

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Symbolic computation</b>		Code <b>1010341751010348918</b>
Field of study <b>Mathematics in technology</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</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: - Classes: - Laboratory: <b>15</b> Project/seminars: -		No. of credits <b>1</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b>  dr Piotr Rejmenciak email: piotr.rejmenciak@put.poznan.pl tel. 61 6652359 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 mathematics.
2	<b>Skills</b>	Basic skills of programming.
3	<b>Social competencies</b>	Students should know the boundedness of their knowledge and understand the need of further education.
<b>Assumptions and objectives of the course:</b> Understanding differences between symbolic methods of computing and numerical ones. Getting knowledge of Maxima - Computer Algebra System.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. A student understand limitation of symbolic methods of computing - [K_W08]		
2. A student understand connections between mathematical theorems and symbolic computations - [K_W07, K_W06]		
3. A student know how to use Maxima to prove chosen theorems - [K_W09]		
<b>Skills:</b>		
1. A student can choose a better method of symbolic and numerical methods for chosen problem - [K_U25]		
2. A student can write problem in Maxima - language - [K_U26]		
3. A student can verify a program written in Maxima - [K_U27]		
<b>Social competencies:</b>		
1. A student is able to formulate a problem precisely and try to solve it. - [K_K04]		
<b>Assessment methods of study outcomes</b>		

Laboratory: problem for homework (15 p.) test (15 punktów) 3,0 from 16 p., 3,5 from 19 p., 4,0 from 22 p., 4,5 from 25 p., 5,0 from 28 p.		
<b>Course description</b>		
Introduction to MAXIMA: menu, help, loops, conditions. Linear algebra: matrices. Equations. Analysis: limits, derivatives, integrals. Series, products. Algebra: GCD, LCM, division, number theory. Programming in Maxima, LaTeX.		
<b>Basic bibliography:</b>		
1. Maxima manual, <a href="http://michel.gosse.free.fr/documentation/fichiers/maxima.pdf">http://michel.gosse.free.fr/documentation/fichiers/maxima.pdf</a> 2. Paulo Ney de Souza, Richard J. Fateman, Joel Moses, Cliff Yapp, The Maxima Book, <a href="http://maxima.sourceforge.net/docs/maximabook/maximabook-19-Sept-2004.pdf">http://maxima.sourceforge.net/docs/maximabook/maximabook-19-Sept-2004.pdf</a> 3. R. Filipów, J. Gulgowski, Zastosowanie pakietu Maxima w Analizie Matematycznej, Uniwersytet Gdański, Gdańsk 2010.		
<b>Additional bibliography:</b>		
1. W. Młoczek, Matematyka wyższa z Maximą, Akademia Rolnicza w Krakowie, Kraków 2006. 2. C. T. Lachowicz, Matlab, Scilab, Maxima. Opis i przykłady zastosowań, Wydawnictwo Politechniki Opolskiej, Opole 2005.		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	30	1
Contact hours	15	1
Practical activities	15	1