



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Math software [S1MNT1>OM]

### Course

Field of study

Mathematics of Modern Technologies

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

0

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

4,00

### Coordinators

dr Piotr Rejmenciak

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### Lecturers

### Prerequisites

The student has a basic knowledge of mathematics

### Course objective

Showing the differences between the calculation methods: (approximate) numerical and symbolic. Getting to know the basic capabilities of the Maxima, the Python library - SymPy. Bring the GeoGebra program closer as a geometric 'calculator'. Showing how to use the above programs to automate writing texts in LaTeX

### Course-related learning outcomes

Knowledge:

• He knows the limitations of symbolic computational methods. Knows how to create a function graph in GeoGebra [K\_W01(P6S\_WG), K\_W05(P6S\_WG), K\_W07(P6S\_WG), K\_W10(P6S\_WG)].

Skills:

• He can use a symbolic package for calculations. He can use the GeoGebra program. Can write a mathematical text using the above programs [K\_U01(P6S\_UW), K\_U02(P6S\_UW), K\_U03(P6S\_UW),

K\_U04(P6S\_UW), K\_U05(P6S\_UW), K\_U07(P6S\_UW), K\_U08(P6S\_UW), K\_U14(P6S\_UK)].

Social competences:

- He is responsible and is aware of the need for reliability at work. Can edit the correct text in Polish [K\_K01(P6S\_KK)].

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratory classes: projects and final test - pass mark: 50% of points;

Projects/seminars: projekt.

### Programme content

Laboratory classes:

getting to know the software:

- Maxima, SymPy
- GeoGebra
- LATEX

### Course topics

Laboratory classes:

- Maxima, SymPy: solving systems of equations, integration, differentiation;
- GeoGebra: function graphs, geometric graphs;
- LATEX: Marcin Woliński's class and LATEXpolonization.

### Teaching methods

Laboratory classes: laboratories;

Projects/seminars: presentations.

### Bibliography

Basic:

- Maxima manual;
- GeoGebra;
- LaTeX - <http://mirrors.ctan.org/info/lshort/polish/lshort-pl.pdf>;
- 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>;
- R.Filipów, J.Gulgowski, Zastosowanie pakietu Maxima w Analizie Matematycznej, Uniwersytet Gdański, Gdańsk 2010.

Additional:

- W.Młoczek, Matematyka wyższa z Maximą, Akademia Rolnicza w Krakowie, Kraków 2006;
- C. T. Lachowicz, Matlab, Scilab, Maxima. Opis i przykłady zastosowań, Wydawnictwo Politechniki Opolskiej, Opole 2005.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00