■ CC33 - Ordinary Differential Equations

GENERAL

SCHOOL	EXACT SCIENCES		
DEPARTMENT	MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CC33	**SEMESTER**	C
COURSE TITLE	ORDINARY DIFFERENTIAL EQUATIONS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures	4	7

COURSE TYPE	Scientific Field
PREREQUISITE COURSES	-
LANGUAGE OF TEACHING AND EXAMINATIONS	Greek/English
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://eclass.uowm.gr/

LEARNING OUTCOMES

Learning Outcomes
Upon successful completion of the course, the students: • will be able to know the classification of Ordinary Differential Equations, • will be able to solve special forms of 1st and 2nd order differential equations, • will be able to apply an approximate method for solving 1st order differential equations that do not have an analytical solution, • will have understood the matrix method for solving systems of differential equations, • will have encounter problems of other scientific fields, the processing of which

depends on the construction and solution of appropriate differential equations.
General Competencies
• Familiarity with the use of the differential function. • Understanding the need to use numerical methods. • Promotion of inductive thinking.

CONTENT OF THE COURSE

The general linear equation of the first order. Linear equations with constant coefficients. Linear equations with variable coefficients. Linear equations with regular singular points. Existence and uniqueness of solutions to first order equations: equations with variables separated, exact equations, the method of successive approximations, the Lipschitz condition, convergence of the successive approximations. Non-local existence of solutions. Approximations to, and uniqueness of, solutions. Existence and uniqueness of solutions to systems and n-th order equations.

TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD	In the classroom.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	E-Lectures. Use of e-class. Communication through face-to-face discussions and e-mails.
TEACHING ORGANIZATION	

Activity	Semester Workload
Lectures	52 hours
Projects	43 hours
Indivisual Study	80 hours
Course Total (25 hours per ECTS)	175 hours

STUDENT EVALUATION	Projects 20%. Written final examination 80%.

RECOMMENDED BIBLIOGRAPHY

1. Ordinary Differential Equations, G. Dasios (1991)
2. Differential Equations, Kyventidis Thomas A. Publications ZITI (2012). (Greek)
3. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce - R.C. Di Prima. Publications NATIONAL TECHNICAL UNIVERSITY OF ATHENS OE (2015). (Greek)
4. Introduction to Differential Equations, Logan David. LIBERAL BOOKS Publications (2014). (Greek)
5. Ordinary differential equations (2^{nd} edition), Nikolaos Alikakos, Grigoris Kalogeropoulos. Publications SYCHRONI EDTOTIKI (2019). (Greek)