## **MODULE DESCRIPTOR**

TITLE	Maths for Economics					
SI MODULE CODE	44-4939-00L					
CREDITS	20					
LEVEL	4					
JACS CODE	G100					
SUBJECT GROUP	International Business					
DEPARTMENT	Management					
MODULE LEADER	Konstantinos Lagos					
NOTIONAL STUDY	Tutor-led Tutor-directed Self-directed Total Hours					
HOURS BY TYPE	36 N/A 164 200					

#### MODULE AIM(S)

This module aims to examine the key mathematical concepts widely applied in modern business and economics. These include algebraic manipulation, functions, and elementary differential calculus, with particular application to optimisation in economics. It is designed to enable all students, regardless of their mathematical background, to apply mathematical concepts to business and economic problems.

## **MODULE LEARNING OUTCOMES**

- 1. Provide an understanding of the essential mathematical skills
- 2. Enable students to apply the correct mathematical approach in formulating and analysing problems in the context of business and economics
- 3. Provide the appropriate tools that will enable the development of students' practical and applied mathematical skills in the context of business and economics
- 4. Enhance the experience of presenting one's own work in class

## **INDICATIVE CONTENT**

Introduction to arithmetic and algebra:

- Linear equations
- Simultaneous equations
- Indices
- Exponents and logarithms
- Non-linear equations

Introduction to calculus:

- Rules of calculus
- Further rules of calculus

Financial economics:

- Profit, revenue and cost functions
- Discrete/continuous growth
- Income tax, sales taxes and subsidies
- Arc vs point elasticities

Derivatives and Differentials:

- Derivatives of multivariate functions
- Partial elasticities
- Differentials and total differentials

• Higher order derivatives

#### Optimisation:

- Optimisation of univariate functions
- Optimisation of multivariate functions
- Constrained optimisation:
  - The Substitution method
  - > The Lagrange Multiplier method

## LEARNING AND TEACHING METHODS

Students will be supported in their learning, to achieve the above outcomes, in the following ways:

- <u>Lectures</u> will be used to introduce the topics and methods of approaching particular areas/subjects.
- Seminars will be used enhance student learning. Attendance, preparation and participation in these sessions are essential for the student to achieve the learning outcomes specified above. It is essential that students prepare in advance answers to any set exercises/questions, so that errors/misunderstandings and can be spotted and corrected. Seminars can also be used as a session where students will have the chance to have verbal feedback and a chance for a regular formative self-assessment.
- Students will be required to engage in self-directed/self-motivated learning activities, such as supplementary reading of extra material, in order to enhance their understanding of the topics discussed in classes.
- Assessment will be used to test the ability of students to fulfil the expected learning outcomes.

# ASSESSMENT STRATEGY AND METHODS

Task No.	TASK DESCRIPTION	SI Code	Task Weighting %	Word Count / Duration	In-module retrieval available
1	Coursework (class test)	CW	40	1 hour	No
2	Exam	EX	60	2 hours	No

Task Descriptions and SI Codes

## **ASSESSMENT CRITERIA**

To successfully complete the module, students will have to show that they are able to fulfil the learning outcomes outlined earlier. This ability will be assessed through one piece of coursework (in the form of a written phase test) accounting for 40% of the final mark and a 2 hour exam at the end of the year, accounting for the remaining 60% of the module's final mark.

# Assessment Criteria for Maths for Economics

Assignment	First (70%+)	Upper	Lower	Third	Fail
marking	, , , , , , , , , , , , , , , , , , ,	Second	Second	(40% - 49%)	(below 40%)
criteria		(60%-69%)	(50% - 59%)		
Accuracy of Calculations	The vast majority of the tasks have been answered using the correct calculations.	Most of the tasks posed have been answered using the correct calculations.	A reasonable number of tasks have been answered using the correct calculations.	A limited number of tasks have been answered using the correct calculations.	The majority of tasks have been answered incorrectly.
Ability to analyse and evaluate mathematical problems	Excellent standard of analysis and evaluation of the mathematical problems posed. Higher level of mathematical knowledge is demonstrated by presenting a broad and deep knowledge of theory and concepts, which are used appropriately.	Good standard of analysis and evaluation of mathematica I problems posed. The theory and the concepts used are relevant to the task set.	Reasonable standard of analysis and evaluation of most of the mathematical problems posed. The answer indicates that the appropriate theories and concepts are used but not always in the right context.	Limited standard of analysis and evaluation of the mathematical problems posed. The answer includes theories and concepts not necessarily relevant to the defined task.	Very limited standard of analysis and evaluation of the mathematical problems posed. Most of the concepts and theories included in the answers are irrelevant or incorrect.
Ability to understand and apply the appropriate mathematical techniques in answering the questions	Excellent use and application of the appropriate techniques in solving the problems posed. The correct method for solving the problem/questi on posed has been applied successfully in the vast majority of the cases.	Good use and application of the appropriate techniques in solving the problems posed. The correct method for solving the problem/que stion posed has been applied successfully in most of the cases.	Reasonable use and application of the appropriate techniques in solving the problems posed. The correct method for solving the problem/ques tion posed has been applied successfully in some cases.	Limited use and application of the appropriate techniques in solving the problems posed. The correct method for solving the problem/ques tion posed has been applied successfully in a limited number of questions.	Very limited use and application of the appropriate techniques in solving the problems posed. In most of the cases the correct method for solving the problem/ques tion posed has not been applied successfully.

FEEDBACK

Students will receive feedback on their performance in the following ways:

- Students will be receiving formative feedback during seminar sessions
- Students will be receiving summative feedback within 3 weeks of the phase test

## LEARNING RESOURCES (INCLUDING READING LISTS)

Renshaw G (2009), Mathematics for Economics, 2nd Edition, Oxford University Press

Jacques I (2006), Mathematics for Economics and Business, 6th edition, Prentice Hall

(Please remember that this module is regularly revised and some of the indicative contents, learning resources, etc may be subject to change)

### SECTION 2 'MODEL A' MODULE (INFORMATION FOR STAFF ONLY)

#### MODULE DELIVERY AND ASSESSMENT MANAGEMENT INFORMATION

#### MODULE STATUS - INDICATE IF ANY CHANGES BEING MADE

NEW MODULE	Yes
EXISTING MODULE - NO CHANGE	No
Title Change	No
Level Change	No
Credit Change	No
Assessment Pattern Change	No
Change to Delivery Pattern	No
Date the changes (or new module) will be implemented	09/2012

**MODULE DELIVERY PATTERN -** Give details of the module delivery pattern. If the course has more than one intake, for example, September and January, please give details of the module start and end dates for each intake.

	Module Begins	Module Ends
Course Intake 1	09/2012	05/2013
Course Intake 2	n/a	n/a
Course Intake 3	n/a	n/a

Is timetabled contact time required for this module? unknown

Are any staff teaching on this module non-SHU employees?	No
If yes, please give details of the employer institution(s) below	
n/a	
What proportion of the module is taught by these non-SHU	n/a
staff, expressed as a percentage?	

#### MODULE ASSESSMENT INFORMATION

Does the Module (using Model A Assessment Pattern) Require Either*				
Overall Percentage Mark of 40%	Yes			
Overall Pass / Fail Grade	No			

\*NB: Choose one of the above – Model A module <u>cannot</u> include both percentage mark and pass/fail graded tasks

#### FINAL TASK

According to the Assessment Strategy shown in the Module	Task No.
Descriptor, which task will be the LAST TASK to be taken or	
handed-in? (Give task number as shown in the Assessment	1 (final
Strategy)	exam)

#### MODULE REFERRAL STRATEGY

Task for Task (as shown for initial assessment strategy)	Yes
Single Referral Package for All Referred Students	No

\*if YES complete table below

## SINGLE REFERRAL PACKAGE DETAILS

Task No.	TASK DESCRIPTION	SI Code	Task Weighting %	Word Count / Duration
1				
2				
3				
4				
5				
6				

Task Descriptions and SI Codes