

Math 210 Section 5631 - Linear Algebra

Fall 2007

Professor: Dr. Jess Lenarz

Meeting Time: MW 8:30 am - 9:40 am & F 8:00 am - 9:10 am

Meeting Place: Ivers 225

Office: Ivers 234E

Office Hours: MW 10:30-11:40, 2:30-4:00; T 10:30-11:40, 1:20-3:50;
ThF 10:30-11:40; or by discovery or appointment

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Website: <http://www.cord.edu/faculty/lenarz/Math210/F07/index.htm>

Text: *Linear Algebra: A Modern Introduction*, 2nd ed. by David Poole. We will cover through Chapter 6.

Prerequisites: Math 122 (Calculus II) or equivalent.

Course Objectives:

- To understand several important concepts in linear algebra, including
 - systems of linear equations and their solutions
 - matrices and their properties
 - determinants and their properties
 - vector spaces
 - linear independence of vectors
 - subspaces, bases, and dimension of vector spaces
 - linear transformations
 - eigenvalues and eigenvectors
- To apply these concepts to such real world phenomena as networks, coding, and Markov chains
- Acquire the ability to prove mathematical theorems
- To improve the students' ability to think logically, analytically, and abstractly
- To improve the students' ability to communicate mathematics, both orally and in writing
- To prepare the student for courses that have Linear Algebra as a prerequisite.

Grading: Final grades will be determined by the following components:

Component	%	Date
Self-evaluation	5 %	October 17
Instructor-evaluation	5 %	
Boardwork/Participation	0 – 10 %	Every class
HW/Quizzes	20 – 40 %	Every class
Exam 1	10 – 20 %	October 1
Exam 2	10 – 20 %	October 26
Exam 3	10 – 20 %	November 21
Final Exam	10 – 20 %	December 13

For the categories where a range is given, the percentage will be up to each individual student. A form will be distributed to each student to record their choice. After the first exam, the forms must be signed and returned to me. You will not be allowed to change the percentages after that point. At the end of the semester, I will compute grades according to the percentages you have outlined.

Grades will be based on the following scale:

Percentage	Grade	Percentage	Grade
93 – 100	A	73 – 76	C
90 – 92	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83 – 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
77 – 79	C+	0 – 59	F

Self-evaluation: All students will be required to submit a self-evaluation at mid-semester, due Wednesday, October 17. You should communicate what mid-semester grade you should receive and why. I will grade these based on your justification for your grade. This is designed to be an exercise to help you reflect on your performance in class and how you might improve during the remainder of the semester.

Quizzes & Homework: Homework problems for each section will be posted on the website. The assigned problems are due two class periods later. Every class period (except exam days) will begin with a quiz or the collection of homework problems. Late homework will not be accepted. There will be no makeup quizzes. Your three (3) lowest homework grades will be dropped at the end of the semester. Your homework must be neat and well organized. The homework will be graded not only for correctness, but also on neatness, organization, clarity, and the use of correct grammar and complete sentences when applicable. The answers to selected odd-numbered (non-proof type) problems are in the back of the book. I

encourage you to work together outside of class, but you are expected to write up solutions by yourself, in your own words.

Exams: There will be 3 in-class exams given during the course as well as a comprehensive final exam. Each in-class exam will be 70 minutes long. Attendance is required for exams. If you can not attend for some reason, you must contact me BEFORE the exam to schedule a makeup exam. If you are ill the day of the exam, you must give me a doctor's note to schedule a makeup exam.

Calculators: Calculators may be prohibited for certain quizzes or exams. You may use a calculator at any other time, but exams will be written in such a way that a calculator gives no unfair advantage. Please see me if you need help selecting a calculator.

Partial Credit: Partial credit will be awarded. If your final answer is incorrect, but your thought processes were correct in general, you will receive some credit. In a similar manner, if no thought processes are indicated and your answer is correct, you will not receive full credit. YOU MUST ALWAYS SHOW YOUR WORK!

Academic Integrity: All students are expected to follow the policies set forth in the Academic Integrity section of the catalog. Cheating will NOT be tolerated. If you are caught cheating, you will receive a zero for that quiz, exam or assignment.

Special Accommodations: Any student who feels s/he may need an accommodation based on the impact of a disability should see me privately to discuss your specific needs. Please contact Monica Kersting in the Office of Disability Services at 299-3514 in Academy 106 to coordinate reasonable accommodations for students with documented disabilities.

Attendance: Students are expected to attend and participate in class. If you aren't in class, you won't learn anything! If you must miss class due to illness, please call me and let me know. If you must miss class due to a college sponsored activity, please notify me in advance. You may be required to do makeup work for the time you are gone. A general rule of thumb is no more than three absences.

Classroom Behavior: Please respect your fellow classmates. This means not distracting other students during class with ringing cell phones, talking on the phone, talking with your neighbor, etc. I do not mind if you eat or drink during class, just clean up after yourself.

Changes: Components of this syllabus are subject to change. If changes need to be made in the syllabus, students will be involved in the decision process.

Date	Section
Aug. 31	Introductions, Syllabus, and Discussion
Sept. 3	1.1 - Geometry and Algebra of Vectors
Sept. 5	1.2 - Dot Product
Sept. 7	1.3 - Lines and Planes
Sept. 10	Intro to Proof I
Sept. 12	Intro to Proof II
Sept. 14	2.1 - Systems of Linear Equations
Sept. 17	2.2 - Solving Linear Systems
Sept. 19	2.3 - Span and Linear Independence
Sept. 21	Problem/Catch-up Day
Sept. 24	1.4 - Code Vectors
Sept. 26	2.4 - Applications (Networks, Finite Linear Games, Chemical Equations)
Sept. 28	Review
Oct. 1	Exam 1 (Chapters 1 & 2)
Oct. 3	3.1 - Matrix Operations
Oct. 5	3.2 - Matrix Algebra
Oct. 8	3.3 - The Inverse of a Matrix I
Oct. 10	3.3 - The Inverse of a Matrix II
Oct. 12	3.5 - Subspaces, Basis, Dimension and Rank I
Oct. 15	3.5 - Subspaces, Basis, Dimension and Rank II
Oct. 17	3.6 - Linear Transformations
Oct. 19	3.7 - Applications (Markov Chains, Graphs, Error Correcting Codes)
Oct. 22	Midsemester Break
Oct. 24	Review
Oct. 26	Exam 2 (Chapter 3)
Oct. 29	4.1 - Eigenvalues and Eigenvectors
Oct. 31	4.2 - Determinants
Nov. 2	4.3 - Eigenvalues and Eigenvectors
Nov. 5	4.4 - Similarity and Diagonalization
Nov. 7	Problem/Catch-up Day
Nov. 9	5.1 - Orthogonality
Nov. 12	5.2 - Orthogonal Complements and Projections
Nov. 14	5.3 - Gram-Schmidt Process
Nov. 16	6.1 - Vector Spaces and Subspaces
Nov. 19	Review
Nov. 21	Exam 3 (Chapters 4 & 5)
Nov. 23	Thanksgiving Break
Nov. 26	6.2 - Linear Independence, Basis and Dimension
Nov. 28	6.4 - Linear Transformations
Nov. 30	6.5 - Kernel, 1-1 Transformation
Dec. 3	6.5 - Range, Onto Transformation
Dec. 5	6.6 - Matrix of a Linear Transformation
Dec. 7	Problem/Catch-up Day
Dec. 10	Review
Dec. 13	Final Exam (8:30 am - 10:30 am)