

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	POSTGRADUATE Studies in Mathematics		
COURSE CODE	C4	SEMESTER	
COURSE TITLE	MATHEMATICAL SOFTWARE		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS	
	3	10	
COURSE TYPE	SPECIALISED GENERAL KNOWLEDGE		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	http://www.math.aegean.gr/index.php/en/academics/undergraduate-programs		

(2) LEARNING OUTCOMES

Learning outcomes
This course aims at the enhancement of the programming skills of students by introducing them to programming techniques with Fortran 90/95 and mathematical software MATLAB where emphasis is given onto the solution of problems with arithmetic methods and mathematical modelling of problems that a mathematician is to face with.
General Competences
Searching for, analysis and synthesis of data and information, with the use of the necessary technology. Working independently, Working in an international environment, Working in an interdisciplinary environment

(3) SYLLABUS

<p>Introduction to problem modelling, algorithms and computational methods.</p> <p>First Part: Introduction to the Fortran 90/95. Program Structure, variables, expressions. Flow control commands (decision and iterations). Arrays. Subroutines, modules and interconnections. Files. Implementation of algorithms. Recursion. Data abstraction. Pointers and dynamic memory allocation. Graphics.</p> <p>Second Part: Introduction to basic structures (front-end, kernel, notebooks, variables, data types, arithmetic computations, symbolic computations, graphic presentations), to script programming and to the use of functions of MATLAB.</p> <p>Solution of computational problems from several fields of mathematics (calculus, algebra, and geometry) and undertaking two laboratory works using Fortran and MATLAB.</p>
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(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face										
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none">• Use of slides and Interactive whiteboard during the course.• Communication with students via e-mail.• Use of eLearning platform.										
TEACHING METHODS	<table border="1"><thead><tr><th><i>Activity</i></th><th><i>Semester workload</i></th></tr></thead><tbody><tr><td>Lectures</td><td>39</td></tr><tr><td>Independent study</td><td>148.5</td></tr><tr><td>Assignments</td><td>62.5</td></tr><tr><td>Course total (25 per ECTS)</td><td>250</td></tr></tbody></table>	<i>Activity</i>	<i>Semester workload</i>	Lectures	39	Independent study	148.5	Assignments	62.5	Course total (25 per ECTS)	250
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	Lectures	39									
	Independent study	148.5									
	Assignments	62.5									
Course total (25 per ECTS)	250										
STUDENT PERFORMANCE EVALUATION	Student evaluation is done in Greek through a written examination which includes short-answer equations and problem solving as well. For students with disabilities, evaluation takes place via oral exams.										

(5) ATTACHED BIBLIOGRAPHY

1. N. Karabetakis, Introduction to Fortran 90/95, Ziti Editions, 2002.
2. M. Metcalf και J. Reid, Fortran 90/95 Explained (2nd edition), Oxford University Press, 1999.
3. Electronic Notes at eclass platform <http://cms.math.aegean.gr/>.