

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Symbolic computation		Code 1010342611010348918
Field of study Mathematics	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: - Classes: - Laboratory: 15 Project/seminars: -		No. of credits 1
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		ECTS distribution (number and %)
Responsible for subject / lecturer: dr Piotr Rejmenciak email: piotr.rejmenciak@put.poznan.pl tel. 61 6652359 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of mathematics.
2	Skills	Basic skills of programming.
3	Social competencies	Students should know the boundedness of their knowledge and understand the need of further education.
Assumptions and objectives of the course: Understanding differences between symbolic methods of computing and numerical ones. Getting knowledge of Maxima - Computer Algebra System.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
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 choosen theorems - [K_W09]		
Skills:		
1. A student can choose a better method of symbolic and numerical methods for choosen 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]		
Social competencies:		
1. A student is able to formulate a problem precisely and try to solve it. - [K_K04]		
Assessment methods of study outcomes		

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.		
Course description		
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.		
Basic bibliography: 1. Maxima manual, http://michel.gosse.free.fr/documentation/fichiers/maxima.pdf 2. Paulo Ney de Souza, Richard J. Fateman, Joel Moses, Cliff Yapp, The Maxima Book, http://maxima.sourceforge.net/docs/maximabook/maximabook-19-Sept-2004.pdf 3. R. Filipów, J. Gulgowski, Zastosowanie pakietu Maxima w Analizie Matematycznej, Uniwersytet Gdański, Gdańsk 2010.		
Additional bibliography: 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.		
Result of average student's workload		
Activity		Time (working hours)
Student's workload		
Source of workload	hours	ECTS
Total workload	30	1
Contact hours	15	1
Practical activities	15	1