Syllabus

To-Do Date: Jan 14 at 11:59pm

POINT LOMA NAZARENE UNIVERSITY	**Department of Mathematical, Computer, and Information Sciences** **MTH 2033 Linear Algebra** **3 Units**
Spring 2022	

	Instructor:	**Email:**	**Phone:**	**Office Hours:**
Section 1: MWF 11:00-11:55 **295 Rohr Science Hall**	Dr. Robert Compton, Ph.D.	rcompton@pointloma.edu	619.849.2341	Posted in Canvas

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

A computational introduction to linear algebra with applications. A study of linear equations, matrix algebra, Euclidean spaces and subspaces, vector spaces, linear transformations, eigenvalues, eigenvectors, and inner products. Linear Algebra is one of the most important areas of mathematics in modern day usage and has many practical applications. This course will give students a basic understanding of some of the most important concepts of Linear Algebra. For this online course, we will be working in groups on some practical application projects.

Prerequisite: Mathematics 1044 or 1064

COURSE LEARNING OUTCOMES

1. Students will be able to apply their mathematical knowledge to solve problems.
2. Students will be able to demonstrate facility with algebraic structures.
3. Students will be able to speak about their work with precision, clarity and organization.
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5. Students will collaborate effectively in teams.
6. Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
7. Students will be able to gather relevant information, examine information and form a conclusion based on that information.

8. Students will be able to understand and create arguments supported by quantitative evidence, and they can clearly communicate those arguments in a variety of formats.

REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES

We will be using the following textbook:

1. Linear Algebra, 5th ed. Lay, David C. 2011. ISBN: 978-0321836144

For additional help, some of my past students have found the Kahn Academy useful: https://www.khanacademy.org/math/linear-algebra

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 unit class delivered over fifteen 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
Video Notes & Activities	(33 at 1 hr. each)	39
Reading Assignments	(39 at 2 hours each)	78
Written Homework	(14 at 4 hours each)	30
Weekly Participation	(15 at 1.25 hours each)	18.75
Literature Review		
Two Examinations	(2 at 1.25 hours each)	2.5
Final Examination		2.5
Total Hours		**122.5**

ASSESSMENT AND GRADING

Graded Components

- **Homework**: Homework will be completed on paper and then photographed and turned in electronically. You may work together but each student is expected to turn in their own work.
- **Notes and Videos**: All online zoom sessions will be recorded and posted. There are some videos from previous semesters to review if you are having trouble. These will not be graded.
- **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.
- **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 daily schedule. This instructor does not intend to accept excuses such as poor communication with parents, benefactors, surf team sponsors and/or travel agents.

Grading Distribution	**Percent**
Two Examinations at 20% each	40
Final Exam	30
Homework/Activities	25
literature Review	5

Total	100

Grading Scale

Grades are based on the number of points accumulated throughout the course with the following exception. A student must pass at least one of Exam 1, Exam 2, or the Final Exam in order to pass the class. That is, a score of 60% must be achieved on one of the Exams, or else the final grade will be an F regardless of all other point totals. 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
–	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.

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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.

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

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 (mailto: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 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.

Spring 2022 Tentative Class Schedule - Subject to Change

Week	Monday	Wednesday	Friday/Saturday
1	1/11 (Tuesday meeting) 1.1 Systems of Linear Equations	1/12 1.2 Row Reduction and Echelon forms	1/14 1.3 Vector Equations
2	1/17 MLK Day – No Class	1/19 1.4 Matrix Equations	1/21 1.5 Solution Sets
3	1/24 1.7 Linear Independence	1/26 1.8 Intro to Linear Transformations	1/28 1.9 Linear Transformations
4	1/31 1.6 Applications	2/2 1.10 Linear Models	2/4 2.1 Matrix Operations
5	2/7 2.2 The Inverse of a Matrix	2/9 2.3 Characteristics of Inverse Matrix	2/11 2.4 Partitioned Matrices
6	2/14 2.5 Matrix Factorizations	2/16 Make up day/Computer Apps	2/19 Review
7	2/21 **EXAM I**	2/23 3.1 Introduction to Determinants	2/26 3.2 Properties of Determinants
8	2/28 4.1 Vector spaces	3/2 4.2 More spaces	3/4 4.3 Bases
	3/7 Spring Break		
9	3/14 4.4 Coordinate Systems	3/16 4.5 Dimension	3/18 4.6 Rank
10	3/21 5.1 Eigenvectors and Eigenvalues	3/23 5.2 The Characteristic Equations	3/25 5.3 Diagonalization
11	3/28 5.4 Eigenvectors -Linear Transforms	3/30 6.1 Inner Product	4/1 Make up day/Applications
12	4/4 Review	4/6 **EXAM II**	4/8 6.2 Orthogonal Sets
13	4/11 6.3 Orthogonal Projections	4/13 6.4 Gram-Schmidt Process	4/15 **Easter Holiday- No Class**
14	4/18 **Easter Holiday- No Class**	4/20 6.5 Least Squares	4/22 Literature Review
15	4/25 7.1 Diagonalization	4/27 7.2 Quadratic Forms	4/30 Final Exam Review
Finals Week	**5/2 10:30 AM – 1 PM** **FINAL EXAM**		

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