MATH 2318 **Fall 2016**

Linear Algebra

Time: TR 9:30 – 10:45
Room: Morelock 205

Instructor: Eric Funasaki
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Office hours:

MWF 10 – 10:50, TR 8:30 – 9:20, TR 11 – 12:15, or by appointment.

Textbook:

Linear Algebra and its Applications, 5th edition, by David C. Lay, Steven R. Lay, and Judi J. McDonald.

Course Description:

Introduces and provides models for application of the concepts of vector algebra. Topics include finite-dimensional vector spaces and their geometric significance; representing and solving systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; matrices; determinants; linear transformations; quadratic forms; eigenvalues and eigenvectors; and applications in science and engineering.

Mathematics Program Learning Objectives:

The student should be able to:
1. Apply knowledge of basic mathematics principles;
2. Identify and provide valid proofs or solutions for theorems or problems; and
3. Recognize and dispute invalid mathematical statements using counterexamples.

Course Objectives:

The student will be able to:
1. Solve linear systems using row reduction;
2. Do matrix operations and understand invertible matrices;
3. Find the determinant of a matrix;
4. Identify vector spaces and subspaces as well as their properties; and
5. Find the eigenvalues and eigenvectors of a matrix.

EC-6 Core Teacher Competencies:

1. Competency 013 (Mathematics Instruction): The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize, and implement instruction and assess learning.
2. Competency 014 (Number Concepts and Operation): The teacher understands concepts related to numbers, operations and algorithms, and the properties of numbers.
3. Competency 015 (Patterns and Algebra): The teacher understands concepts related to patterns, relations, functions, and algebraic reasoning.

4. Competency 016 (Geometry and Measurement): The teacher understands concepts related to principles of geometry and measurement.
5. Competency 017 (Probability and Statistics): The teacher understands concepts related to probability and statistics and their applications.
6. Competency 018 (Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems, and make mathematical connections within and outside of mathematics.

Course Assessment:

Your grade will be based on the following components:

10% In-class problems and participation
20% Homework assignments and quizzes
48% Exams
22% Comprehensive Final Exam

The grading scale will be:

90 – 100 A 80 – 89 B 70 – 79 C 60 – 69 D 0 – 59 F

Course Schedule (tentative):

Week 1
8/23 T 1.1 Systems of Linear Equations, 1.2 Row Reduction and Echelon Forms
8/25 R 1.2 Row Reduction and Echelon Forms

Week 2
8/30 T 1.3 Vector Equations
9/1 R 1.4 The Matrix Equation, 1.5 Solution Sets of Linear Systems

Week 3
9/6 T 1.5 Solution Sets of Linear Systems, 1.7 Linear Independence
9/8 R 1.8 Introduction to Linear Transformations

Week 4
9/13 T 1.9 The Matrix of a Linear Transformation
9/15 R Review for Exam 1

Week 5
9/20 T Exam 1
9/22 R 2.1 Matrix Operations

Week 6
9/27 T 2.2 The Inverse of a Matrix, 2.3 Characterizations of Invertible Matrices
9/29 R 2.5 Matrix Factorizations, 2.8 Subspaces of $\mathbb{R}^n$

Week 7
10/4 T 2.8 Subspaces of $\mathbb{R}^n$, 2.9 Dimension and Rank
10/6 R 2.9 Dimension and Rank, 3.1 Introduction to Determinants

Week 8
10/11 T 3.1 Introduction to Determinants, 3.2 Properties of Determinants
10/13 R Review for Exam 2

Week 9
10/18 T Exam 2
10/20 R 4.1 Vector Spaces and Subspaces

Week 10

10/25	T	4.2 Null Spaces, Column Spaces, and Linear Transformations 4.3 Linearly Independent Sets; Bases
10/27	R	4.3 Linearly Independent Sets; Bases, 4.5 The Dimension of a Vector Space

Week 11

11/1	T	4.5 The Dimension of a Vector Space, 4.6 Rank
11/3	R	5.1 Eigenvectors and Eigenvalues, 5.2 The Characteristic Equation

Week 12

11/8	T	5.2 The Characteristic Equation, 5.3 Diagonalization
11/10	R	5.3 Diagonalization, 5.4 Eigenvectors and Linear Transformations

Week 13

11/15	T	5.5 Complex Eigenvalues
11/17	R	Review for Exam 3

Week 14

11/22	**T**	**Exam 3**
11/24	R	Thanksgiving Break (no class)

Week 15

11/29	T	Review for Final Exam
12/1	R	Dead Day (no class)

Week 16

12/5	**M**	**Final Exam (8 am – 10 am)**
12/6	T	(no class)
12/7	W	(no class)

Attendance:

Role will be taken. You are responsible for all material covered in class as well as any assignments and announcements that are made. If you miss an assignment, exam, or quiz you will receive a grade of zero unless I have been notified in advance.

Sul Ross State University policy is to drop a student with a grade of W or F when 9 hours of class are missed. For this course that is when you miss **6** classes.

Cheating:

Cheating will not be tolerated. Anyone caught cheating will receive a grade of zero on that assignment. This includes homework assignments where the student who copied another student's work and the student who allowed their work to be copied will both receive a grade of zero.

Cell Phones and Other Electronic Devices:

Your cell phone must be **off** while you are in class. You may not read or send text messages while class is in session. If there is an unusual situation where you simply must be able to read and send a message without delay, please place your phone in vibrate mode and leave the room before reading and responding. No other electronic devices may be used during class without the permission of the instructor.

ADA Statement:

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartze, M.Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, TX 79832. Telephone: 432-837-8691. E-mail: mschwartze@sulross.edu.

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