

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	2601001	SEMESTER	1
COURSE TITLE	Mathematics I		
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 (ECTS)	
Lectures	4	6	
Laboratory	0		
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	General Background Course		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	http://vplace.teipir.gr/hn_math1		

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

Upon successful completion of this course module students possess advanced knowledge, skills and competences in the subject of Mathematics that enable them to:

1. Solve linear systems of equations using Linear Algebra;
2. Solve linear systems of equations with complex numbers;
3. Know and be able to explain by sketching the physical meaning of derivatives and integrals;
4. Apply taught methods to calculate integrals; use derivatives and integrals to solve problems in physics / mechanics;
5. Apply taught methodology in problem solving of other fields of science and technology, in real life contexts;
6. Use vector analysis and its basic operations (inner product, angle, external product, etc) in analyzing problems and synthesizing solutions;
7. Assess different methods for the synthesis of solutions to real-life problems and select the

appropriate for the problem at hand;
 8. Work in a group on analyzing and solving problems given as group assignments during the semester.

General Competences	
<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>	
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and 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>Production of new research ideas</i>	<i>Others...</i>

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work

(3) COURSE CONTENT

- Lectures:
1. Introduction to Vector Analysis.
 2. Inner product, external product, angle, vector measure.
 3. Basic laws of complex numbers.
 4. Calculations in complex numbers.
 5. The N-th roots of unity.
 6. The N-th roots of a complex number.
 7. Calculating powers of complex numbers.
 8. Introduction to matrices.
 9. Solution of linear systems of equations using Cramer Method.
 10. Solution of linear systems of equations using Gauss Elimination Method.
 11. Basic laws of derivatives.
 12. Introduction to integrals and basics calculating methods.
 13. Integrated problems solving; applications in physics and mechanics; real-life problems addressed through derivatives and integrals.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face lectures
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> • Use of electronic presentation with multimedia content in class, • Student support through the course webpage and the departmental e-learning platform, • Electronic communication of instructors and students, through the course webpage and by e-mail.
TEACHING METHODS	Lectures, assignments, study.

The manner and methods of teaching are described in detail.

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.

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

Activity	Semester workload (hours)
Lectures	52
Study for lectures	52
Homework Assignments	52
Study and preparation for exam	24
Course Total	180

STUDENT PERFORMANCE EVALUATION

Description of the evaluation procedure

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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

Student evaluation is performed in the language of instruction.

Final written exam on all taught material (70%)
Homework Assignments turned in during the semester (30%)

(5) ATTACHED BIBLIOGRAPHY

Essential reading

1. "Mathematics I". E. Katopodis, A. Makrigiannis, S. Sassalos (in Greek).
2. "Mathematics I" D. Anastasatos, (in Greek).

Recommended Books

Linear Algebra, G. Strang.