

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Mathematics</b>		Code <b>1010701311010340001</b>
Field of study <b>Environmental Protection Technologies</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 1</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>30</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>basic</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>the sciences</b>		ECTS distribution (number and %) <b>5 100%</b>
<b>Responsible for subject / lecturer:</b> Dr Alina Gleska email: alina.gleska@put.poznan.pl tel. 61 665 2330 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr Marian Dondajewski email: marian.dondajewski@put.poznan.pl tel. 61 665 2805 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of elementary functions, algebraic operations, analytical geometry, trigonometry and mathematical analysis.
2	<b>Skills</b>	Students should be able to solve simple rational equations and inequalities, to give domains of elementary functions and to know their curves.
3	<b>Social competencies</b>	Students seriously treat the process of studying.
<b>Assumptions and objectives of the course:</b> Differential and integral calculus of one variable are presented together with their applications in mathematics and physics.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Students have the knowledge about differential and integral calculus - [K_W01]		
<b>Skills:</b>		
1. Students know first derivatives of functions and their geometric interpretations. - [K_U01]		
2. Students can calculate the integrals of elementary functions and use them in important applications. - [K_U01]		
<b>Social competencies:</b>		
1. Students understand the importance of effective using of mathematics in other areas of science. - [K_K01]		
<b>Assessment methods of study outcomes</b>		
Lecture: written exam (both theoretical and practical parts)		
Tutorials: two colloquia (during the 7th and 14th weeks)		
<b>Course description</b>		

Applied methods of teaching: lectures on the blackboard; tutorials ? solving problems on the blackboard and discussing solutions.

The elements of mathematical logics. The concept of limits of real numbers sequences. The investigation of monotonicity and boundedness of sequences, the setting of their limits. Euler constant. The concept of functions: domains, qualitative properties, the review of elementary functions, the concept of limits and continuity of functions. The differential calculus of functions of one variable: the derivative and its applications, the intermediate value theorems for derivatives, the L'Hospital's rule. The integral calculus: the Riemann integral of a bounded function on a finite interval [a,b] and its applications. Improper integrals.

UPDATE: 2016/2017

**Basic bibliography:**

1. W. Żakowski, Matematyka, T.1 i T.2, WNT, Warszawa 2003.
2. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 ( Definicje, twierdzenia, wzory), GiS, Wrocław 2011.
3. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 ( Przykłady i zadania), GiS, Wrocław 2011.
4. S. Gnińska, K. Nowakowski, D. Stachowiak-Gnińska, Zbiór zadań z matematyki dla chemików, Wydawnictwo Naukowe UAM, Poznań 2003.

**Additional bibliography:**

1. W. Krywicki, L. Włodarski, Analiza matematyczna w zadaniach, T.1, T.2, PWN, Warszawa 2011.

**Result of average student's workload**

Activity	Time (working hours)	
1. Lectures (15x2h)	30	
2. Tutorials (15x2h)	30	
3. Homeworks	15	
4. Preparing for tests	15	
5. Preparing for the exam	15	
6. Meetings with the lecturer	6	
7. Exam	4	
Student's workload		
Source of workload	hours	ECTS
Total workload	115	5
Contact hours	70	3
Practical activities	45	2