

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Selected topics in mathematics I		Code 1010331121010345153
Field of study Automatic Control and Robotics	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: 15 Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr Wiesława Nowakowska email: wieslawa.nowakowska@put.poznan.pl tel. 616652320 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of differentiation and integration [K1_W01 (P6S_WG)]
2	Skills	Solving problems [K1_U01 (P6S_UW)]
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)]
Assumptions and objectives of the course: The recognizing methods of solving of differential equations and applications of differential equations.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. To know types of differential equations and methods of their solving - [K1_W01 (P6S_WG)] 2. To understand the concept of The Laplace transform and know it properties and methods of calculation - [K1_W01 (P6S_WG)]		
Skills:		
1. To recognize type of differential equation and solve it - [K1_U02 (P6S_UO)] 2. Apply The Laplace transform to solve linear differential equations and systems of linear differential equations with constant coefficients - [K1_U02 (P6S_UO)]		
Social competencies:		
Assessment methods of study outcomes		
Lectures: written test checking knowledge and ability of its application Classes: tests during the semester and the direct activity during the classes		
Course description		

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 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. W. Żakowski, W. Leksiński, *Matematyka, cz. 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.
5. D. Bobrowski, Z. Ratajczak, *Przekształcenie Laplace'a i jego zastosowania*, Wydawnictwo Politechniki Poznańskiej, 1994.

Additional bibliography:

1. M. Gewert, Z. Skoczylas, *Równania różniczkowe zwyczajne*, Oficyna Wyd. GiS, Wrocław, 2011.
2. W. Kryszewski, 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.

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