COURSE OUTLINE

1. GENERAL

SCHOOL			
DEPARTMENT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	Y305-2023	**SEMESTER**	3rd Semester
COURSE TITLE	Mathematical Methods for Physics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	4	5.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://eclass.emt.duth.gr/courses/PHYSICS195/

2. LEARNING OUTCOMES

Learning Outcomes Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.
By the end of the course, students will know complex numbers and complex functions and their application to physics problems.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Search, analysis and synthesis of data and information, ICT Use	

3. COURSE CONTENT

Complex numbers: Definition. Algebraic properties. The geometric representation, modulus of a complex number, and the conjugate of a complex number. The triangular inequality. The polar form: argument and primary value of the argument of a complex number. The exponential form:. Powers and roots: de Moivre's formula.

Complex functions. Elementary functions. Exponential formula of Euler, logarithmic, trigonometric, and inverse.

Derivation of complex functions.
Integration of complex functions.

Power series of complex functions.

Applications

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	Use of ICT in Communication with students
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	52
Writing project	13
Bibliographic research & analysis	60
Total	**125**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation languages** Greek **Method (Formative or Concluding)** Summative **Student evaluation methods** **Rate**

5. Suggested Bibliography

Eudoxus

1. Βιβλίο [77108681]: ΜΑΘΗΜΑΤΙΚΕΣ ΜΕΘΟΔΟΙ ΓΙΑ ΦΥΣΙΚΟΥΣ: ΜΙΑ ΠΕΡΙΕΚΤΙΚΗ ΕΙΣΑΓΩΓΗ, TAI L. CHOW
2. Βιβλίο [133040877]: Μαθηματικές Μέθοδοι για Φυσικούς, George B. Arfken, Hans J. Weber, Frank E. Harris
3. Βιβλίο [143549983]: Διαφορικές Εξισώσεις, Μετασχηματισμοί και Μιγαδικές Συναρτήσεις, 2η Έκδοση, Μυλωνάς Νίκος, Σχοινάς Χρήστος