MATH0047(Advanced Linear Algebra)

Year:	2019–2020
Code:	MATH0047
Old Code:	MATH6403
Level:	5 (UG)
Normal student group(s):	UG: Students outside Mathematics
Value:	15 credits (= 7.5 ECTS credits)
Term:	1
Structure:	4 hours of lectures / problem classess per week
Assessment:	90% examination, 10% coursework
Normal Pre-requisites:	MATH0045 / MATH0046 or ECON0006 / ECON0010
Lecturer:	Dr I Strouthos

Course Description and Objectives

In this course, we will aim to develop aspects of the theory of matrices and give an introduction to the theory of vector spaces and the theory of linear maps. During the course, we are also due to see examples of techniques which illustrate the use of the relevant mathematical objects.

Recommended Texts

There is a number of textbooks covering the subject area(s) studied in this course. We will aim to make the course quite self-contained, but please feel free to contact the lecturer if you would like to obtain some further information regarding suitable textbooks for the course.

Detailed Syllabus

Matrices and linear equations: A description of some ideas and conventions present in the theory of matrices, as well as a description of systems of linear equations, including the use of matrices to solve such systems of equations.

Determinants: An introduction to the notion of the determinant of a matrix and its usefulness in problems involving systems of linear equations, including a description of various ways of computing determinants of matrices.

Vector spaces: An introduction to the setting of vector spaces, including the notions of inner products, norms and projections of vectors, as well as a study of notions related to vector subspaces and bases, including relevant examples.

Linear maps: A description of linear maps, including the notions of the kernels and images of linear maps, as well as a study of notions related to eigenvectors and eigenvalues, and matrix diagonalisation.