COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF SCIENCE		
DEPARTMENT	COMPUTER SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	302EYYK	**SEMESTER**	**3rd**
COURSE TITLE	SCIENTIFIC COMPUTATION		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lecture	2	4
Laboratory Exercises	1	
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	General Background
PREREQUISITES:	No
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	No
COURSE URL:	-

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The purpose of the course is to introduce the students to scientific computation with the help of computer tools (such as Mathematica, MATLAB, Octave, etc.), so that they are equipped with the necessary knowledge and ability to solve computational problems that they need during their studies in many courses, but also more generally in their subsequent professional or scientific activity. The students must learn to use the computational tool, i.e. its basic functions, structures and philosophy, with the method of progressive problem solving, so that they are able to pose and solve computational problems in various fields of science and technology.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Work in an international environment
- Promotion of free, creative, and inductive thinking

3. COURSE CONTENT

1. Basic Concepts of Computer Programming
2. Introduction to the MATLAB program
3. Data types, operators, Variables, Constants, Functions
4. Tables and Vectors
5. Set theory in MATLAB
6. Select and repeat commands
7. User functions. Function Handles
8. Solving equations in MATLAB
9. Tables of characters, Strings
10. Multidimensional Arrays, Cell Arrays
11. 2D and 3D graphics
12. Graphics Options

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Presentation both in Theory and in the Laboratory with the help of slides, Website of the course with supporting and auxiliary material, application of Simulation Software, communication by e-mail
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	***Activity*** — ***Workload/semester*** Lectures — 26 x 2 = 52 hours Laboratory Exercises — 13 x 1 = 13 hours Exams — 2 x 1 = 2 hours Independent Study — 33 hours **Total — 100 hours**
STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	Final exam (100%) including: I. Theoretical part II. Problem solving Laboratory Course: I. Individual Assignments (25%) II. Mid-term exam on the taught material (25%). III. Final Examination on the rest of the material (50%).

5. SUGGESTED BIBLIOGRAPHY

1. Το MATLAB στην Υπολογιστική Επιστήμη και Τεχνολογία - Μια Εισαγωγή. Charles F. Van Loan & K.-Y. Daisy Fan. Εκδόσεις DaVinci, ISBN : 978-960-973-200-0. Κωδικός Βιβλίου στον Εύδοξο: 22767853.
2. Matlab, πρακτική εισαγωγή στον προγραμματισμό και την επίλυση προβλημάτων. STORMY ATTAWAY, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ, ISBN : 978-960-461-663-3. Κωδικός Βιβλίου στον Εύδοξο: 50656337
3. Προγραμματίζοντας σε matlab. Στεφανάκος Χ.Ν. Εκδότης ΣΥΜΜΕΤΡΙΑ, ISBN: 978-960-266-349-3. Κωδικός Βιβλίου στον Εύδοξο: 12979024
4. MATLAB Εισαγωγή και εφαρμογές για Μηχανικούς. Κ. Παπαοδυσσεύς – Κ. Καλοβρέκτης – Ν.

Μυλωνάς. ΕΚΔΟΣΕΙΣ ΤΖΙΟΛΑ, ISBN: 978-960-418-656-3
5. MATLAB® Primer, R2019a, by MathWorks
https://www.mathworks.com/help/releases/R2019a/pdf_doc/matlab/getstart.pdf