STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Mathematics I		**1010331211010342117**

Field of study	Profile of study (general academic, practical)	Year /Semester
Automatic Control and Robotics	**(brak)**	**1 / 1**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
-	**English**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **60**	Classes: **30**	Laboratory: **-**	Project/seminars: **-**	**8**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**8 100%**
Technical sciences	**8 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge with range of secondary school.[PRK 4]
2	**Skills**	Student is able to meet the challenges arising from the high school.[PRK 4]
3	**Social competencies**	Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills. [K1_K01 (P6S_KK), K1_K03 (P6S_KR)]

Assumptions and objectives of the course:

The recognizing methods and applications of differential and integral calculus of functions of single variable. The getting to know applications of double integral.

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

Knowledge:

1. To understand the concept of limit of the sequence, divergence of the series, derivative and it applications - [K1_W01 (P6S_WG)]
2. To mean the idea of partial derivatives, to be able calculate extrema for functions of two variables - [K1_W01 (P6S_WG)]
3. To comprehend the concept of double integral and know methods of calculation and applications - [K1_W01 (P6S_WG)]

Skills:

1. To calculate the derivative. Find monotonicity, maxima, minima of functions of single variable - [K1_U01 (P6S_UU)]
2. To calculate indefinite and definite integrals, measures of areas, the length of curves, volumes and surface areas of solids of revolution. - [K1_U01 (P6S_UU)]
3. To calculate partial derivatives, extrema for functions of two variables, to calculate divergence and curl of vector field - [K1_U01 (P6S_UU)]
4. To calculate double integral - [K1_U01 (P6S_UU)]

Social competencies:

Assessment methods of study outcomes

Lectures: written exam checking theoretic knowledge and ability it application in practical exercises.
Classes: tests during the semester and colloquium

Course description

Differential and integral calculus of functions of single variable. Applications of integrals. Differential calculus of functions of several variables. Double integral and its applications. Infinite series and power series. Fourier transform.

Update 1.10.2018.
Applied methods of education:

I Lectures
1. Interactive lecture with questions to the group of students
2. Discussions

II Classes
1. Solving illustrative tasks on board
2. Teacher?s detailed assessment of students? solutions followed by discussion and comments

Basic bibliography:

1. G. Decewicz, W. Żakowski, Matematyka, t. I, WNT, Warszawa, 2009.
2. W. Żakowski, M. Kołodziej, Matematyka, t. II, WNT, Warszawa, 2013.
3. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka, cz. I, II, III, Wyd. Politechniki Poznańskiej, Poznań, 2001.
4. F. Leja, Rachunek różniczkowy i całkowy, PWN, Warszawa, 2008.

Additional bibliography:

1. Krysicki W., Włodarski L.: Analiza matematyczna w zadaniach. Część I, II, PWN, Warszawa, 2013.
2. Stankiewicz W.: Zadania z matematyki dla wyższych uczelni technicznych. Część I, II, PWN, Warszawa, 2012.
3. M. Gewert, Z. Skoczylas, Analiza matematyczna 1 i 2, Oficyna Wyd. GiS, Wrocław, 2012.
4. B. Sikora, E. Łobos, A first course in calculus, Wydawnictwo Politechniki Śląskiej, 2007.
5. B. Sikora, E. Łobos, Advanced calculus : selected topics, Wydawnictwo Politechniki Śląskiej, 2009.

Result of average student's workload

Activity	Time (working hours)
1. Lectures	60
2. Classes	30
3. Consultations and exam	7
4. Preparation for classes	60
5. Preparation for exam	33

Student’s workload

Source of workload	hours	ECTS
Total workload	190	8
Contact hours	97	4
Practical activities	93	4