Course name: Mathematics I - One variable analysis

ECTS	6.0
Course status	*facultative*
Course final assessment /evaluation of outcomes	*Exam*
Prerequisite	*basic knowledge in mathematical analysis (high school knowlegde)*

Main field of study: **Environmental Engineering**

Educational profile	*General academic*
Code of studies and education level	*bachelor*
Semester of studies	*winter*
Language of instruction	*English*

Course offered by:

Name of faculty offering the course	Environmental Engineering and Land Surveying
Name of department offering the course	Applied Mathematics
Course coordinator	Prof. Marek Ptak Ph. D. and Kamila Kliś-Garlicka, Ph. D.

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands			
MAI-K1	mathematics issues including analysis of function of one variable necessary to describe technical and natural phenomena occurring in the environment	IS1_W01	T
SKILLS – student is able to			
MAI-S1	apply standard mathematical methods to solve environmental engineering problems and critically evaluate the results of numerical analysis	IS1_U01	T
SOCIAL COMPETENCIES – student is ready to:			
MAI-C1	carry on continuous training and raising professional, personal and social competences as well as demonstrating an active attitude towards environmental protection problems and shaping its resources	IS1_K01	T

Teaching contents

Lectures:	15 hours
Topics	1. Convergence of sequences 2. Definition and convergence of series and power series 3. Complex numbers 4. Relations, functions as a relations

	5. Function properties 6. Limits and continuity of functions 7. Derivatives 8. Lagrange's theorem, Taylor's theorem 9. De L'Hospital theorem 10. Applications of derivatives. Extreme values of functions 11. Concavity and convexity of functions 12. Integral

Accomplished learning outcomes	*MAI-K1, MAI-C1*
Means of verification, rules and criteria of assessment	*Single-choice test, positive assessment should be given at least 50% of correct answers to given questions: <50% - insufficient (2.0); 50-60% - sufficient (3.0); 61-70% - satisfactory plus (3,5); 71-80% - good (4.0); 81-90% - good plus (4,5); 91-100% - very good (5.0). The share of the lecture grade in the final grade is 50%.*

Classes:	30 hours
Topics	1. Convergence of sequences 2. Definition and convergence of series and power series 3. Complex numbers 4. Relations, functions as a relations 5. Function properties 6. Limits and continuity of functions 7. Derivatives 8. Lagrange's theorem, Taylor's theorem 9. De L'Hospital theorem 10. Applications of derivatives. Extreme values of functions 11. Concavity and convexity of functions 12. Integral

Accomplished learning outcomes	*MAI-S1,* MAI-C1
Means of verification, rules and criteria of assessment	*Passing reports on exercises - a grade from exercises is an arithmetic average of formative grades. The share of the grade for the project exercises in the final grade of the subject is 50%.*

References:

Basic	Paul Dawkins "Calculus 1", https://notendur.hi.is/adl2/CalcI_Complete.pdf
Supplementary	EDWIN "JED"HERMAN,GILBERT STRANG, Calculus vol. 1, https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/calculus-volume-1-5.2-previous.pdf

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	...	ECTS **
Area of academic study: T – technical sciences	6.0	ECTS**

Structure of student activity

Contact hours		57	hrs.	2.3 ECTS**
Including:	lectures	15	hrs.	
	classes and seminars	30	hrs.	

	consultations	10	hrs.		
	participation in research	…	hrs.		
	obligatory traineeships	…	hrs.		
	participation in examination	2	hrs.		
e-learning		…	hrs.	….	ECTS**
student own work		93	hrs.	3.7	ECTS**

*Areas of academic study in the fields of: A – the arts; H- humanities; M- medical, sport and health sciences; N – natural sciences; P – biological sciences; R – Agricultural, forestry and veterinary sciences; S - social studies; T – engineering and technology;

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes