

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Selected topics in mathematics I</b>		Code <b>1010331121010348984</b>
Field of study <b>Automatic Control and Robotics</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 2</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>English</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>15</b> Classes: <b>15</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</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>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr Wiesława Nowakowska email: wieslawa.nowakowska@put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of differentiation and integration.
2	<b>Skills</b>	Solving problems
3	<b>Social competencies</b>	Student understands the need and knows the possibility of studying (postgraduate courses, second-degree studies), improving language skills, professional, personal and social skills.
<b>Assumptions and objectives of the course:</b> The recognizing methods of solving of differential equations and applications of differential equations.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. To know types of differential equations and methods of their solving - [K_W01+++] 2. To understand the concept of The Laplace transform and know it properties and methods of calculation - [K_W01+++]		
<b>Skills:</b> 1. To recognize type of differential equation and solve it - [K_U02+ K_U05+] 2. Apply The Laplace transform to solve linear differential equations and systems of linear differential equations with constant coefficients - [K_U02+ K_U05+]		
<b>Social competencies:</b>		
<b>Assessment methods of study outcomes</b>		
Lectures: written test checking knowledge and ability its application Classes: tests during the semester and the direct activity during the classes		
<b>Course description</b>		

First order differential equations. Differential equations of higher order-reduction of order. Linear differential equations of higher order. Systems of linear differential equations with constant coefficients The Laplace transform and it application to differential equations.

Update 2017.

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. W. Żakowski, W. Leksiński, Matematyka, t. IV, WNT, Warszawa, 1998.
2. J. Morchał, Z. Ratajczak, J. Werbowski, Równania różniczkowe w zastosowaniach, Wyd. Politechniki Poznańskiej, Poznań, 2002.
3. W. W. Stiepanow, Równania różniczkowe, PWN, Warszawa, 1964.
4. I. Folyńska, Z. Ratajczak, Z. Szafranski, Matematyka, cz. III, Wyd. Politechniki Poznańskiej, Poznań, 2001.

**Additional bibliography:**

1. M. Gewert, Z. Skoczylas, Równania różniczkowe zwyczajne, Oficyna Wyd. GiS, Wrocław, 2011.
2. W. Krywicki, L. Włodarski, Analiza matematyczna w zadaniach, Część II, PWN, Warszawa, 2012.
3. W. Stankiewicz, Zadania z matematyki dla wyższych uczelni technicznych. Część II, PWN, Warszawa, 2012.
4. B. Sikora, E. Łobos, Advanced calculus : selected topics, Wydawnictwo Politechniki Śląskiej, 2009.

**Result of average student's workload**

Activity	Time (working hours)
1. Lectures	15
2. Classes	15
3. Exam/passing lectures consultations	5
4. Preparation for classes	15
5. Preparation for exam/ passing lectures	15

**Student's workload**

Source of workload	hours	ECTS
Total workload	65	2
Contact hours	35	1
Practical activities	30	1