Syllabus

To-Do Date: Aug 17 at 11:59pm

POINT LOMA NAZARENE UNIVERSITY	**Department of Physics and Engineering** **PHY3034/3034L Mechanics of Materials** **3 +1 Units**
Fall 2020 | August 17- December 4	

Instructor: Michelle Chen
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Office hours: By Appointment in Zoom

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

Theory and analysis of forces, stress, and strain within engineering structural elements and members. Topics include the theory of stress and strain, elastic and plastic deformation, modes of structural failure, compression and tension, torsion, shear, shafts, beams, posts, transformations of stress and strain. Prerequisite(s): PHY2044 with grade C- or higher. Corequisite(s): EGR 3034L.

FOUNDATIONAL EXPLORATION

PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and cultures.

COURSE LEARNING OUTCOMES

This course supports the overall learning objectives of the physics and engineering programs in building your ability: (1) to develop an understanding of the fundamental principles of physics and of engineering (LO1), (2) to apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems (LO2), (3) to design and conduct experiments or complete an engineering design project as well as analyze and interpret data (LO3), and (4) to effectively collaborate in teams (LO6).

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

1. Textbook: Mechanics of Materials, by R. C. Hibbeler, 10th Edition
2. Homework: Access from "MyLab and Mastering" tab on CANVAS
   Course name: EGR3034 -- Mechanics of Materials -- Fall 2020
   Course ID: chen45887
3. A calculator

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 4 unit class delivered over sixteen weeks. Specific

details about how the class meets the credit hour requirement can be provided upon request. (Based on 37.5 hours of student engagement per credit hour.)

Distribution of Student Learning Hours

Category	Time Expectation in Hours
Labs	42
Reading/Online Video Assignments	39
Homework Assignments	54
Other Assignments & Learning Activities	11
Exams	4
Total Hours	150

ASSESSMENT AND GRADING

Graded Components

- **Lab:** Provides hands on applications of the concepts we are learning in class. There is a focus on conceptual understanding as well as data collection and analysis. For each lab you will be submitting an electronic lab report to the canvas site. The labs this semester are designed with flexibility to collect data and explore simulations individually and then discuss and fix trouble spots in small groups.
- **Homework**: Access MasteringEngineering from the blue "MyLab and Mastering" tab on the left column of CANVAS. Practicing working problems is critical to your success in the class. Each week there will be homework set due through MasteringEngineering.
- **Videos and Questions**: Each week will have videos to watch and corresponding questions that you answer.
- **Synchronous Zoom:** According to University policy, synchronous Zoom meetings are required for each class. Therefore we will be taking attendance for our once-a-week Zoom sessions. During Zoom we will go over some important concepts and examples, and you will have your questions answered, and connect with your classmates. One is allowed up to 6 missed Synchronous Zoom sessions before starting to lose attendance points.
- **Examinations:** Examinations and the final examination will include problems and questions over material assigned in the text, videos, homework, and 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.

- **Final Examination:** Final exam will in the form of a final design project that requires you to integrate the knowledge that you learned through the semester. You will submit your work electronically on CANVAS.
- **Late work will not be accepted** without prior consent or a well-documented emergency. Up to a maximum of one homework assignment will be accepted up to 3 days late provided that consent is received from the professor before it is due. Homework assignments that are submitted late without prior consent will be recorded with a score of zero. If more than half of the homework assignments are submitted on time, then the lowest homework score will be dropped from the calculations of the homework grade.
- The examination schedule is included in the schedule and will be followed.

Grading Distribution	**Percent**
Exams	30
Final Exam	20
Labs	25
Homework	20
Video Questions	3
Synchronous Zoom	2
Total	100

Grading Scale

.Approximate minimal percentages 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

Standard Grade Scale Based on Percentages					
	A	**B**	**C**	**D**	**F**
_	90-92.5	80-82.5	70-72.5	60-62.5	

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

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 (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (**DRC@pointloma.edu (mailto:DRC@pointloma.edu)** or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and

activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

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 classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in 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. See **Academic Policies (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278)** for further information about class attendance.

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 (https://www.pointloma.edu/offices/spiritual-development)**

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 (https://www.pointloma.edu/offices/office-institutional-effectiveness-research/disclosures)** to view which states allow online (distance education) outside of California.

		Topics
8/17 - 8/21	Week 1	Introductions & Stress (Ch 1)
8/24 - 8/28	Week 2	Stress (Ch 1)
8/31 - 9/04	Week 3	Strain (Ch 2)
9/07 - 9/11	Week 4	Mechanical Properties of Materials (Ch 3)
9/14 - 9/18	Week 5	Mechanical Properties of Materials (Ch 3)
9/21 - 9/25	Week 6	Axial Load (Ch 4)
9/28 - 10/02	Week 7	Axial Load (Ch 4)
10/05 - 10/09	Week 8	Torsion (Ch 5) / Exam 1
10/12 - 10/16	Week 9	Bending (Ch 6)
10/19 - 10/23	Week 10	Bending (Ch 6), Combination Loadings (Ch 8)
10/26 - 10/30	Week 11	Stress Transformation (Ch 9), Strain Transformation (Ch 10)
11/02 - 11/06	Week 12	Strain Transformation (Ch 10)
11/09 - 11/13	Week 13	Deflection of Beams and Shafts (Ch 12)
11/16 - 11/20	Week 14	Energy Methods (Ch 14)
11/23 - 11/27	Week 15	Exam 2 / Thanksgiving
11/30 - 12/04	Week 16	Final Project Due