

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Selected branches of mathematics II</b>		Code <b>1010331221010345154</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>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>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 inż. Zenon Zbąszyniak email: zenon.zbaszyniak@put.poznan.pl tel. 616652330 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>	The student has a knowledge of mathematics (range: linear algebra, differential and integral calculus, initial value problems for ordinary differential equations).
2	<b>Skills</b>	The student is able to solve math problems analytically within the range specified above.
3	<b>Social competencies</b>	The student is aware of the need to expand their competences. He understands the need for learning.
<b>Assumptions and objectives of the course:</b> Learning of numerical methods and discrete mathematics and apply them to solve simple engineering problems.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. The student has basic knowledge of numerical methods and discrete mathematics for solving simple engineering tasks - [K_W02+++]		
2. The student has a structured and theoretically supported knowledge in basic algorithms, technics of construction of algorithms, abstract structures of data and their implementation. - [K_W02+++]		
<b>Skills:</b>		
1. The student is able work individually and in a group. He is able to estimate the time that is necessary for realisation of deputed problem. - [K_U04+++]		
2. The student is aware of the necessity of self-education in order to improve professional skills. - [K_U05+++]		
3. The student is able to use information from references, data bases and other sources. - [K_U01+++]		
<b>Social competencies:</b>		
1. The student knows the limitations of their knowledge and understands the need for further education. - [K_K01+++]		
2. It is aware of the validity of the effects of engineering calculations. - [K_K02+++]		
<b>Assessment methods of study outcomes</b>		

<p>Lecture  Valuation of knowledge and skills during written test.</p> <p>Practical Lessons  Test concerning an application of knowledge from the lectures in exercises (student can use his own notes)  Systematic control of theoretical knowledge in form of short quizzes.  Valuation of student answers during lessons.  Valuation of activity during lessons.</p>		
<b>Course description</b>		
<p>Revision 2017</p> <p>Applied methods of education: lectures and practical lessons.</p> <p>Lecture with multimedia presentation (including: drawings, photos) supplemented by examples given on the board. Interactive lectures with problems and questions for students. The activity of students is taken into account in valuation of them. Discussion during lectures is expected.  Connections with others mathematical subjects are indicated.</p> <p>Practical lessons. Solving of exemplary exercises on a blackboard. Discussion of solutions with relative comments.</p> <p>Relations, sequences and functions in turn of discrete mathematics. Mathematical induction principle. Recurrence definitions and recurrence relations. Floating point arithmetic, numerical errors. Stability and accuracy of algorithms. Solutions of nonlinear equations in one variable. Interpolation. Numerical integration. The Selected issues for linear systems of equations. Numerical solutions of ordinary differential equations.</p>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>1. K.A. Ross, C.R.B. Wright, Matematyka dyskretna, PWN, Warszawa 2003.</li> <li>2. Fortuna, Macukow, Wąsowski, Metody numeryczne, WNT, liczne wydania</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>1. R. L. Graham, D. E. Knuth, O. Patashnik, Matematyka konkretna, PWN, Warszawa 2002.</li> <li>2. Kincaid, Cheney, Analiza numeryczna, WNT, Warszawa 2005,</li> </ol>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Participation in lectures	15	
2. Participation in practical lessons	15	
3. Preparing for practical lessons	15	
4. Preparing for test	10	
5. Preparing for test (lectures)	10	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	65	2
Contact hours	15	0
Practical activities	15	0