Syllabus: MA 316 Linear Algebra II

Bulletin description:

A continuation of MA 237. Topics include inner product spaces, spectral theorem for symmetric operators, complex vector spaces, Jordan canonical form. Additional topics such as duality and tensor products to be included at the discretion of the instructor. Prerequisite: MA 237. Core course.

Text:

Spring 2011: Penney, Richard C. Linear Algebra Ideas and Applications, 3rd edition, Wiley ISBN 978-0-470-17884-3

Fall 2011 and beyond: Lipshultz, Seymour and Lipson, Marc Linear Algebra, 4th edition, in the Schaum's outline series McGraw-Hill (2009) ISBN 978-0-07-154352-1.

Coverage:

Spring 2011: Chapter 6 and 7: roughly one section per week, but at the discretion of the instructor.

Fall 2011 and beyond: Chapters 7, Chapters 10-13 of Schaum's. One should plan to cover roughly one section per 50 minute period, but the instructor has discretion in coverage.

Learning Objectives:

Upon the successful completion of the course a student will be able to:

1. determine an orthonormal basis from a give basis of a finite dimensional vector space;
2. approximate a sine or cosine function by Fourier polynomials;
3. determine a least squares approximation to a given data set;
4. use the spectral theorem to classify quadratic forms;
5. understand and apply the hermitian spectral theorem;
6. decompose an arbitrary rectangular matrix in SVT form;
7. compute the Jordan canonical form.