

## MODULE SPECIFICATION "MATHEMATICS"

### (1) GENERAL

<b>SCHOLL</b>	SCHOOL OF ECONOMIC AND REGIONAL STUDIES		
<b>DEPARTMENT</b>	ECONOMICS		
<b>LEVEL OF STUDY</b>	POSTGRADUATE		
<b>MODULE CODE</b>	MOE103	<b>SEMESTER OF STUDY</b>	A'
<b>MODULE TITLE</b>	MATHEMATICS		
<b>INDEPENDENT TEACHING ACTIVITIES</b>		<b>TEACHING HOURS PER WEEKS</b>	<b>CREDITS (ECTS)</b>
LECTURES		3	7,5
<b>MODULE TYPE</b>	GENERAL BACKGROUND		
<b>PREREQUISITE MODULES:</b>	NO		
<b>INSTRUCTION AND EXAMINATIONS LANGUAGE::</b>	GREEK		
<b>THE MODULE IS OFFERED TO ERASMUS STUDENTS</b>	NO		
<b>MODULE WEBPAGE (URL)</b>	<a href="https://openeclass.uom.gr/courses/MEC110/">https://openeclass.uom.gr/courses/MEC110/</a>		

### (2) LEARNING OUTCOMES

<b>Learning Outcomes</b>
Upon successful completion of the course, the student will be able to: <ul style="list-style-type: none"> <li>• understand advanced mathematical concepts in order to use them to solve economic problems,</li> <li>• understand the mathematical tools used in the economic literature,</li> <li>• move on to even more advanced math concepts with autonomous work.</li> </ul>
<b>General Competencies</b>
Autonomous work and thinking Promoting free, creative, and inductive thinking

### (3) MODULE OUTLINE

<p>The module begins with a brief description of important topics in Matrix Algebra (e.g. eigenvalues, eigenvectors, definiteness and decomposition of a matrix etc). We then turn to calculus and review tools of static analysis beginning with unconstrained optimisation of single and multivariate functions. Afterwards, we examine optimisation under (i) equality constraints and (ii) inequality constraints (Kuhn-Tucker theorem). Finally, we analyze key-issues of difference equations, differential equations and dynamic optimization. Throughout the semester numerous examples will be analyzed to help the students understand the various mathematical concepts covered during the lectures.</p>
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### (4) TEACHING AND LEARNING METHODS – ASSESSMENT

<b>DELIVERY METHOD</b>	Face to face	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b>	<ul style="list-style-type: none"> <li>• Use of the open eClass online platform</li> </ul>	
<b>TEACHING METHODS</b>	<i>Activity</i>	<i>Semester workload</i>
	LECTURES	39
	AUTONOMOUS STUDY	186

	<b>TOTAL COURSE</b>	225
<b>STUDENT ASSESEMENT METHODS</b>	The evaluation of students is done through written examinations in Greek. The written examinations take place (a) in the middle of the semester (midterm exams, 30% of the grade), and (b) at the end of the semester during the examination period (final exams, 70% of the grade). The midterm exams are compulsory.	

**(5) RECOMMENDED-BIBLIOGRAPHY**

<ul style="list-style-type: none"> <li>• Abadir &amp; Magnus (2005), Matrix Algebra (Econometric Exercises), Cambridge University Press.</li> <li>• de la Fuente (2000), Mathematical Methods and Models for Economists, Cambridge University Press, Cambridge.</li> <li>• Hoy, Livernois, McKenna, Rees &amp; Stengos (2001), Mathematics for Economics, MIT Press.</li> <li>• Klein (2002), Mathematical Methods for Economics, Addison-Wesley, 2nd Edition.</li> <li>• Simon &amp; Blume (1994), Mathematics for Economists, W. W. Norton &amp; Company.</li> <li>• Takayama (1985), Mathematical Economics, Cambridge University Press, Cambridge.</li> </ul>
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