Math 3013 - Linear Algebra

Syllabus - Fall 2019

Instructor: Dr. Birne Binegar
430 Mathematical Sciences
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Lectures: MWF, 10:30–11:20 pm in 004A HSCI

Office Hours: MWF 2:00 – 3:00 in 430 MSCS

Required Text: *Linear Algebra: A Modern Introduction*, 4th Edition, by David Poole, ISBN-13 978-1-285-46324-7

Prerequisites: Calculus II

Course Objectives: Students entering the course are expected to have completed Calculus II and to be very competent at algebra. Upon completing the course students will understand the basic notions of linear systems, vectors, matrix algebra, and vector spaces. Computational skills should be sharp.

Homework: Homework problem sets will be handed out about once a week and your solutions will typically be due the following week. The MLSC (Mathematics Learning Success Center) has tutors on staff who can help you with the homework assignments. The MLSC is located on the 5th floor of the Edmond Low Research Library.

Examinations: There will be two midterm examinations worth 100 pts each and one final examination worth 150 pts.

Grades: Grades will be determined exclusively from homework, midterm, and final exam scores.

2 Midterm Examinations	200 possible pts.
Homework and Quizes	25 possible pts.
Final Examination*	150 possible pts.
	375 possible pts.

Letter grades will be assigned as follows:

A:	337	-	375 pts.
B:	300	-	336 pts.
C:	262	-	299 pts.
D:	225	-	261 pts.
F:	0	-	224 pts.

* The final exam will be Monday, December 9, 2019, 10:00-11:50 am, in 004A HSCI.

Math 3013
Course Outline

I: Vectors and Matrices

- Vectors
- Vector operations
- Matrices
- Systems of Linear Equations
- Solving Linear Systems
- Matrix Inverses
- Subspaces and Bases

FIRST EXAM

II: The Vector Space $\mathbb{R}^n$

- Linear Independence and Dimension
- The Rank of a Matrix
- Linear Transformations

III: General Vector Spaces

- Definition of a Vector Space
- Subspaces, Linear Independence, and Bases
- Coordinatization of Vectors
- Linear Transformations

SECOND EXAM

IV: Determinants

- Areas, Volumes and Cross Products
- Determinants
- Methods of Computing Determinants
- Cramer's Rule

V: Eigenvalues, Eigenvectors, and Eigenspaces

- Eigenvalues, Eigenvectors, and Eigenspaces
- Diagonalization
- Applications

VI: Orthogonality

- Projections
- The Gram-Schmidt Process
- Orthogonal Matrices
- Projection Matrices

FINAL EXAM