

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Numerical methods		Code 1010341751010340026
Field of study Mathematics in technology	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 5
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: 30 Classes: 15 Laboratory: 45 Project/seminars: -		No. of credits 6
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 %) 6 100% 6 100%
Responsible for subject / lecturer: Barbara Szyszka email: Barbara.Szyszka@put.poznan.pl tel. 61 665 27 63 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The student has a knowledge of mathematics (range: linear algebra, differential and integral calculus, initial value problems for ordinary differential equations), and computer science (for programming in high level language)
2	Skills	The student is able to solve math problems analytically within the range specified above. The student is able to implement a computer program.
3	Social competencies	He understands the need for learning.
Assumptions and objectives of the course: Learning of basic numerical methods and apply them to solve mathematical and simple engineering problems. The support of mathematical and engineering calculations by relevant IT tools.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. The student has basic knowledge about numerical methods allow to solve mathematical and simple engineering problems, he knows the tools used to perform numeric calculations - [K_W09]		
2. The student has well-ordered knowledge of computer-aided calculation. - [K_W12]		
3. The student knows at least one computer package supporting numerical calculations - [K_W15]		
Skills:		
1. The student is able to choose adequate numerical methods used to solve mathematical problems - [K_U08]		
2. The student knows at least one computer package supporting numerical calculations - [K_U20]		
3. The student can perform measurements and computer tests, interpret the results and draw conclusions. - [K_U26]		
4. The student applies the principles of occupational health and safety. - [K_U27]		
Social competencies:		
1. The student knows the limitations of their knowledge and understands the need for further education - [K_K01]		
2. The student is aware of the validity of the effects of engineering calculations, and responsibility for decisions. - [K_K04]		
3. The student can independently search for information in the literature, also in English. - [K_K05]		

Assessment methods of study outcomes		
<p>Lecture</p> <ul style="list-style-type: none"> * Assess the knowledge and skills of the written examination, * Control of perception during lectures. <p>exercises:</p> <ul style="list-style-type: none"> * Assess the knowledge and skills demonstrated during two written tests. <p>Laboratory exercises:</p> <ul style="list-style-type: none"> * Tests and rewarding knowledge necessary for the accomplishment of the problems in the area of laboratory tasks, * Continuous assessment, for each lesson - rewarding the skills of the use methods, <p>Obtaining additional points for the activity in the classroom, and in particular for:</p> <ul style="list-style-type: none"> * Propose to discuss additional aspects of the subject; * The effectiveness of the application of acquired knowledge when solving a given problem; * Comments relating to the improvement of teaching materials; 		
Course description		
<ol style="list-style-type: none"> 1. Floating point arithmetic, numerical errors, 2. Stability and accuracy of algorithms. 3. Solutions of nonlinear equations in one variable 4. The approximation of functions (Interpolation, Taylor series) 5. Numerical integration. 6. Numerical differentiation. 7. Initial-value problems for ordinary differential equations 		
Basic bibliography:		
<ol style="list-style-type: none"> 1. Fortuna, Macukow, Wąsowski, Metody numeryczne, WNT, 2. Kincaid, Cheney, Analiza numeryczna, WNT 2005, 3. Magnucka-Blandzi, Dondajewski, Gleska, Szyszka, Metody numeryczne w MatLabie. Wybrane zagadnienia, Wyd. Politechniki Poznańskiej 2013, 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Burden, Faires, Numerical analysis, Prindle, Weber&#38;Schmidt, Boston, 2. Rosłonec, Wybrane metody numeryczne z przykładami zastosowań w zadaniach inżynierskich, Oficyna Wydawnicza politechniki Warszawskiej 2008, 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	30	
2. Participation in classes	15	
3. Participation in laboratory classes	45	
4. Participation in consultations	4	
5. implementation and verification the programs (time outside of the classroom laboratory)	5	
6. preparation for classes/ laboratory	12	
7. preparation for tests	12	
8. familiarization with the indicated literature and teaching materials	15	
9. preparation for exam and participation in the exam	13	
Student's workload		
Source of workload	hours	ECTS
Total workload	151	6
Contact hours	96	4
Practical activities	58	2