

## MODULE OUTLINE

### 1. GENERAL INFORMATION

<b>SCHOOL</b>	SCHOOL OF SCIENCE AND TECHNOLOGY		
<b>PROGRAM COURSE</b>	INFORMATICS		
<b>LEVEL OF STUDY</b>	UNDERGRADUATE		
<b>MODULE CODE</b>	PLI-12	<b>YEAR OF STUDY</b>	1 <sup>st</sup>
<b>MODULE TITLE</b>	Mathematics for Informatics I		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		<b>HOURS</b>	<b>CREDIS</b>
	Weekly teaching hours * 32 weeks	16-18	18 ECTS
<b>COURSE TYPE</b> <i>Background knowledge, Scientific expertise, General Knowledge, Skills Development</i>	Background knowledge, Scientific expertise Compulsory		
<b>PREREQUISITE MODULES:</b>	Selection or successful completion of PLI10 is recommended.		
<b>LANGUAGE OF INSTRUCTION AND EXAMS</b>	GREEK		
<b>THE MODULE IS OFFERED TO ERASMUS STUDENTS</b>	No (due to annual duration of the module)		
<b>MODULE WEBSITE (URL)</b>	<a href="https://www.eap.gr/education/undergraduate/computer-science/topics/#mathimatika_pliroforiki_1">https://www.eap.gr/education/undergraduate/computer-science/topics/#mathimatika_pliroforiki_1</a>  Each module has its own space in the Learning Management System of EAP ( <a href="http://study.eap.gr">http://study.eap.gr</a> ), with controlled access (use of code) for students and teaching staff.		

### 2. LEARNING OUTCOMES

<p><b>Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</li> </ul>
<p>On successful completion of the study:</p> <ol style="list-style-type: none"> <li>Students will expand their knowledge of the three areas of advanced mathematics which compose the syllabus of this course. They will be able to understand basic principles and theorems of Linear Algebra, Calculus of single variable and Probability Theory.</li> </ol>

2. They will acquire the necessary skills for applying advanced mathematics in order to develop critical thinking and analytical problem solving ability.
  3. Moreover, students will comprehend and evaluate the logical sequence of advanced mathematics, in particular to the role and construction of mathematical proofs and solutions in various problems.
- Finally, the students will be able to compose and apply the methods described in the syllabus in order to efficiently solve interdisciplinary problems and expand their knowledge in mathematical applications, especially on those relevant with computer science.

### **General Competences**

*Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?*

<i>Search for, analysis and synthesis of data and information by the use of appropriate technologies,</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for diversity and multiculturalism</i>
<i>Decision-making</i>	<i>Environmental awareness</i>
<i>Individual/Independent work</i>	<i>Social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Group/Team work</i>	<i>Critical thinking</i>
<i>Working in an international environment</i>	<i>Development of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment (Other.....citizenship, spiritual freedom, social</i>	<i>.....</i>
<i>Introduction of innovative research</i>	<i>awareness, altruism etc.) .....</i>

Search for, analysis and synthesis of data and information by the use of appropriate technologies,  
 Adapting to new situations  
 Decision-making  
 Individual/Independent work  
 Critical thinking  
 Development of free, creative and inductive thinking

### **3. MODULE CONTENT**

With the completion of this course, the students will be able to understand, interpret and describe fundamentals, while they will be able to solve various problems arising from other sciences, such as Physics, Chemistry, Biology etc. The mathematical instruction is necessary for two reasons: (a) students are familiarized with mathematics as the common language for all exact sciences, (b) students are trained on applying computer science methods for solving practical problems, as described in the syllabus, and (c) enables the students to acquire mathematical thinking which is based on demonstration of scientific results that is very important in informatics.

Subjects of this module:

1. Linear Algebra
2. Calculus of single variable
3. Computational Platforms (Matlab, Mathematica, Octave etc.) and Probability Theory/Statistics

#### 4. TEACHING METHODS--ASSESSMENT

<p><b>MODES OF DELIVERY</b> <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i></p>	<p>Distance education with five Group Counseling Meetings (OSS) during the academic year on weekends.</p>															
<p><b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b> <i>Use of ICT in teaching, Laboratory Education, Communication with students</i></p>	<p>We use :</p> <ul style="list-style-type: none"> <li>• Remote meetings tools (webex),</li> <li>• Presentation software (e.g. power point, beamer),</li> <li>• Presentations on whiteboard.</li> </ul> <p>Additionally, the students use office automation tools, web browsers and e-reader for digital books.</p>															
<p><b>MODULE DESIGN</b> <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc</i></p> <p><i>The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</i></p>	<table border="1"> <thead> <tr> <th><i>Activity</i></th> <th><i>Annual Workload</i></th> </tr> </thead> <tbody> <tr> <td>6 OSS (* 4 hours)</td> <td>24</td> </tr> <tr> <td>32 Horizontal tutorial OSS (* 2 hours)</td> <td>64</td> </tr> <tr> <td>Preparation of Assignments (5 assignments * 15 hours)</td> <td>75</td> </tr> <tr> <td>Examination</td> <td>3</td> </tr> <tr> <td>Individual study</td> <td>346-410</td> </tr> <tr> <td><b>Total module workload (hours)</b></td> <td><b>512-576</b></td> </tr> </tbody> </table>		<i>Activity</i>	<i>Annual Workload</i>	6 OSS (* 4 hours)	24	32 Horizontal tutorial OSS (* 2 hours)	64	Preparation of Assignments (5 assignments * 15 hours)	75	Examination	3	Individual study	346-410	<b>Total module workload (hours)</b>	<b>512-576</b>
<i>Activity</i>	<i>Annual Workload</i>															
6 OSS (* 4 hours)	24															
32 Horizontal tutorial OSS (* 2 hours)	64															
Preparation of Assignments (5 assignments * 15 hours)	75															
Examination	3															
Individual study	346-410															
<b>Total module workload (hours)</b>	<b>512-576</b>															
<p><b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b> <i>Detailed description of the evaluation procedures.</i></p> <p><i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i></p>	<p>Elaboration of written assignments in Greek during the academic year. The average of the grades participates in the formation of the final grade of module by 30%, if there is a passable grade in the final or repetitive exams. The grade of the final or repetitive exams participates in the formation of the final grade of the module by 70%. The students can be optionally examined in the Linear Algebra material in the optional examination of the module.</p> <p>In this module, an optional examination is also performed, examining the Linear Algebra material, while succeeded grade is considered only in the final exams (if the student approves it).</p>															

<p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students</i></p>	<p>All the criteria are posted, both in each written assignment (in the LMS study.eap.gr), as well as in the general regulation of HOU at:  <a href="https://www.eap.gr/education/study-regulations/">https://www.eap.gr/education/study-regulations/</a></p>
--	---

## **(6) SUGGESTED BIBLIOGRAPHY**

<p><i>- Suggested bibliography:</i></p> <p>HOU Publications:</p> <p>Volume A': Linear Algebra, HOU, Patras 2004. FYE20/1  Volume B': One Variable Calculus, HOU, Patras 1999. FYE10/1  Volume A': Probabilities and Statistics I, HOU, Patras, 2000. DIP50/1</p> <p>Additional digital (and multimedia) material is available within the "study" platform.</p> <p><i>-Related scientific Journals:</i></p> <ol style="list-style-type: none"> <li>1) Linear Algebra and its Applications, Elsevier, ISSN: 0024-3795</li> <li>2) Linear and Multilinear Algebra, Taylor &amp; Francis, ISSN: 0308-1087</li> <li>3) Computers &amp; Mathematics with Applications, Elsevier, ISSN: 0898-1221</li> <li>4) Journal of Combinatorial Theory, Series A, Elsevier, ISSN: 0097-3165</li> </ol>
--