

## COURSE OUTLINE

### (1) GENERAL

SCHOOL	School of Environment		
ACADEMIC UNIT	Department of Environment		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	401Y	SEMESTER	1
COURSE TITLE	Mathematics		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Laboratory exercises		3	
			5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	<a href="https://www.env.aegean.gr/all_courses/mathematics/">https://www.env.aegean.gr/all_courses/mathematics/</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> <li>• Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</li> <li>• Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</li> <li>• Guidelines for writing Learning Outcomes</li> </ul>
<p><b>The course aims to provide students with the necessary mathematical tools to analyze environmental problems.</b></p> <p><b>Upon successful completion of the course, students should be able to:</b></p> <ul style="list-style-type: none"> <li>• <b>Generalize key concepts of Calculus and develop a deeper understanding.</b></li> <li>• <b>Understand basic concepts of Linear Algebra, perform matrix operations, and solve linear systems of equations.</b></li> <li>• <b>Apply mathematical knowledge to solve problems.</b></li> </ul>
<p><b>General Competences</b></p> <p><i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <div style="display: flex; justify-content: space-between;"> <div> <p><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></p> <p><i>Adapting to new situations</i></p> <p><i>Decision-making</i></p> </div> <div> <p><i>Project planning and management</i></p> <p><i>Respect for difference and multiculturalism</i></p> <p><i>Respect for the natural environment</i></p> <p><i>Showing social, professional and ethical responsibility and</i></p> </div> </div>

<i>Working independently</i>	<i>sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Others...</i>
	<i>.....</i>
<p>Working independently</p> <p>Teamwork</p> <p>Working in an interdisciplinary environment</p> <p>Decision making</p> <p>Production of free, creative, and inductive thinking</p>	

### (3) SYLLABUS

The course is divided into the sections of Calculus and Linear Algebra. The Calculus section covers fundamental concepts such as limits, derivatives and integrals, while the Linear Algebra section focuses on matrices, determinants and systems of linear equations. The course includes introductory concepts and definitions as well as mathematical applications in physics and environmental sciences.

- Elements of Algebra and Trigonometry
- Sets and Functions
- Limits
- Derivatives and applications
- The Riemann integral, methods of integration
- Introduction to Differential Equations
- Functions of several real variables
- Elements of Linear Algebra

#### (4) TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Moodle (notes, presentations, quizzes, communication with students).	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i>  <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	13 weeks x 3 hours/week = 39
	Practice	13 weeks x 3 hours/week = 39
	Study	57
<b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i>  <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Total	
	135	
<b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure</i>  <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Language of evaluation: Greek	
	Evaluation Methods: <ul style="list-style-type: none"> <li>• Mid-term Exam</li> <li>• Final Exam</li> </ul>	

#### (5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Hass J., Heil C., Weir M. D. (2018) *Thomas Απειροστικός Λογισμός, Πανεπιστημιακές Εκδόσεις Κρήτης.*
- Briggs W. L., Cochran L., Gillett B. (2018), *Απειροστικός Λογισμός, Εκδόσεις Κριτική.*
- Χαράλαμπος Χ.Μ.Α., Φωτιάδης Α., 2015. *Μια εισαγωγή στη Γραμμική Άλγεβρα. Εκδόσεις Κάλλιπος ([www.kallipos.gr](http://www.kallipos.gr)).*
- *Lecture Notes (240 pages, in Greek - uploaded on Moodle)*