

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE PROGRAM		
COURSE CODE		SEMESTER	D
COURSE TITLE	CALCULUS IV		
INSTRUCTOR	Nikolaos Dafnis		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
		6	9
COURSE TYPE	General background		
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
<p>Knowledge of the notion of integration on two and three-dimensional domains. Ability to calculate double and triple integrals. Application of these integrals in the computation of volume, center of mass, etc.</p> <p>Understanding of the notion of the line integral (of first and second kind) and ability to calculate it.</p> <p>Understanding of the notion of the surface integral and ability to calculate it.</p> <p>Knowledge and understanding of the basic theorems of vector calculus (Green, Gauss, Stokes) and ability to apply them in problem solving.</p>
General Competences
Working independently. Team working. Working in an interdisciplinary environment. Production of free, creative and inductive thinking.

(3) SYLLABUS

<p>Vector calculus. Double integrals. Properties. Integration. Successive integration.</p> <p>Jacobian determinant. Change of variables. Polar coordinates.</p> <p>Green's Theorem on a plane and applications. Physical meaning of curl and divergence of a vector field.</p> <p>Triple integrals. Properties. Change of variables. Polar and spherical coordinates. Applications in physics.</p> <p>Line and surface integrals. Parameterization of surfaces. Area of a surface. Properties of surface integrals. Surface integrals of vector fields.</p> <p>Green's theorem in three dimensions. Stoke's theorem. Conservative vector fields. Gauss's theorem. Application in physics and in partial differential equations.</p>	
TEACHING MATERIAL	The teaching material of the course is uniformly distributed during the

DISTRIBUTION	semester.
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(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face lectures	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Communication with students via e-mail	
TEACHING METHODS	Activity	Semester workload
	Lectures	52
	Tutorials	26
	Independent study	147
	Course total (25 per ECTS)	225
COURSE COMMITMENTS	Attending course and tutorial sessions is not obligatory.	
STUDENT PERFORMANCE EVALUATION	Student's evaluation is done in Greek through a written examination which includes short-answers questions and problem solving. For students with disabilities, evaluation takes place via oral exams.	

(5) ATTACHED BIBLIOGRAPHY

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| <ol style="list-style-type: none"> 1. Vector Calculus, Marsden J., Tromba A. 2. Calculus, Vol II, Finney R.L., Weir M.D., Giordano F.R. |
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