GENERAL

SCHOOL	School of Science			
ACADEMIC UNIT	Department of Mathematics			
LEVEL OF STUDIES	Undergraduate			
COURSE CODE	MAE613		**SEMESTER**	Spring (6th)
COURSE TITLE	Integral Equations			

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
	3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	Through the platform "E-course" of the University of Ioannina

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*
The course aims to an introduction to the area of Integral Equations. Students are expected to obtain basic knowledge on standard types of integral equations, learn how to solve certain linear integral equations, also study existence and uniqueness of solutions

by the use of fixed point theorems.

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*
	Respect for difference and multiculturalism
	Respect for the natural environment
Adapting to new situations	*Showing social, professional and ethical*
Decision-making	*responsibility and sensitivity to gender issues*
Working independently	*Criticism and self-criticism*
Team work	*Production of free, creative and inductive*
Working in an international environment	*thinking*
Working in an interdisciplinary environment	*Others*
Production of new research ideas	

Working independently
Team work
Production of free, creative and inductive thinking
Production of analytic and synthetic thinking

SYLLABUS

An introduction with historical notes. Classification of Integral Equations. Problems leading to integral equations. Laplace transformations and their use to solving integral equations. Other integral transformations. Volterra integral equations: Neumann series, successive approximations, Laplace transformation and the convolution kernel. Fredholm integral equations: Symmetric kernels, separated kernels, Fredholm Alternative, classical Fredholm theory. Green functions for second order boundary value problems. Existence and uniqueness of solutions: Banach spaces, contractions and applications to integral equations. Existence of solutions by Schauder's theorem.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures. Presentations in class.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of the platform "E-course" of the University of Ioannina

TEACHING METHODS	Activity	Semester workload
The manner and methods of teaching are described in detail. 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.	Lectures/Presentations	45
	Assignments	15
	Individual study	90
	Course total	*150*

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

STUDENT PERFORMANCE EVALUATION	
Description of the evaluation procedure *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*	Students choose evaluation by one or both of the following: 1. Class presentation – Essays – Assingments 2. Final Written Examination In case that a student participates to both, the final grade is the maximum of the two grades.
Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Evaluation criteria and all steps of the evaluation procedure are accessible to students through the platform "E-course" of the University of Ioannina.

ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:
Σ. Ντούγια, Ολοκληρωτικές Εξισώσεις
C. Corduneanu, Principles of Differential and Integral Equations

Mathematical Journals