Mechanics: Statics and Lab** **Number of Units: 3 + 1**
Spring 2023	

Meeting Days: **(Lecture) MWF** **(Lab) R**	**Professor: Dr. Anthony Cortez**
Meeting Times: **(Lecture) 11:00 am - 11:55 am** **(Lab) 10:00 am – 11:45 am**	**Phone: (619) 849-2439**
Meeting Location: Rohr Science 265	**Email: AnthonyCortez@pointloma.edu**
Final Exam: **Mon. 3-May 10:30am**	**Office hours:** **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 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 2014 – Engineering Mechanics: Statics (3)

Statics of particles and rigid bodies as applied to engineering design. Topics include vector algebra, forces, moments and couples, conditions of equilibrium, friction, and virtual work.

Prerequisite(s): PHY 2044 with a grade of C- or higher.
Corequisite(s): EGR 2014L

EGR 2014L – Engineering Mechanics: Statics Lab (1)

A lab course designed for a hands-on exploration of Engineering Mechanics. Meets two hours per week.

Prerequisite(s): PHY 2044 with a grade of C- or higher.
Corequisite(s): EGR 2014

COURSE LEARNING OUTCOMES

1. Gain a fundamental understanding of Engineering Mechanics.
2. Accurately identify forces and moments on a real world system.
3. Accurately draw a free-body diagram in 2D and 3D.
4. Accurately arrive at the equations of equilibrium of a system in 2D and 3D.
5. Develop written communication skills through detailed procedures in labs.
6. Apply knowledge from course material to successfully set up experimental equipment and effectively carry out lab procedures.
7. Effectively collaborate in teams.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

Engineering Mechanics: Statics by Hibbeler, Russell C. – 14th Edition

NOTE: Students are responsible to have the required textbooks prior to the first day of class. Students are also encouraged to begin reading the books in preparation for the class as soon as possible.

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 3+1 unit class delivered over fifteen 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 150 total hours meeting the course learning outcomes.

Class Enrollment

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

ASSESSMENT AND GRADING

Graded Components

- **Homework**: Homework will be assigned weekly and is due at the start of class the following week.
- **Labs**: Labs will provide hands on applications of the engineering mechanics we are learning in lecture. Each lab you will be generating a document of procedures to submit at the end of the scheduled lab time. A detailed lab report will be submitted the following week. The labs are designed to enhance your understanding of the course material with hands on materials, communicate your understanding in writing, and efficiently work in small teams.
- **Pre-Class Reading Questions**: There will be assigned reading prior to the start of select lectures. It is expected that you read the assigned section prior to the start of class. A quiz will be given for selected days throughout the reading schedule.
- **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. Only your two highest exam scores (not including the final) will be included in the calculation of your grade. You must take all three exams in order to drop the lowest score, otherwise all three exams will be used in the calculation of your grade. 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
Exams (Lowest Score Dropped)	30
Final Exam	25
Homework	20
Labs	20
Pre-Class Reading Questions	5
Total	100

Grading Scale

Grades are based on the number of points accumulated throughout the course with the following exception. Approximate minimal percentages required to obtain a given grade are:

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	

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.

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.

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 ADC Academic and General PoliciesLinks to an external site. 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.

PLNU 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 the Office of Spiritual Development Links to an external site.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Attendance is expected at each class session. In the event of an absence, you are responsible for the material covered in class and the assignments given that day. 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 the appropriate grade for their work and participation.

PLNU USE OF TECHNOLOGY

In order to be successful in the online environment, students need to meet the minimum technology and system requirements; please refer to the Technology and System Requirements Links to an external site.information. If a student is in need of technological resources please contact student-tech-request@pointloma.edu

Problems with technology do not relieve students of the responsibility of participating, turning in assignments, or completing class work.

TENTATIVE SCHEDULE (Subject to Updates)

Date	Topic	Reading	HW Due
10-Jan (WEEK 1)	Introductions and Unit Analysis	Ch.1	
11-Jan	Vector Operations	2.1-2.2	
13-Jan	Vector Addition and Cartesian Vectors	2.3-2.4	
16-Jan (WEEK 2)	MLK Day NO CLASS		
18-Jan	3D Cartesian Vectors and Addition	2.5-2.6	
20-Jan	Position Vectors and Dot Product	2.7-2.9	HW 1
23-Jan (WEEK 3)	Free-Body Diagram and Coplanar Forces	3.1-3.3	
25-Jan	3D Force Systems	3.4	
27-Jan	Moment of a Force	4.1	HW 2
30-Jan (WEEK 4)	Moment of a Force Vector	4.2-4.4	

1-Feb	Moment of a Force about an Axis	4.5	
3-Feb	Moment of a Couple	4.6	HW 3
6-Feb (WEEK 5)	Exam 1		
8-Feb	Simplification of a Force and Couple System	4.7-4.8	
10-Feb	Reduction of a Simple Distributed Loading	4.9	HW 4
13-Feb (WEEK 6)	Equilibrium and FBD of a Rigid Body	5.1-5.2	
15-Feb	Equations of Equilibrium	5.3	
17-Feb	Two and Three Force Membranes	5.4	HW 5
20-Feb (WEEK 7)	Equilibrium in 3D	5.5-5.7	
22-Feb	Simple Trusses	6.1-6.2	
24-Feb	Zero-Force Members	6.3	HW 6
27-Feb (WEEK 8)	The Method of Sections	6.4	
1-Mar	Frames and Machines	6.6	
3-Mar	Exam 2		HW 7
6-10 Mar	Spring Break NO CLASSES		
13-Mar (WEEK 9)	Frames and Machines cont.	6.6	
15-Mar	Internal Forces	7.1	
17-Mar	Shear and Moment	7.2	HW 8
20-Mar (WEEK 10)	Distributed Load, Shear, and Moment	7.3	
22-Mar	Dry Friction	8.1	
24-Mar	Dry Friction Continued	8.1-8.2	HW 9
27-Mar (WEEK 11)	Wedges	8.3	
29-Mar	Frictional Forces on Screws	8.4	
31-Mar	Frictional Forces on Flat Belts	8.5	HW 10

3-Apr (WEEK 12)	Rolling Resistance	8.8	
5-Apr	Exam 3		
6-10 Apr	Easter Recess – NO CLASSES		
12-Apr (WEEK 13)	Friction Applications Cont.	Ch.8	
14-Apr	Centroid of a Body	9.1	HW 11
17-Apr (WEEK 14)	Centroid of a Body cont.	9.1-9.2	
19-Apr	Composite Bodies	9.2	
21-Apr	Moments of Inertia	10.1-10.3	HW 12
24-Apr (WEEK 15)	Moments of Inertia for Composite Areas	10.4	
26-Apr	Catch Up		
28-Apr	Review		HW 13
3-May	Final Exam @ 10:30am		