

Linear Algebra Course Syllabus - Spring 2009

Mission Statement: Union's mathematics program seeks to further students in their quest for increased understanding of Creation and the created order and to equip students to serve God, church, and society through excellence in thinking and the use of mathematics. We do this through a curriculum that develops the student's ability to think logically, analytically, and abstractly; to pursue a body of knowledge whose basis is largely independent of both empirical observation and culture; and to learn humility and a sense of wonder at the complexity, beauty, and applicability of mathematics.

I. Basic Information

MAT 315: Linear Algebra, Three (3) credit hours.

Time: 9:25-10:50 TuTh

Prerequisites: MAT 212. (MAT 207 is a desired pre/co-requisite.)

II. Course Instructor

Instructor: Dr. Matt Lunsford

Office Hours: TBA

Office: C – 47

email: mlunsfor@uu.edu

Office Phone: 661- 5222

III. Course Description and Objectives

This course is designed to introduce the student to the area of mathematics known as linear algebra. The main objectives of the course are: 1) to provide a solid foundation in linear algebra by exploring matrices, vector spaces, and linear transformations, and their relationship to abstract algebraic structures, 2) to introduce the student to some important computational aspects of linear algebra, and 3) to discuss some of the interesting applications to which this area of mathematics relates.

IV. Method of Instruction

This course will be taught in a seminar-style setting in which the instructor and the students will share in demonstration, discussion, and problem solving.

V. Required Text

Linear Algebra with Applications (Sixth Edition) - Gareth Williams

VI. Assigned Readings and Research

The student will be required to read selected parts of the above text.

VII. Special Projects and/or Activities

Problem solving assignments from the text and assignments requiring the use of *Mathematica* will be made throughout the course.

VIII. Method of Evaluation

1) Exams: The student will be evaluated by his/her performance on three unit exams and on a final comprehensive exam. Each unit exam will be worth 100 points. The final exam will be worth 125 points and will be given according to the university's final exam schedule.

2) Homework and Mathematica Labs: Throughout the semester, the instructor will give homework assignments from the text and computer lab assignments using *Mathematica*. Some of these assignments will be graded. These assignments may vary in point value.

3) Application Project: Each student (or student group) will complete a project demonstrating an application of Linear Algebra. This project will include a poster with presentation and must use *Mathematica*. The project will be worth 40 points.

The student's final letter grade in the course will be determined by calculating the ratio of the total points earned to the total points possible and using the following grading scale:

A 92 - 100; B 83 - 91; C 74 - 82; D 65 - 73; F 0 - 64

IX. Attendance Policy

Regular attendance is expected of all students. Due to the nature of mathematics, regular attendance is necessary in order for the student to successfully complete the course. Any student who misses an excessive number of times will be reported to the Academic Center. Any student who misses an exam must bring to the instructor a written explanation of the reason for the absence and supporting documents (for example, a note from a physician) within two days of the exam. A make-up exam will not be scheduled unless the above procedure is followed.

X. Cheating and Plagiarism

No forms of cheating will be tolerated. If the instructor observes cheating by a student during an exam, the student will receive a grade of zero for that exam and subsequently will be reported to the Office of the Provost.

XI. Drop Date

The last day to drop the course without special permission of the Registrar is March 10.

XII. Outline of the Course

A. Linear Equations and Vectors

B. Matrices and Linear Transformations

C. Determinants and Eigenvectors

D. Vector Spaces, Subspaces, Linear Independence, Bases

E. Representations and Diagonalization of Matrices F. Inner Product Spaces

XIII. Miscellaneous

In class use of cell phones, PDAs, MP3 players, laptops, and other similar electronic equipment without prior instructor approval is strictly prohibited. Calculators **must** be standalone devices for the purpose of calculation only.