

COURSE OUTLINE

1. GENERAL

SCHOOL	NATURAL SCIENCES		
DEPARTMENT	MATHEMATICS		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	MAT_IC102	SEMESTER OF STUDIES	1 st
COURSE TITLE	INTRODUCTION TO COMPUTERS AND PROGRAMMING WITH FORTRAN		
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>		TEACHING HOURS PER WEEK	ECTS CREDITS
Lectures and Laboratory Exercises		5	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Background		
PREREQUISITE COURSES:	None		
TEACHING AND ASSESSMENT LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)	https://eclass.upatras.gr/courses/MATH919/ https://eclass.upatras.gr/courses/MATH973/		

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

By attending this course the student will understand the meaning of designing and implementing algorithms in order to solve problems. At the end of the course the student will have further developed the following skills:

- To detect the necessary data objects (given and asked) for the natural representation of a problem.
- To design the algorithm required for solving the problem.
- To find the commands/structures of Fortran 90 corresponding to the commands/structures that are used in the designed algorithm.
- To combine the commands/structures required for building a program in order to solve the problem.
- To evaluate the results of the solution.

After attending this course successfully, the student will be able to design a proper algorithm for solving a well-defined problem and implement this algorithm in the Fortran 90 programming language.

General Abilities

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...

- Search, analyze and synthesize data and information, using the necessary technologies.
- Autonomous work.

3. COURSE CONTENT

(i) Introduction to computers: introductory concepts of computer architecture, introduction to Unix and Microsoft Windows operating systems. **(ii)** Basic principles of procedure-oriented programming: designing, implementing and correcting programs, data types, and program flow control. **(iii)** Fortran 90 programming language: declarations, assign statement, control and repetition statements, input/output statements, static and dynamic arrays, subroutines and functions and their role in the structure of a program.

Laboratory exercises: Familiarization to Unix and Microsoft Windows operating systems, Microsoft Office and the Internet. Solution of mathematical problems by using Fortran 90.

In order to highlight the special educational and didactical aspects of a course, special emphasis is given on the historical evolution and scientific development of the subject as well as on its applications in technology and/or other sciences.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

<p>TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i></p>	Lectures (face to face)	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	The laboratory exercises and the assignments are implemented by using Fortran 90 under Unix and Microsoft Windows operating systems. The assignments are written by using Microsoft Word. The learning procedure is supported by the eClass platform of University of Patras.	
<p>TEACHING ORGANIZATION <i>The manner and methods of teaching are described in detail.</i></p> <p><i>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 του ECTS</i></p>	Activity	Semester workload
	Lectures	39
	Laboratory exercises	26
	Working on assignments	55
	Private study of the student	50
	Laboratory examination	2
	Final examination	3
Total number of hours for the Course (25 hours of work-load per ECTS credit)	175	
<p>STUDENT ASSESSEMENT <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>	<p>Assessment Language: Greek Assessment Language for Erasmus students: English</p> <p>Assessment methods</p> <ul style="list-style-type: none"> ✓ Assignments ✓ Laboratory examination ✓ Final examination <p>Minimum passing grade: 5 Maximum passing grade: 10</p>	

5. RECOMMENDED LITERATURE

<p><i>(in Greek)</i></p> <ul style="list-style-type: none"> • Γράφα Θεοδούλα. <i>Προγραμματίζοντας με Fortran 90</i>. Εκδόσεις Τζιόλα, 2012. • Κλημόπουλος Στέργιος και Τσουροπλής Αθανάσιος. <i>Από τη FORTRAN 77 στη FORTRAN 90</i>. Εκδόσεις Νέων Τεχνολογιών, 2001. • Καραμπετάκης Νικόλαος. <i>Εισαγωγή στην Fortran 90/95/2003</i>. 2^η Έκδοση, Εκδόσεις Ζήτη, 2011.
