

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	13	SEMESTER	1
COURSE TITLE	LINEAR ALGEBRA AND ELEMENTS OF ANALYTICAL GEOMETRY		
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	
	5	6	
<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		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (Greek)		
COURSE WEBSITE (URL)	http://ecourse.uoi.gr/course/view.php?id=906		

(2) LEARNING OUTCOMES

<p>Learning outcomes <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><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>This course is an introduction to Linear Algebra and Analytical Geometry. After successful completion the students should be able to:</p> <ul style="list-style-type: none"> ● recall the basic types of matrices ● calculate determinants of matrices ● solve systems of linear equations ● find eigenvalues and eigenvectors of matrices

- diagonalize matrices
- recall and use the basics of vector algebra
- identify and characterize conic sections
- be able to write equations of lines, circles, planes and spheres
- determine the relative position of lines and planes
- be able to find the distance between points, lines and planes
- recall and use the basics of complex number algebra.

General Competences

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

Others...

Decision-making, Production of free, creative and inductive thinking.

(3) SYLLABUS

Basic vector algebra. Matrices, determinants, solution of system of linear equations.

Eigenvalues, eigenvectors, diagonalization of matrices with examples from Physics. Algebra of complex numbers, Euler's formula, root determination, applications. Basic concepts of Analytical geometry in Cartesian and polar coordinates. Equations of line, conic sections, plane and sphere. Equations of second degree on the plane and in three-dimensional space.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face	
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	The Moodle system is used in order to supply notes and exercises to students.	
<p>TEACHING METHODS <i>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.</i></p> <p><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></p>	<p>Activity</p>	<p>Semester workload</p>
	Lectures	106
	Study and analysis of bibliography	40
	Exams	4
Course total	150	
<p>STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p> <p><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></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	Written exam after completion of lectures	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography: (in Greek)

Γραμμική Άλγεβρα και Αναλυτική Γεωμετρία, Μυλωνάς Νίκος, 2013, Α. ΤΖΙΟΛΑΣ & ΥΙΟΙ, ISBN: 978-960-418-427-9

Γραμμική Άλγεβρα, Θ. Ξένος, 2004, Ζήτη Πελαγία, ISBN: 960-431-904-3

Αναλυτική Γεωμετρία, Θ. Ξένος, 2004, Ζήτη Πελαγία, ISBN: 960-431-915-9

Μαθηματικά Ι (τ. Α') Άλγεβρα - Αναλυτική Γεωμετρία, Κατωπόδης Επ., Μακρυγιάννης Αρ., Σάσσαλος Σπ, 1994, ΣΥΓΧΡΟΝΗ ΕΚΔΟΤΙΚΗ ΕΠΕ, ISBN: 978-960-7344-32-8