COURSE OUTLINE

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	3.001	**semester OF STUDIES**	3rd
COURSE TITLE	Differential Equations and Complex Analysis		

COURSEWORK BREAKDOWN	**TEACHING WEEKLY HOURS**	**ECTS Credits**
Theory	4	5
TOTAL	**4**	**5**

COURSE UNIT TYPE	General background
PREREQUISITES	
LANGUAGE OF INSTRUCTION/EXAMS	Greek
COURSE DELIVERED TO ERASMUS STUDENTS	
WEB PAGE (URL)	

(2) LEARNING OUTCOMES

Learning Outcomes

The course is one of the core Applied Mathematics courses taught in the Department, as the knowledge and the acquired skills are necessary for courses of the specialty of Electrical Engineering and in general in the background of engineering science. Thus, the intended educational results are:

1. Familiarity with basic special functions and their integral transformations used in applied scientific fields, as well as with forms, types and various mathematical techniques of partial differential equations that they meet in the bibliography.
2. Knowledge of the origin, mathematics properties and use of special functions and transformations in solving differential and integral equations and systems.
3. Knowledge of the main methodologies for solving partial differential equations, mainly linear and semi-linear, as well as related boundary value and initial value problems, met in Engineering and Physics.

With her successful completion of the course, the student will be in position:

- To know the general framework of mathematical manipulation of the relevant problems and to understand the form and practice use of solutions to the natural environment of each problem.
- To look for information about the theory and methodologies resolution, in appropriate bibliography source.
- To apply her appropriate technique for the solution of non-familiar problems.

General Skills

Search, analysis and composition of data and information. Adaptation in new situations.
Autonomous work. Work in an interdisciplinary environment. Production of new research ideas.

(3) SYLLABUS

Second-class Linear differential equations.

Systems of linear Differential Equations with constant coefficients (methods erasure, tables).

Complex Analysis (complex numbers and functions, complex differentiation and integration, Taylor and Laurent series, odd points, integral balance theorem and applications of).

Laplace Transformation.

Fourier Analysis (Series Fourier: Basics Meanings, Dirichlet theorem, Parseval type. Short Introduction in the Fourier integral.)

Boundary problems (Harmonics functions, Dirichlet Problems. Short Introduction at Partial Differential Equations. breaking up variables.)

(4) TEACHING METHODS-ASSESSMENT

MODE OF DELIVERY	Face with face in the class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Support Learning process via her electronics platform e-class
TEACHING ORGANIZATION	

Method description/Activity	**Semester Workload**
Choose	65
Exercises	30
Non guided study	55
Total Contact Hours	**150**

ASSESSMENT METHODS	1. Progress (40%) 2. Final examination (60%)

(5) RECOMMENDED BIBLIOGRAPHY

- *Barreira, Luis. Complex Analysis and differential equations. springer, 2012.*
- *Kreyszig, E., Stroud, K., & Stephenson, G. (2008). Advanced engineering mathematics. Integration, 9(4).*
- *Krantz, Steven G. Partial differential equations and complex analysis. CRC press, 2018.*