COURSE OUTLINE

(1) GENERAL

SCHOOL	Engineering		
DEPARTMENT	Electrical and Computer Engineering		
LEVEL OF STUDY	Undergraduate		
COURSE UNIT CODE	2.001	**SEMESTER**	2^{o}
COURSE TITLE	Calculus II		

COURSEWORK BREAKDOWN	**TEACHING WEEKLY HOURS**	**ECTS Credits**
Theory	5	6
TOTAL	**5**	**6**

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 basic Applied Analysis courses taught in the Department and focuses on the material of the calculus of multivariate functions.

It aims to give the student the knowledge of higher applied mathematics for engineers needed in his/her science in the areas of differential and integral calculus of multivariate functions, as well as vector analysis. This knowledge is necessary and used in the Mathematics courses of the curriculum that follow as well as in many subsequent courses of the Electrical Engineering specialty.

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

- To use efficiently the differential and comprehensive calculus of multivariate functions as well as the theory of vector analysis.
- To solve engineering problems that arise as applications of differential and comprehensive calculation of multivariate functions many variables, as well as vector analysis.

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

Multivariate functions. Limits, continuity, derivative in direction, partial derivative and applications. Total derivative-Tangent plane. Chain rule. First and superior class derivatives. Implicit

functions. Taylor Formula. Local extremes. Conditional Extremes. Double and triple integrals and applications. Changing variables. Elements of curve theory. Vector functions. Vector fields. The gradient, deviation, vorticity, and Laplace operators. Curved integrals and applications. Conservation fields. Graded and vector potential. Elements of the theory of surfaces. Surface integrals and applications. Green, Gauss and Stokes theorems. Applications to electromagnetism.

(4) TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	Face-to-face in class	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Support Learning process via her electronics platform e-class	
TEACHING ORGANIZATION	**Method description/Activity**	**Semester Workload**
	Lectures	60
	Self-contained Study	120
	Total Contact Hours	**180**
ASSESSMENT METHODS	Study and resolution exercises against the duration of semester (20%) and final examination (80%)	

(5) RECOMMENDED BIBLIOGRAPHY

- *Brand, Louis. Vector and tensor analysis. Courier Dover Publications, 2020.*
- *Thomas, G. B., Finney, R. L., Weir, M. D., & Giordano, F. R. (2003). Thomas' calculus. Reading: Addison-Wesley.*
- *Briggs, B. (2015). Multivariable Calculus. Pearson Education Incorporated.*
- *Marsden, J. E., & Tromba, A. (2003). Vector calculus. Macmillan.*