

COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
ACADEMIC UNIT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	2302507	SEMESTER	2 ⁰
COURSE TITLE	MATHEMATICS II		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS	
<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>			
Lectures	4	7	
Laboratory	2		
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE	General Background Course		
<i>general background, special background, specialised general knowledge, skills development</i>			
PREREQUISITE COURSES:	YES (MATHEMATICS I)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (official)		
IS THE COURSE OFFERED TO ERASMUS STUDENTS			
COURSE WEBSITE (URL)	vplace.teipir.gr/pde_math2		

(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

MATHEMATICS II aims to enrich students' abilities in the use of functions of many variables and their integrals, as well to recognize, classify and solve differential equations thus gaining a solid background for their endeavors in their discipline.

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment
Production of new research ideas	Others...

- 1) Search, analysis and synthesis of data and information, using the necessary technologies.
- 2) Decision Making.
- 3) Autonomous work.

(3) SYLLABUS

- MATHEMATICAL ANALYSIS II

The Euclidean space R^n . Functions between Euclidean spaces, limit and continuity of functions. Differentiation of vector-valued functions of a single variable, applications in mechanics and differential geometry, polar, cylindrical and spherical coordinates. Differentiable functions, partial and directional derivative, the concept of differential. Vector fields, gradient-divergence-curl. Fundamental theorems of differentiable functions (mean value theorem, Taylor). Inverse function theorem. Implicit function theorems. Functional dependence. Local and conditional extremes. Double and triple integrals: definitions, integrability criteria, properties. Change of variables, applications. Contour integrals: Contour integral of the first and second kind, contour integrals independent of path, Green's Theorem.

- DIFFERENTIAL EQUATIONS

Introduction to differential equations (definitions). First order differential equations (separable variables, total differential and Euler multiplier, linear, Bernoulli, homogeneous Riccati). Qualitative theory of differential equations (general). Higher order linear differential equations (general theory). Linear differential with constant coefficients (solution of linear equations, variation of parameter method, method of undetermined coefficient's, Euler's differential equations, applications).

- MATLAB.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Lectures and exercises, face-to-face.	
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ol style="list-style-type: none"> 1. Teaching using ICT(MATLAB) 2. Communication and Electronic Submission. 	
<p>TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <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</i></p>	Activity	Semester workload
	Lectures	52
	Laboratory Exercises	26
	Preparation for Writing laboratory reports-homework.	15
	Preparation for Homework on case studies(individual or group work)	14
	Personal study	68
	Course total	175
<p>STUDENT PERFORMANCE EVALUATION <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>Written examination: 60%</p> <p>Laboratory exercise: 40%</p> <p>Optional job preparation and presentation of up to 24%, less than the proportion of written examination</p>	

(5) ATTACHED BIBLIOGRAPHY

<ol style="list-style-type: none"> 1. "Differential Equations", Y. Georgoudis, A. Paliatsos, N. Prezerakos. Publications: "Sunhroni Ekdotiki", Eudoxos code 6836, (in Greek). 2. "Differential Equations" Anastasatos, Theodorou, Kouris, Ndrigogias. Publications: "Diros publications", Eudoxos code 47299, (in Greek). 3. "Functions of many variables", Y. Georgoudis, A. Makrugiannis, S. Sassalos. Publications: "Synhroni Ekdotiki" Eudoxos code 6833, (in Greek).
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