

COURSE OUTLINE

(1) GENERAL

SCHOOL	Department of Informatics and Computer Engineering		
ACADEMIC UNIT	University of West Attica		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE		SEMESTER	A
COURSE TITLE	Linear Algebra		
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
	Lectures	2	
	Tutorials	2	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		4	4
COURSE TYPE general background, special background, specialised general knowledge, skills development	General Background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/ICE257/		

(2) LEARNING OUTCOMES

<p>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</p> <ul style="list-style-type: none"> • 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 			
<p>The aim of the course is the development of basic issues of Linear Algebra that apply in many science subjects and in particular in the Computer Science. The students should be able to comprehend the basic concepts and techniques of Linear Algebra in order to deal with several applied problems that might occur in related mathematical (Geometry, Arithmetical Analysis) or other scientific fields (Statistics, Economy, Optimisation etc.). A selection of appropriate exercises and projects will assist the students of the Department to make use of these concepts and to further develop them.</p>			
<p>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?</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> 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 </td> <td style="width: 50%; border: none;"> 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 </td> </tr> </table>		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	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
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Working in an interdisciplinary environment Production of new research ideas	Others...
<p>Search for, analysis and synthesis of data and information, with the use of the necessary technology</p> <p>Decision-making</p> <p>Working independently</p> <p>Team work</p> <p>Working in an international environment</p> <p>Respect for difference and multiculturalism</p> <p>Production of free, creative and inductive thinking</p>	

(3) SYLLABUS

- Introduction to fundamental notions of Linear Algebra: Vector, Matrix, operations
- Vector Spaces: Vector space, vector subspace, span, base, orthogonal base
- Euclidean vector spaces, Schwarz inequality, Pythagorean theorem
- Change of base. Gram-Schmidt orthogonalisation.
- Linear transformations
- Linear systems
- Invariant subspaces, Eigenvectors, Eigenvalues and Eigenspaces.
- Matrix similarity. Triagonalisation and diagonalisation.
- Least Square Method as an orthogonal projection

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY , Distance learning, etc.	Face-to-face																		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of ICT in teaching, communication with students																		
<p>TEACHING METHODS</p> <p>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.</p> <p>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</p>	<table border="1"> <thead> <tr> <th>Activity</th> <th>Semester workload</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>26</td> </tr> <tr> <td>Tutorials</td> <td>26</td> </tr> <tr> <td>Project</td> <td>20</td> </tr> <tr> <td>Non-directed study</td> <td>28</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>Course total</td> <td>100</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures	26	Tutorials	26	Project	20	Non-directed study	28							Course total	100
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<p>STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>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</p> <p>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>Written examinations with open questions in Greek language.</p> <p>Every question in the exam paper has a mark weight that is announced in advance to the students.</p>																		

(5) ATTACHED BIBLIOGRAPHY

1. Γλαμπεδάκης, Μ. Γλαμπεδάκης Α. (2014). Γραμμική Άλγεβρα. Εκδ Ιων.
2. Χ. Π. Κίτσος (2011) Τεχνολογικά Μαθηματικά και Στατιστική Ι. Εκδ. Νέων Τεχνολογιών.
3. Μασούρος, Χ. , Τσίτουρας, Χ. (2017) ΜΑΘΗΜΑΤΙΚΑ ΙΙ, Εκδόσεις Τσόδρας
4. Amir-Moez, A. R, and Fass, A. L. (1962). Elements of Linear Spaces. Pergamon Press.
5. Παπαγεωργίου, Γ., Τσίτουρας, Χ., Φαμέλης, Ι. (2004). Σύγχρονο Μαθηματικό Λογισμικό MATLAB-MATHEMATICA. Εκδόσεις Συμεών .
6. Steven J.L. (2006), Linear Algebra With Applications (7th ed.), Pearson Prentice Hall.
7. Sheldon, A. (2004), Linear Algebra Done Right (2nd ed.). Springer