COURSE SYLLABUS

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YEAR COURSE OFFERED: 2013

SEMESTER COURSE OFFERED: Summer

DEPARTMENT: Mathematics

COURSE NUMBER: 4377

NAME OF COURSE: Advanced Linear Algebra

NAME OF INSTRUCTOR: Dr. Philip Walker

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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.

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Learning Objectives

Upon completion of this course, it is expected that students will have an understanding of vector spaces, linear transformations, and matrices.

Major Assignments/Exams and Percent of Course Grade

Exam I 16 2/3 %
Exam II 16 2/3/%
Exam III 16 2/3/%
Quizzes and Graded Homework 16 2/3 %
Final Exam 33 1/3 %

Required Reading

The text for the course is:

COURSE SYLLABUS

Topics

1.1 Introduction (and excerpts from Appendices A (Sets), B (Functions), C (Fields), D (Complex Numbers))
1.2 Vector Spaces
1.3 Subspaces
1.4 Linear Combinations and Systems of Linear Equations
1.5 Linear Dependence and Linear Independence
1.6 Bases and Dimension
1.7* Maximal Linearly Independent Subsets
2.1 Linear Transformations, Null Spaces, and Ranges
2.2 The Matrix Representation of a Linear Transformation
2.3 Composition of Linear Transformations and Matrix Multiplication
2.4 Invertibility and Isomorphisms
2.5 The Change of Coordinate Matrix
2.6 Dual Spaces
2.7* Homogeneous Linear Differential Equations with Constant Coefficients
3.1 Elementary Matrix Operations and Elementary Matrices
3.2 The Rank of a Matrix and Matrix Inverses
3.3 Systems of Linear Equations-Theoretical Aspects
3.4 Systems of Linear Equations-Computational Aspects
4.1 Determinants of Order 2
4.2 Determinants of Order n
4.3 Properties of Determinants
4.4 Summary -- Important Facts about Determinants
4.5* A Characterization of the Determinant
5.1 Eigenvalues and Eigenvectors (and Appendix E (Polynomials))
5.2 Diagonalizability