

MATHEMATICS II

- **Course code**
8102
- **Type of course (compulsory, optional)**
Compulsory
- **Level of course**
First cycle
- **Year of study**
2013-2014
- **Semester**
2nd Semester
- **Number of credits allocated**
6 ECTS Credits
- **Name of lecturer**
Kritikos Emmanouil, Lecturer
- **Learning outcomes**

The goal of the course is to teach students advanced topics in mathematics for Business & Economics. The course is designed to provide both intuition and deep understanding of concepts in Linear Algebra, Calculus of multiple variable functions Implicit functions, Differential Equations, Difference Equations and Constrained Optimization Methods for multiple variable functions. The first semester mathematics on Differential and Integral Calculus is a prerequisite. The course helps students familiarize real life applications that illustrate the use of mathematical concepts in business economics and technology as well as in decision sciences. During the course, students are encouraged to computer usage via modern computational platforms such as MATHEMATICA, MATLAB, and EXCEL. Specific tutorials for the Mathematica are offered during the course.


- **Mode of delivery (face-to-face, distance learning)**
Face to Face
- **Prerequisites and co-requisites**
N.A
- **Recommended optional programme components**
Laboratory training on EXCEL, MATHEMATICA and MATLAB
- **Course contents**


Vectors, Matrices and Linear Systems, Dimension, Rank and Linear Transformations, The Vector Space \mathbb{R}^n , Determinants, Eigenvalues and Eigenvectors, Orthogonality, Change Basis, Solving Large Linear Systems, .Implicit Functions, the Implicit Function Theorem,


Introduction to Differential Equations, Modeling with Differential Equations, First Order Differential Equations, Higher Order Differential Equations, Solutions of Second Order Linear Homogeneous Differential Equations with Constant Coefficients, Solutions of Second Order Linear Nonhomogeneous Differential Equations with Constant Coefficients, Applications of Higher Order Differential Equations. Difference Equations, Calculus of Functions with Multiple Variables, Partial Derivatives, Differentiability, Extreme Values of Functions, Optimization Functions Constrained Optimization, the Method of Lagrange Multipliers


- **Recommended or required reading**


 M. Abell and J. Braselton, "Mathematica by Example", Academic Press

 A. Chiang, "Fundamental Methods of Mathematical Economics", McGraw-Hill
International Editions

 P. Miliotis Constrained Optimization Theory ,AUEB

 K. Sydsaeter and P. Hammond, "Mathematics for Economic Analysis", Prentice-Hall,
Inc.

 T. Yamane & A. Kintis, Mathematics for Business and Economics, Gutenberg

 The notes of the course are made available to students in web

- **Planned learning activities and teaching methods**

Teaching will include lectures, tutorial lessons and lab sessions on EXCEL, MATHEMATICA and MATLAB

- **Assessment methods assessment methods and criteria**

The course grade will be based on a final written exam and on optional individual essays

- **Language of instruction**

Greek

- **Work placement(s)**

N.A