

MTH 233 (3 units) Linear Algebra
TTh 9:30-10:45 am RS 14

Instructor: Ryan Botts, Ph.D.
Office Hours: MWF 12:30-2:30
 T 8:30-9:30, 3:30-5,
 Th 8:30-9:30, Others by arrangement

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Mascot: Armadillo

Required Materials

Linear Algebra, 4th ed. Lay, David C. 2011. ISBN: 978-0321836144

Point Loma Nazarene University Mission:

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 becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

MICS 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.

Prerequisite: Mathematics 144 or 164

Course Learning Outcomes

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

Course Philosophy

Mathematics is learned by doing. You will be given many problems to solve both in and out of class. You are encouraged to work with each other and consult the internet, but be sure that the solutions you write up are yours. Exam problems will be similar to these and it will be essential that you know how to do all of the problems from the homework.

Grading Policies

Grading Distribution	Percent
Two Examinations at 20% each	40
Final Exam	30
Homework and Activities	25
Literature Review	5
Total	100

Grading scale

Grading Scale in percentages	A	B	C	D
+		(87.5, 90)	(77.5, 80)	(67.5, 70)
	[92.5, 100]	[82.5, 87.5]	[72.5, 77.5]	[62.5, 67.5]
-	[90, 92.5)	[80, 82.5)	[70, 72.5)	[60, 62.5)

Grade components.

The grade components are homework (text exercises), tests, and the final examination.

- **Late work.** A written assignment or computer assignment is late if it is not received at the beginning of class on the due date. Late work need not be accepted. Work accepted late may be assessed a penalty. Make-up tests will only be given by arrangement with the instructor for reasons of documented emergency.
- **Accuracy of solutions.** Written assignments and examination questions and problems must be formulated carefully in terms of words and symbols used in the course. Credit is determined by the degree to which answers and solutions respond to the specific question or problem stated. Maximize your credit by learning the language and symbols of the course.
- **Written Assignments.** Collected assignments must be prepared in a style suitable for grading. The following guidelines are used to determine credit:
 - the organization must be easy to follow
 - the work must be legible
 - complete solutions must be written for problems (not just answers); answers must be clearly marked
 - use complete sentences to answer questions
- **Literature Reviews** You will be responsible for finding two journal article applying tools from linear algebra and then writing a brief summary to present to the class. Grading details and dates will be provided in 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 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.

Attendance:

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 in which a student is registered is considered essential to optimum academic achievement. Therefore, regular attendance and participation in each course are minimal requirements to be met. There are no allowed or excused absences except as approved in writing by the Provost for specific students participating in certain university-sanctioned activities. Excused absences still count toward the 10%-20% limits, but allow students to make up work, quizzes, or tests missed as a result of a university-sanctioned activity. Activities of a unique nature, such as labs or other activities identified clearly on the syllabus, cannot be made up except in rare instances when instructors have given advanced, written approval for doing so. Whenever the number of accumulated absences in a class, for any cause, exceeds ten (10) percent of the total number of class meetings, the faculty member should send an e-mail to the student and the Vice Provost for Academic Administration (VPAA) warning of attendance jeopardy. If more than twenty (20) percent of the total number of class meetings is reported as missed, the faculty member or VPAA may initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of W or WF consistent with university policy in the Grading section of the catalog. There are no refunds for courses where a de-enrollment was processed. For more details see the PLNU catalog: http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Class_Attendance

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.

Academic Accommodations:

While all students are expected to meet the minimum academic standards for completion of their courses as established by the instructors, students with special needs may require academic accommodations. At Point Loma Nazarene University, students requesting academic accommodations must file documentation with the Disability Resource Center (DRC), located in the Bond Academic Center. Students can also reach the Disability Resource Center by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. Once the student files documentation, the Disability Resource Center contacts the student's instructors and provides written recommendations for reasonable and appropriate accommodations to meet the individual needs of the student. This policy assists the university in its commitment to full compliance with Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities (ADA) Act of 1990, and ADA Amendments Act of 2008, all of which prohibit discrimination against students with special needs and guarantees all qualified students equal access to the benefits of PLNU programs and activities. For more details see the PLNU catalog: http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Accommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty:

The Point Loma Nazarene University community holds the highest standards of honesty and integrity in all aspects of university life. Any violation of the university's commitment is a serious affront to the very nature of Point Loma's mission and purpose. Violations of academic honesty include cheating, plagiarism, falsification, aiding academic dishonesty, and malicious interference. The details of PLNU's meaning of each of these words can be found in the PLNU catalog at: http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty

A student remains responsible for the academic honesty of work submitted in PLNU courses and the consequences of academic dishonesty beyond receipt of the final grade in the class and beyond the awarding

of the diploma. Ignorance of these catalog policies will not be considered a valid excuse or defense. Students may not withdraw from a course as a response to a consequence.

A student who is caught cheating on any item of work will receive a zero on that item and may receive an "F" for the semester. See the PLNU Catalog for a further explanation of the PLNU procedures for academic dishonesty (http://catalog.pointloma.edu/content.php?catoid=18&navoid=1278#Academic_Honesty).

Final Exam: Date and Time:

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. 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 change the exam date and time for that particular student.

Copyright Protected Materials:

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.

Credit Hour:

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for an 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

The Final Exam is 10:30-1:00 Tuesday May 3, 2016 and it is a Comprehensive Examination.

Week	Tuesday	Thursday
1	1/12 No Class	1/14 1.1-1.2 Sys. of Eq. and Row Red
2	1/18 1.3-1.4 Vector and Matrix Eq	1/21 1.5 Solution Sets
3	1/26 1.6 Applications	1/28 1.7 Linear Indep.
4	2/2 1.8 -1.9 Intro to Linear Trans.	2/4 1.10 Linear Models
5	2/9 2.1 Matrix Ops.	2/11 2.2 The INVERSE...
6	2/16 Review	2/18 Exam 1
7	2/23 2.3 Char. Of Inv. Matrices	2/25 2.4 Partitioned Matrices
8	3/1 2.5 Matrix Fact.	3/3 3.1 and 3.2 Determinants
9	3/15 4.1 Vector spaces	3/17 Lit. Review
10	3/22 4.2 More spaces	3/24 Easter Recess
11	3/29 4.3 Bases	3/31 4.4 Coordinate Syst.
12	4/5 Review	4/7 Exam 2
13	4/12 4.5 Dim of a Space	4/14 4.6 Rank
14	4/19 5.1 and 5.2 Eigenvalues	4/21 Lit Review
15	4/26 5.3 Diagonalization	4/28 Review
Finals Week	5/3 Final 10:30-1:00	5/5