Math 2568 Section 75 - Linear Algebra (Spring 2017)

Instructor: Maria Angelica Cueto
Office: Math Tower (MW) 620
Phone: 688-5773
Email: cueto.5@osu.edu

Office Hours: Mon-Wed-Thur 2:00pm-3:00pm in MW 620 (and by appointment if necessary)

Course Description: This course is designed to introduce ideas from linear algebra, with emphasis in both its theoretical and practical aspects. Topics include matrix algebra, vector spaces and linear maps, bases and dimension, eigenvalues and eigenvectors, applications.

Prerequisites: Prereq: A grade of C- or above in 1172, 1544, 2153, 2162.xx, 2182H, or 4182H; or a grade of C- or above in both 1152 and CSE 2321; or credit for 154, 254.xx, 263.xx, 263.01H, or 264H. Not open to students with credit for 4568 (568), 5520H (520H), or 572.

Websites: Important class information will be available on the class website and Carmen:
https://people.math.osu.edu/cueto.5/teaching/2568/Sp17 ; https://carmen.osu.edu

Text: L.W. Johnson, R.D. Riess, J.T. Arnold: *Introduction to Linear Algebra*, 5th edition, Pearson.

Lectures: Mon-Wed-Fri 12:40PM-1:35PM in Scott Lab (SL) N048.

Grading: Your final raw score for this course will be computed using the following weights:

Final Exam (Tuesday May 2, 12:00pm-1:45pm)	40%
Midterm 1 (Friday Feb 3, in class)	20%
Midterm 2 (Friday March 10, in class)	20%
Quizzes 1-11	20%

Your course letter grade will then be determined based on

1. Your **course percentile** (your relative rank among your peers).
2. My determination of the overall class performance level.

For example, if your final raw score is 70/100 and exactly half of the class has a lower raw score, then your course percentile will be 50%. It is impossible to give the final percentile-to-letter-grade correspondence *a priori*. A reasonable percentile-to-letter-grade **estimate** is the following:

Letter grade	A	A-	B+	B	B-	C+	C	C-	D	E
Percentile range	100-90	90-85	85-80	80-70	70-65	65-60	60-40	40-35	35-20	20-0

If your degree program requires a certain letter grade in this course, it is a good idea to think about the likelihood of you ending up in each of the above ranges above early in this semester.

Quizzes: In lieu of graded homework we will have 11 in class quizzes during the semester, roughly one per week (except on midterm weeks). ***Your lowest quiz grade will be dropped.***

Homework: There will be **no graded homework** for this class. Problems from the book will be suggested on the course's website for each section of the book covered during lecture. The purpose is to learn the material discuss in class. **Problems from the homework assignement will be tested on the corresponding quizzes**.

Showing Your Work: Mathematics is not just about deriving the correct numerical solution to a problem. It is also about convincing others that your method of calculation is appropriate. **Insufficiently supported answers may receive partial or no credit on quizzes and exams.**

Calculators etc.: Calculators, cell phones and other electronic devices **will not be permitted**.

Missed Coursework: No late exams or quizzes will be accepted without prior written permission. All requests for rescheduling (e.g. due to sickness, athlete duties or unforseen circumstances) must be made in writing at least 48 hours before the regularly scheduled time. Within 48 hours of an exam or quiz only documented legitimate family or medical emergencies will be considered as excuses.

Course Topics: We will cover Chapters 1-6 of the textbook (see above). This will include:

Ch. 1 Matrices and Systems of Linear Equations

- 1.1 Introduction to Matrices And Systems of Linear Equations
- 1.2 Echelon Form and Gauss-Jordan Elimination
- 1.3 Consistent Systems of Linear Equations
- 1.5 Matrix Operations
- 1.6 Algebraic Properties of Matrix Operations
- 1.7 Linear Independence and Nonsingular Matrices
- 1.9 Matrix Inverses and Their Properties

Ch. 2 Vectors in 2-Space and 3-Space

- 2.1 Vectors in the Plane
- 2.2 Vectors in Space
- 2.3 The Dot Product and the Cross Product
- 2.4 Lines And Planes in Space

Ch. 3 The Vector Space $\mathbb{R}^n$

- 3.1 Introduction to the Vector Space $\mathbb{R}^n$
- 3.2 Vector Space Properties of $\mathbb{R}^n$
- 3.3 Examples of Subspaces
- 3.4 Bases for Subspaces
- 3.5 Dimension
- 3.6 Orthogonal Bases for Subspaces
- 3.7 Linear Transformation from $\mathbb{R}^n$ to $\mathbb{R}^m$

Ch. 4 The Eigenvalue Problem

- 4.1 The Eigenvalue Problem for 2×2 Matrices
- 4.2 Determinants and the Eigenvalue Problem
- 4.4 Eigenvalues and the Characteristic Polynomial
- 4.5 Eigenvectors and Eigenspaces
- 4.6 Complex Eigenvalues and Eigenvectors
- 4.7 Similarity Transformations and Diagonalization

Ch. 5 Vector Spaces and Linear Transformations

- 5.1 Introduction to Vector Spaces and Linear Transformations
- 5.2 Vector Spaces
- 5.3 Subspaces
- 5.4 Linear Independence, Bases and Coordinates
- 5.7 Linear Transformations
- 5.8 Operations With Linear Transformations
- 5.9 Matrix Representations Of Linear Transformations

Ch. 6 Determinants

- 6.1 Introduction to Determinants
- 6.2 Cofactor Expansions Of Determinants
- 6.3 Elementary Operations And Determinants
- 6.4 Cramer's Rule

Academic Misconduct Statement: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-48.7). For additional information, see the Code of Student Conduct at http://studentlife.osu.edu/csc/.

Disability Statement: Students with disabilities that have been certified by Student Life Disabilities Services (SLDS) will be appropriately accommodated and should inform the instructor as soon as possible of their needs. SLDS contact information:slds@osu.edu; 614-292-3307; 098 Baker Hall, 113 W. 12th Avenue.
http://www.ods.osu.edu/