SYLLABUS

MATH 2331
LINEAR ALGEBRA
SPRING 2019

Instructor: Alexander Mamonov
Office: PGH 690
Office hours: TuTh 1:00PM - 2:30PM
Phone: (713) 743-0297
E-mail: mamonov@math.uh.edu

Class web page: https://www.math.uh.edu/~mamonov/MATH2331-S2019/index.html
Classroom: SEC 105
Class hours: TuTh 8:30AM - 10:00AM
Class number: 10209

****

The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course including those posted on Blackboard, communicated via e-mail, etc.

****

All class policies, announcements, reviews, homework assignments, solutions and grades are posted on **Blackboard**: http://elearning.uh.edu/webapps/portal/frameset.jsp

Prerequisite: credit for or concurrent enrollment in MATH 1432.

Textbook: David C. Lay, *Linear Algebra and Its Applications*, 4th Edition, Pearson.

Objectives: Upon completion of this course, the students are expected to gain the understanding of the fundamental concepts of linear algebra including systems of linear equations and their solution, linear dependence and independence, linear transformations, matrices and matrix operations, matrix inverses, subspaces, dimension and rank, determinants, vector spaces, subspaces, bases, eigenvectors and eigenvalues, matrix diagonalization, inner products and orthogonality, projections, Gram-Schmidt process, least squares, etc.

Assignments, Exams and Grading: Weekly homeworks, two in-class midterm exams and a final exam will be given. There are no make-ups for the exams. The course grade is determined by the homeworks, midterm exams and the final exam with each having the following weights:

Homework	1/5
Midterm 1	1/5
Midterm 2	1/5
Final Exam	2/5

MATLAB: Matlab software is required for the homework. Matlab can be downloaded from the "Software Download" service at http://uh.edu/software-downloads/list.php

Topics: The following topics are covered (section numbering as in the textbook, the list is subject to change)

Chapter 1: Linear Equations in Linear Algebra
1.1 Systems of Linear Equations
1.2 Row Reduction and Solution Sets of Linear Systems
1.3 Vector Equations
1.4 The Matrix Equation Ax=b
1.5 Solutions Sets of Linear Systems
1.7 Linear Independence
1.8 Introduction to Linear Transformations
1.9 The Matrix of a Linear Transformation

Chapter 2: Matrix Algebra
2.1 Matrix Operations
2.2 The Inverse of a Matrix
2.3 Characterizations of Invertible Matrices
2.4 Partitioned Matrices
2.8 Subspaces of R^n
2.9 Dimension and Rank

Chapter 3: Determinants
3.2 Properties of Determinants
3.3 Cramer's Rule, Volume, and Linear Transformations

Chapter 4: Vector Spaces
4.1 Vector Spaces and Subspaces
4.2 Null Spaces, Column Spaces, and Linear Transformations
4.3 Linearly Independent Sets; Bases
4.5 The Dimension of Vector Space
4.6 Rank

Chapter 5: Eigenvalues and Eigenvectors
5.1 Eigenvectors and Eigenvalues
5.2 The Characteristic Equation
5.3 Diagonalization
5.4 Eigenvectors and Linear Transformations

Chapter 6: Orthogonality and Symmetric Matrices
6.1 Inner Product, Length, and Orthogonality
6.3 Orthogonality and Projections
6.4 The Gram-Schmidt Process
6.5 Least-Squares Problems

Counseling and Psychological Services (CAPS) Statement

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the “Let's Talk” program, a drop-in consultation service at convenient locations and hours around campus.
http://www.uh.edu/caps/outreach/lets_talk.html