COURSE SPECIFICATION DOCUMENT

Academic School / Department: Richmond Business School

Programme: BA (Hons) Economics with Combined Studies

***FHEQ* Level:** 6

Course Title: Mathematical Methods for Economics

Course Code: MTH 6130

Course Leader: David M Munyinyi

Student Engagement Hours: 120 (standard 3- credit BA course)
Lectures: 35
Seminar / Tutorials: 10
Independent / Guided Learning: 75

Semester: Spring

Credits: 12 UK CATS credits
6 ECTS credits
3 US credits

Course Description:
This course considers the application of mathematical methods to represent economic theories and analyze problems posed in economics. The course will cover essential calculus, difference and differential equations, matrix algebra, linear and non-linear optimization, concavity and convex functions, linear and non-linear programming, optimal control, equilibrium analysis and game theory in economics. The emphasizes will be on techniques and applications in economics.

Prerequisites:
ECN 4105, ECN 4110 and MTH 4110

Aims and Objectives:
The course aims to provide students with an understanding of mathematical aspects of economics and economic theories, where students will be encouraged to engage in the formation of theoretical economic relationships through generalizations, simplication and analysis of practical models. An understanding of mathematical economics is particularly important for students considering employment in various economic sectors or the pursuit of a graduate degree in economics.

Programme Outcomes:

A2
A5
B3
D

A detailed list of the programme outcomes are found in the Programme Specification.

This is located at the archive maintained by the Registry and found at: https://www.richmond.ac.uk/programme-and-course-specifications/

Learning Outcomes:
By the end of this course, successful students should be able to:

- Have a sound and broad understanding of differential calculus to include partial derivatives, methods of integration and calculus of variation to two variables.
- Have a broad understanding how to solve difference and differential equations upto second order.
- Have a broad understanding of the concepts matrix algebra and its applications to problems in economics.
- Be able to analyse economic problems involving linear and nonlinear optimization, linear and nonlinear programming and optimal control.
- Have a broad understanding of the concepts functional analysis that involves concavity and convex functions as applied in economics
- Be able to use game theoretic concepts to understand oligopoly firm behaviour, and to predict likely outcomes when firms engage in certain behaviors, such as price-fixing and collusion.

Indicative Content:

- Partial derivatives, integration by substitution and by parts
- Calculus of two variables – determination of saddle points
- Solutions of difference and differential equations to second order
- Matrix algebra - inverse matrices, determinants, eigenvalues/eigenvectors
- Linear and nonlinear optimization / programming
- Optimal control
- Functional analysis – concavity and convex function
- Game theoretic approach to economics

Assessment:
This course conforms to the Richmond University Math Assessment Norms approved at Academic Board and located at: https://www.richmond.ac.uk/policies/

Teaching Methodology:
Course material is presented and analyzed in the following ways:
a) Formal presentation of topics and worked exercises.
b) Self-learning assignments and directed mathematical exercises.
c) Participation in individual and group investigations.
d) Where appropriate, students will be introduced to solution aids, such as hand-held calculators, mathematical tables and computer software.
e) Making use of a Virtual learning Site (VLE)

Indicative Text(s):
Klein, M. (2014) Mathematical Methods for Economics, 2nd edition, Pearson Publishers.
Journals

Web Sites

See syllabus for complete reading list

Change Log for this CSD:

Nature of Change	Date Approved & Approval Body (School or AB)	Change Actioned by Registry Services
Pre-requisite Change	Nov 19	