UNIVERSITY OF PIRAEUS

FACULTY/SCHOOL	**School of Economics, Business and International Studies**		
DEPARTMENT	**Department of Economics**		
LEVEL OF STUDY	**Undergraduate**		
COURSE UNIT CODE	**ΟΚΜΑΘ07**	**SEMESTER**	**2**
COURSE TITLE	**MATHEMATICS II**		
WEEKLY TEACHNG HOURS	**6**	**CREDITS (ECTS)**	**6**
COURSE TYPE	Mandatory		
PREREQUISITE COURSES			
INSTRUCTION LANGUAGE	English	**ASSESSMENT LANGUAGE**	English
OPEN TO ERASMUS	Yes		

LEARNING OUTCOMES

This course being the sequel of "Mathematics I" shares the same goals and ambitions with "Mathematics I", i.e. it aims at providing the necessary technical background for an in-depth understanding of key concepts of both economics and business. The course touches upon topics of mathematics such as implicit differentiation, partial derivatives of two-variable functions, higher order partial derivatives, optima, first order condition, basic differentiability theorems, monotonicity, second order condition, a preliminary of the envelope theorem, elasticities, convex and concave functions, convex sets,
quasi-convexity, Taylor polynomials and approximation, antiderivatives, integration techniques, the definite integral, multivariable functions, constrained optimization, least square analysis. Special emphasis is given to the way these concepts and techniques are being applied for the solution of standard problems in business and economics.
The tools students will learn in this course will allow them to analyse theoretical models and derive policy conclusions for Economics and Business issues.

GENERAL COMPETENCES

Understanding the quantitative background of theoretical models in economics and business.
Acquiring a solid knowledge of the standard mathematical tools applied in economics.
Quantitative evaluation and decision taking.

COURSE CONTENT

Course Contents

- Implicit differentiation – Partial derivatives
- Extreema – First order condition
- Basic differentiability theorems - Monotonicity
- Second order condition – Envelop theorem
- Elasticity
- Convex and concave functions
- Convex sets – Quasi-convex(concave) functions
- Taylor polynomials
- Antiderivative
- Integration techniques
- The definite integral and applications
- Multivariable real functions
- Constrained optimisation

USE OF ICT IN TEACHING

Use of ICT in lectures

COURSE DESIGN

Activity/Method	Semester workload
Lectures	78
Tutorials	10
Study	42
Exercises	18
Exam	2
Total	150

COURSE ASSESSMENT

The evaluation of the course is implemented through a final examination.
The language of evaluation is Greek.

SUGGESTED BIBLIOGRAPHY

-Suggested bibliography:

- Μ. Λουκάκης, Πρόσκληση στα Μαθηματικά τ. Α, Εκδόσεις Σοφία.
- Ε. Φούντας, Α. Σαπουνάκης, Ανάλυση και Εφαρμογές 2, Εκδόσεις Βαρβαρήγου.

- Related Journal: Journal of econometrics

- Σ. Κώτσιος, Ασκήσεις Μαθηματικών για Οικονομολόγους, Α, Εκδόσεις Κριτική.
- Α. Ξεπαπαδέας, Ι. Γιαννίκος, Μαθηματικές μέθοδοι στα οικονομικά, Α, Εκδόσεις Gutenberg.
- Γ. Σαραφόπουλος, Ν. Μυλωνάς, Μαθηματικά Οικονομικών Επιστημών, Εκδόσεις Τζιόλα.

	• http://ocw.mit.edu/courses/mathematics/18-013a-calculus-with-applications-spring-2005/ • A. Chiang, K. Wainwright, Fundamental Methods of Mathematical Economics, McGraw-Hill. • R.L. Finney, M.D. Weir, F.R. Giordano, Calculus for Engineers and Scientists II, Addison-Wesley. • K. Sydsaeter, A. Storm, P. Berck, Economists' Mathematical Manual, Springer-Verlag. • M. Spivak, Calculus, Publish or Perish.