ECTS

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM IN THE EUROPEAN UNION

(B) Course information in english

General course information:

Course title:	Infinitesimal Calculus I	**Course code:**	
Credits:	5	**Work load (hours):**	

Course level:	Undergraduate ☒	Graduate	☐
Course type:	Mandatory ☒	Selective	☐
Course category:	Basic ☒	Orientation	☐
Semester:	1st	**Hours per week:**	4

Course objectives (capabilities pursued and learning results):

The course contains the whole concept of Infinitesimal Calculus including Differential and Integral Calculus of one variable which constitutes the Calculus of one variable functions.
The aim of the course is to create the proper mathematical background so that the student come to be able to establish critical thought and to acquire the properly tools for solving mathematical problems on Engineering Science.

Prerequisites: Lyceum Mathematics (Algebra and Analysis)

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Instructor's data:

Name:	Dr. Athanasios Fragkou
Level:	E.DI.P.
Office:	Civil Engineering Faculty University of Thessaly Pedion Areos, 38334 Volos, Greece
Tel. – email:	Tel: +30 2421074363 email: fthanos@uth.gr
Other tutors:	-

Specific course information:

Week No.	Course contents	Hours	
		Course attendance	Preparation
1	Introduction to basics in Calculus. Sequences.	**4**	**3**
2	Cauchy Sequences. Convergence of Sequences. Convergence Criteria.	**4**	**3**
3	Numerical Series. Series with alternative sign. Convergence Criteria	**4**	**3**
4	Introduction to real functions of one real variable.	**4**	**3**
5	Function Categories: Exponential, Logarithmic, Trigonometric, Hyperbolic, Inverse trigonometric.	**4**	**3**
6	Function Monotony – Extremums, Bolzano Theorem.	**4**	**3**
7	Function Limits - Continuity. Kinds of discontinuity.	**4**	**3**
8	Derivatives and function “Study”. The meaning of differential.	**4**	**3**
9	Rolle’s Theorem. Mean Value Theorem.	**4**	**3**
10	Dynamical Series. Taylor – Maclaurin Series	**4**	**3**
11	Integrals - antiderivation. Basic Methods of integration.	**4**	**3**
12	Definite Integrals. Integration Techniques - Applications	**4**	**3**
13	Improper Integrals. Excising Criteria	**4**	**3**
14	Improper Integrals. Integration Methods.	**4**	**3**

Additional hours for:			
Class project	**Examinations**	**Preparation for examinations**	**Educational visit**
	3	20	-

Suggested literature:
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.

Teaching method *(select and describe if necessary* - **weight***):*		
Teaching	☒	100%
Seminars	☐	-
Demonstrations	☐	-
Laboratory	☐	-
Exercises	☐	-
Visits at facilities	☐	-
Other *describe):*…….	☐	-
Total		100%

Evaluation method *(select)*- **weight:**				
	written	*%*	*Oral*	*%*
Homework	☐		☐	
Class project	☐		☒	
Interim examination	☐		☐	
Final examinations	☒	100	☐	
Other *(describe):* ……	☐		☐	