ETE601 – Complex analysis

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING			
ACADEMIC UNIT	DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING			
LEVEL OF STUDIES	UNDERGRADUATE			
COURSE CODE	ETE601	**SEMESTER**	6	
COURSE TITLE	Complex analysis			
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**
Lectures / Case Studies			3	3
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).				
COURSE TYPE *general background, special background, specialized general knowledge, skills development*	specialized general knowledge			
PREREQUISITE COURSES:	No special prerequisite courses. But knowledge on linear algebra and differential and integral calculus are helpful			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	LECTURES IN GREEK			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO			
COURSE WEBSITE (URL)	http://medlab.cc.uoi.gr/?page_id=8938			

(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*

Complex Analysis is a central subject of mathematics and a powerful tool in solving physical problems that are particularly difficult or practically impossible to solve otherwise.

The course is an introduction to complex analysis and its applications and covers the analytic functions, integration, series and integral balances, as well as applications in vector calculus, transformations and the solution of differential equations.

- The aim of the course is to provide the student with mathematical techniques suitable for the study and solution of demanding physical and technical problems in the field of engineering science.

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 *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
The knowledge gained from the course contributes to the development of mathematical skills suitable for: o The solution of difficult physical problems o Facilitating complex scientific calculations o Work in an interdisciplinary environment o Production of new research ideas	

(3) SYLLABUS

Complex numbers.
Analytic Functions.
Elementary Functions.
Integrals. Series and continuous functions.
Holomorphic functions
Complex Integration.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face in the class using whiteboard and presentations
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of PC for presentation and information.
TEACHING METHODS *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.* *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*	***Activity*** / ***Semester workload*** Lectures: 39 Homework: 36 Course total: 75
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* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	METHOD OF EVALUATION: • Written exam at the end of the semester based on the theory and exercises presented during the course. • Homework during the semester

(5) ATTACHED BIBLIOGRAPHY

Suggested bibliography:

- Ablowitz, M.J., Φωκάς, Α., Μιγαδικές Μεταβλητές, Πανεπιστημιακές Εκδόσεις Κρήτης
- Καρακώστας, Γ., Εισαγωγή στη Μιγαδική Ανάλυση, Εκδόσεις Ευρυδίκη Κωσταράκη
- • Churchill, R., Brown, J., Μιγαδικές Συναρτήσεις και Εφαρμογές, Πανεπιστημιακές Εκδόσεις Κρήτης