COURSE OUTLINE

GENERAL

SCHOOL	School of Science
ACADEMIC UNIT	Department of Mathematics
LEVEL OF STUDIES	Undergraduate

COURSE CODE	MAY121		**SEMESTER**	1st SEMESTER
COURSE TITLE	LINEAR ALGEBPA I			

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
	5	7.5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://sites.google.com/site/apostolosthomamath/teaching/linear-algebra-1

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*
After finsihing the course, the students will be able

i) to use matrices as a tool in theoretical or numerical computations

ii) to compute the rank of a matrix

iii) to compute determinants

iv) to solve linear systems of equations

v) to understand and use the notion of vector space

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

The aim of the course is to enpower the graduate to analyse and compose basic notions and knowledge of Linear Algebra and advance his creative and productive thinking.

SYLLABUS

The algebra of (m x n) matrices and applications.

Row echelon forms and reduced row echelon form of a matrix

Rank of a matrix. Determinants. Invertible matrices

Linear systems and applications

Vector spaces. Linear maps

The space L(E,F) of linear operations.

Subspaces. Bases. Dimension. Rank of a linear operation.

Fundamental equation of dimension and its applications. Matrix of a linear map. Matrix of a change of bases. The isomorphism between linear maps and matrices. Equivalent matrices. Similar matrices. Determinant of an endomorphism. Sum and direct sum of vector subspaces.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	

TEACHING METHODS *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*
	Lectures	65 hours
	Study of тheory and solving of exercises	32.5 hours
	Course total	*97.5 hours*

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer*	Written examination in the end of the semester in Greek with open.ended and problem solving questions.

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.	

ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*
- *Related academic journals:*

ΕΙΣΑΓΩΓΗ ΣΤΗ ΓΡΑΜΜΙΚΗ ΑΛΓΕΒΡΑ, 2010
ΜΠΟΖΑΠΑΛΙΔΗΣ ΣΥΜΕΩΝ,
ISBN: 978-960-99293-5-6
(Εκδότης): ΧΑΡΑΛΑΜΠΟΣ ΝΙΚ. ΑΪΒΑΖΗΣ

(Translation: Introduction to Linear Algebra (Greek), Bozapalidis Symeon, ISBN: 978-960-99293-5-6 (Editor): Charalambos Nik. Aivazis)

ΜΙΑ ΕΙΣΑΓΩΓΗ ΣΤΗ ΓΡΑΜΜΙΚΗ ΑΛΓΕΒΡΑ, 2012,
ΒΑΡΣΟΣ ΔΗΜΗΤΡΗΣ, ΔΕΡΙΖΙΩΤΗΣ ΔΗΜΗΤΡΗΣ,
ΕΜΜΑΝΟΥΗΛ ΓΙΑΝΝΗΣ, ΜΑΛΙΑΚΑΣ ΜΗΧΑΛΗΣ,
ΜΕΛΑΣ ΑΝΤΩΝΗΣ, ΤΑΛΕΛΛΗ ΟΛΥΜΠΙΑ
ISBN: 978-960-6706-36-3
(Εκδότης): ″σοφία″ Ανώνυμη Εκδοτική & Εμπορική Εταιρεία

(Translation: An Introduction to Linear Algebra, 2012, (Greek) Varsos Dimitris, Deriziwtis Dimitris, Emmanouil Giannis, Maliakas Mixalis, Melas Antonios, Talleli Olympia ISBN: 978-960-6706-36-3 (Editor): "Sofia" Editions)

Εισαγωγή στη ΓΡΑΜΜΙΚΗ ΑΛΓΕΒΡΑ. 2006
Θεοδώρα Θεοχάρη-Αποστολίδη, Χαρά Χαραλάμπους, Χαρίλαος Βαβατσούλας ISBN: 960-631-094-9
(Εκδότης): ΧΑΡΑ ΧΑΡΑΛΑΜΠΟΥΣ

(translation: Introduction to LINEAR ALGEBRA, 2006, (Greek) Theodora Theochari, Hara Haralambous, Charilaos Vavatsoulas, ISBN: 960-631-094-9, (Editor): Hara Charalambous)