STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Mathematics		
Field of study	Profile of study (general academic, practical)	Year /Semester
Chemical and Process Engineering	**general academic**	**1/1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
	polish	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **2** Classes: **2** Laboratory: **-** Project/seminars: **-**		**5**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
basic	**from field**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge of mathematics defined by the core curriculum of mathematics education at the advanced level of secondary school.
2	**Skills**	The ability to associate facts, information processing, reasoning, interpretation and ability to reflect.
3	**Social competencies**	Understands the need to supplement education and increasing personal and professional competences.

Assumptions and objectives of the course:

1. Familiarize students with the methods of mathematical analysis and education skills to apply them to the analysis of the phenomena and problems in the field of engineering.
2. Developing skills related to finding information not directly expressed, finding connections between distributed information, inference on the basis of several factors.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student knows the formulas, graphs and properties of elementary functions. - [K_W01]
2. The student knows the concept of derivative of a function, geometric meaning of derivative of at the point, rules for finding derivative. - [K_W01]
3. The student knows the concept of indefinite integrals of functions, basic methods of integration of functions and geometric meaning of the definite integral function in the interval. - [K_W01]

Skills:

1. The student analyzes the properties of the function using the concepts and methods provided by the calculus.
2. The student uses calculus in the calculations resulting from the needs of engineering practice.
3. The student builds a simple mathematical models of phenomena and physical processes.
4. The student simulates, using carefully selected instruments calculus, the course of those processes taking into account the extreme behavior.

Social competencies:

1. The student understands the need to supplement education and increasing professional competences. - [K_K01]
2. The student can act and cooperate in the group accepting different roles. - [K_K03]

Assessment methods of study outcomes

Lecture: Exam at the end of the semester:
- Sat. 1 knowledge test (4 questions)
- Sat. 2 test of skills (4 jobs).

Method of evaluation: each answer/solution evaluated point system with a scale of 0-3 points.
Duration of test: 60 minutes.
Tutorials:
- 2 colloquia written during the semester (7 and 14 weeks),
- permanent evaluation for each course.

Course description

1. Elements of logic. Elements of set theory, the set of real numbers. The scalar function.
2. Elementary functions (formulas, graphs, properties).
3. The limit of a function and applications.
4. Differential calculus of one variable function with selected applications in engineering practice. Taylor and Maclaurin series.
5. Integral calculus of one variable function with selected applications in engineering practice.

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), Oficyna Wydawnicza GiS, Wrocław 2011.
3. W. Krysicki, L. Włodarski, Analiza matematyczna w zadaniach, T.1, T.2, PWN, Warszawa 2011.

Additional bibliography:

1. W. Stankiewicz, J. Wojtowicz, Zadania z matematyki dla wyższych uczelni technicznych, T.1, T.2, PWN, Warszawa 2003.
2. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka dla studentów uczelni technicznych, t. I, II i III, Wydawnictwo Politechniki Poznańskiej, Poznań 2004.

Result of average student's workload

Activity	Time (working hours)
1. lecture	**30**
2. preparation for tutorials	**20**
3. tutorials	**30**
4. credit preparation	**16**
5. credit	**4**

Student's workload

Source of workload	hours	ECTS
Total workload	100	5
Contact hours	60	3
Practical activities	0	0