

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	Economics and Public Administration		
<b>DEPARTMENT</b>	ECONOMIC AND REGIONAL DEVELOPMENT		
<b>LEVEL OF STUDY</b>	Undergraduate		
<b>COURSE CODE</b>	80104	<b>SEMESTER OF STUDY</b>	B'
<b>COURSE TITLE</b>	<b>MATHEMATICS II</b>		
<b>SELF-ENDED TEACHING ACTIVITIES</b> In case the credits are awarded in separate parts of the course, e.g. Lectures, Laboratory Exercises, etc. If the credits are awarded uniformly for the entire period, enter the weekly teaching hours and total credits.	<b>WEEKLY TEACHING HOURS</b>	<b>CREDIT UNITS</b>	
	4	6	
Add rows if necessary. The teaching organization and methods are described in detail in (d).			
<b>COURSE TYPE</b> <i>general knowledge, special knowledge, skill development</i>	General knowledge, skill development		
<b>PREREQUISITE COURSES:</b>	None		
<b>TEACHING and EXAMINATION LANGUAGE:</b>	Greek		
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	No		
<b>COURSE WEBSITE (URL)</b>	<a href="https://openeclass.panteion.gr/courses/TMI184/">https://openeclass.panteion.gr/courses/TMI184/</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p>The course's learning outcomes are described as the specific knowledge, skills and abilities of an appropriate level that the students will acquire after successfully completing the course.</p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> <li>• Description of the Level of Learning Outcomes for each course of study according to the Qualifications Framework of the European Higher Education Area</li> <li>• Descriptive Indicators for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Annex B</li> <li>• Comprehensive Guide to Writing Learning Outcomes</li> </ul>		
<p>Upon successful completion of the course, students are expected to understand the generalized integrals and the utility of Taylor expansions. They will also be able to understand the basic concepts of difference equations, differential equations and have gained familiarity with their basic applications.</p>		
<p><b>General Competences</b></p> <p><i>They are considering the general skills that the graduate must have acquired (as stated in the Diploma Appendix and listed below); which / which of them is the course aimed at?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <i>Search, analysis and synthesis of data and information using the necessary technologies.</i>  <i>Adaptation to new situations</i>  <i>Decision making</i>  <i>Autonomous work</i>  <i>Teamwork</i>  <i>Work in an international environment.</i>  <i>Work in an interdisciplinary environment.</i>  <i>Generating new research ideas</i> </td> <td style="width: 50%; vertical-align: top;"> <i>Project planning and management</i>  <i>Respect for diversity and multiculturalism</i>  <i>Respect for the natural environment</i>  <i>Demonstrating social, professional and ethical responsibility and sensitivity to gender issues</i>  <i>Exercise criticism and self-criticism.</i>  <i>Promotion of free, creative and inductive thinking</i>  <i>Others</i> </td> </tr> </table>	<i>Search, analysis and synthesis of data and information using the necessary technologies.</i> <i>Adaptation to new situations</i> <i>Decision making</i> <i>Autonomous work</i> <i>Teamwork</i> <i>Work in an international environment.</i> <i>Work in an interdisciplinary environment.</i> <i>Generating new research ideas</i>	<i>Project planning and management</i> <i>Respect for diversity and multiculturalism</i> <i>Respect for the natural environment</i> <i>Demonstrating social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Exercise criticism and self-criticism.</i> <i>Promotion of free, creative and inductive thinking</i> <i>Others</i>
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<p>The course aims to learn the basic mathematical tools used in Economics.</p>		

### (3) COURSE CONTENT

<p>The course mainly provides an introduction to difference and differential equations.</p> <p>The following thematic areas are presented in the lectures:</p> <ul style="list-style-type: none"> <li>• Calculation of integrals of type A and B.</li> <li>• Taylor and Maclaurin expansions.</li> <li>• Discrete time. Differences and basic concepts of difference equations.</li> </ul>
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- Linear difference equations.
- Dynamic stability.
- Applications.
- Basic concepts of differential equations. Existence of solution. Initial value problems.
- Linear DEs with constant coefficients.
- Dynamic stability
- Special forms of ODES
  - Exact equations
  - Separation of variables
  - Integration Factors
  - Homogeneous Differential Equations
  - Full Differential Eq.
  - Bernoulli and Ricatti equations
- Applications.

#### (4) TEACHING AND LEARNING METHODS – EVALUATION

<b>TEACHING METHOD</b> <i>Face-to-face, Distance learning etc.</i>	Face to face	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of I.C.T. in Teaching, Laboratory Education, in Communication with students Χρήση Τ.Π.Ε. στη Διδασκαλία, στην Εργαστηριακή Εκπαίδευση, στην Επικοινωνία με τους φοιτητές</i>	<i>Use of I.C.T. in Teaching, in weekly progress and the final written exam, in teaching support, as well as in Communication with students</i> <a href="https://openeclass.panteion.gr/courses/TMI184/">https://openeclass.panteion.gr/courses/TMI184/</a>	
<b>TEACHING ORGANIZATION</b> <i>The way and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercises, Field Exercises, Literature Study &amp; Analysis, Tutorials, Internships (Placement), Clinical Exercises, Art Workshops, Interactive Teaching, Educational Visits, Study Preparation (Projects), Writing Papers / Assignments, Artistic Creation, etc. The student's study hours are listed for each learning activity, and the hours of unguided study according to ECTS principles Activity Semester Workload.</i>	<b>ACTIVITY</b>	<b>SEMESTER WORKLOAD</b>
	Lectures	52
	Unguided Study	128
	<b>Total Course (30 hours per ECTS)</b>	<b>180</b>
<b>STUDENT EVALUATION</b> <i>Description of the evaluation process Assessment Language, Assessment Methods, Formative or Deductive, Multiple Choice Tests, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignments, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Patient Examination, Artistic Interpretation, Other / Others Explicitly defined evaluation criteria are mentioned, and if and where they are accessible to students.</i>	<i>Description of the evaluation process</i> - Written exam at the end of the semester: 100% <u><i>Student Assessment Methods</i></u> - Written Examination <u><i>Communication of the explicitly defined evaluation criteria for students</i></u> - In the study guide - On the course website: <a href="https://openeclass.panteion.gr/courses/TMI184/">https://openeclass.panteion.gr/courses/TMI184/</a>	

#### (5) RECOMMENDED BOOKS AND JOURNALS

##### - Suggested Literature:

- Berkin J. (2015). *Μαθηματικά για οικονομολόγους με εφαρμογές*, Εκδόσεις Δαρδανός.
- Chiang A., Wainwright K. (2009). *Μαθηματικές μέθοδοι οικονομικής ανάλυσης*, 2<sup>η</sup> έκδοση, Κριτική.
- Hoy M., Livernois J., McKenna C., Stengos T., Rees R. (2013). *Μαθηματικά*

*Οικονομικών Επιστημών, Εκδόσεις Gutenberg.*

- Ξεπαδάεας Α.Π. και Γιαννίκος Ι.Χ. (2007). *Μαθηματικές Μέθοδοι στα Οικονομικά. Θεωρία και Εφαρμογές*, Εκδόσεις Δαρδανός.
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