L-Università ta' Malta

Study-Unit Description

CODE	ECN2215
TITLE	Mathematical Economics
LEVEL	02 - Years 2, 3 in Modular Undergraduate Course
ECTS CREDITS	4
DEPARTMENT	Economics

DESCRIPTION

The pedagogy of the study-unit is constructed as to to incorporate the understanding of mathematical techniques together with fundamental economic concepts at each stage of the course, thus underscoring the importance of economic applications and contributing to a holistic understanding of the subject.

Both basic mathematical methods as well new techniques of mathematical analysis have become indispensable for a proper understanding of the current economic literature. This study-unit is designed to present a thorough, easily understood introduction to the wide array of mathematical topics students are required to know to successfully obtain an undergraduate degree in economics.

The indicative list of topics to be covered are as follows:
- Equilibrium Analysis;
- Comparative Statics and the Derivative Concept;
- Derivatives and Economic Analysis;
- Exponential and Logarithmic Functions;

- Optimization in Economic Analysis;
- Optimization with Multi-Variable Functions;
- Advanced Topics in Optimization - Unconstrained and Constrained Optimization;
- Integration and Economic analysis;
- Fundamentals of Matrix Algebra;
- Economic analysis with Matrix Algebra.

Study-unit Aims:

This study-unit aims to provide the students with a clear focus on the practical usefulness of mathematics to economic analysis. The aim of the study-unit is to introduce and develop a range of mathematical skills and techniques that can be applied to attain significant insights into the analysis of economic behavior.

Learning Outcomes:

1. <u>Knowledge & Understanding</u>:

By the end of the study-unit the student will:
- Have a firm grasp of a wide array of mathematical topics economists need to muster today, such as linear algebra, differential and integral calculus, nonlinear programming,differential and difference equations, the calculus of variations and optimal control theory.
- Be able to apply the knowledge they have gained to gain a better understanding of other economics and finance topics in their programme of studies.
- Appreciate that mathematics is a fundamental language of economics and finance, and that through mastering this language, students will be more capable of both communicating effectively economic concepts; also, expertise in understanding mathematical expressions will increase the exposure of students to the more recent and rather complex research literature which would otherwise be rendered incomprehensible to those not adequately trained in mathematical and analytical techniques.

2. <u>Skills</u>:

By the end of the study-unit the student will be able to:
- Express economic issues and applications in terms of the relevant mathematical notation and equations, both within this subject as well as in other topics of economics and finance which easily lend

themselves to mathematical expression.
- Manipulate effectively mathematical expressions in accordance with the dynamic requirements of the economic/financial system under investigation.
- Interpret in a coherent and consistent manner mathematical expressions whenever they crop up in economic literature.
- Apply their grasp of numeracy and intuitive knowledge of analytical techniques to their work during the rest of their academic studies, whether this consists of assignments, dissertations, etc.

Main Text/s and any supplementary readings:

- M.Wisniewski ,(2013), "Mathematics for Economics", Third Edition, Palgrave Macmillan.
- M.Rosser, (2003), "Basic Mathematics for Economists", Second Edition, Routledge, Taylor and Francis Group.
- A.Asano, (2013), "An introduction to Mathematics for Economics", Cambridge University Press.

ADDITIONAL NOTES Pre-requisite Study-units: EMA1008 and EMA1009

STUDY-UNIT TYPE   Lecture and Tutorial

METHOD OF ASSESSMENT	Assessment Component/s	Assessment Due	Resit Availability	Weighting
	Assignment	SEM2	Yes	20%
	Examination	SEM2	Yes	80%

LECTURER/S   Ian P. Cassar (Co-ord.)

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The availability of optional units may be subject to timetabling constraints.
Units not attracting a sufficient number of registrations may be withdrawn without notice.
It should be noted that all the information in the study-unit description above applies to the academic year 2019/0, if study-unit is available during this academic year, and may be subject to change in subsequent years.

https://www.um.edu.mt/course/studyunit