COURSE OUTLINE

(1) GENERAL

SCHOOL	UNIVERSITY OF THESSALY		
ACADEMIC UNIT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΓΚ0107	**SEMESTER**	1
COURSE TITLE	CALCULUS I		

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	4	5
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, specialized 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)	https://eclass.uth.gr/courses /CULT_U_125/

(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*
The course in the field of knowledge features advanced knowledge in a field of study that entail a critical understanding of theories. It requires advanced skills and provides the opportunity for solving complex problems in Differential Calculus of functions of one variable and Integral Calculus of simple integrals.

The course aims at Independent Work, exercising critical thinking and promoting free, creative and inductive thinking

(3) SYLLABUS

- Introduction to basic concepts of calculus. Sequences.

- Cauchy Sequences. Convergence of Sequences. Convergence Criteria.

- Numerical Series. Alternating sign series. Convergence Criteria.

- Introduction to real functions of a real variable.

- Types of functions: exponential, logarithmic, trigonometric, hyperbolic, inverse.

- Monotonicity of function extrema, Bolzano's Theorem.

- Limit-continuity of functions. Types of discontinuity.

- Derivatives and function study. The concept of differential.

- Rolle's theorem. Mean value theorem.

- Power series. Taylor-Maclaurin series.

- Indefinite integrals. Basic integration methods.

- Definite integrals. Integration techniques-applications.

- Generalized integrals. Existence criteria. Methods of integration.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in communicating with students

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,*	Activity	Semester workload
	Lectures - Study	150 hours

Course total		*150*

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.*	The Assessment procedure is written in Greek with Topics including the examination of theorems with proofs and definitions. In addition, Problems and Exercises are given for solution covering a large part of the course. The assessment criterion is the student's performance in the final written examination of the course.

(5) ATTACHED BIBLIOGRAPHY

-*Suggested bibliography:*

1. Georgiou D, Iliadis S., Megaritis A, Real Analysis, Tziolas Publ.
2. Kravvaritis D, Lessons in Analysis, Tsotras Publ.
3. Ntougias S., Infinitesimal Calculus I -II, Leader Books Publ
4. Panelidis G., Calculus I, Ziti Publ.
5. Rassias Th., Mathematics I, Tsotras Publ.
6. Tsitsas L., Apllied Infinitesimal Calculus, Symmetria Publ.
7. Spivak M., Differential and Integral Calculus, P.E.K.
8. Thomas, Finney R, Weir M., Giordano F., Infinitesimal Calculus, P.E.K.