



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Information technology - basic course [S1TOZ1>Tlpp]

### Course

Field of study

Circular System 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

elective

### Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

30

### Number of credit points

3,00

### Coordinators

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### Lecturers

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### Prerequisites

Fundamental knowledge related to computers and their importance for human society.

### Course objective

To familiarize students with the specifics of computers. To indicate the width of areas of use of digital machines in the scientific, design and engineering environment, as well as in the area of functioning of society. Special sensitisation of students to a number of non-intuitive phenomena occurring during design, numerical or simulation calculations. The subject is profiled from a technical point of view, with particular emphasis on the application of digital tools in the field of chemical technology and engineering.

### Course-related learning outcomes

Knowledge:

the effect of teaching this subject is the knowledge of the advantages and limitations of using computer-aided techniques. special emphasis is placed on the knowledge of the realities of computer-

aided design and the characteristics of conducting simulation calculations (k\_w01).

Skills:

ability to use mathcad mathematical software (k\_u02).

Social competences:

the student is aware of the importance of digital devices for human society. particular emphasis is placed on the impact of digital machines on the quality and efficiency of design and analytical tasks, with particular emphasis on the chemical technology environment (k\_k02).

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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The lecture: Examination of the content presented in the lecture.

Project: Ongoing check of the degree of mastery of the material on colloquia.

### Programme content

Basic learning how to enter and edit formulas, getting used to the specifics of Mathcad's operation - for example, to perform calculations "live". Mathematical operators: differential, integral, sum, etc. Symbolic calculations. Importing data from a text or excel file. Saving data to file. Graphs of data and 2D functions, and also 3D. Calculations with matrices and vectors. Units, conversion to different systems e.g. SI to CGS etc. Simple statistics e.g. average, median, standard deviation, etc. Linear (slope, intercept) and non-linear (genfit) regression. Solving equations and systems - given find. Solving ordinary differential equations and systems - given odesolve. Solving of partial differential equations and systems - given pdesolve.

### Teaching methods

Presentation of the functioning of applied tools, current exercises performed by students in computer laboratories.

### Bibliography

Basic

Mathcad 12, 11, 2001i, 2001, 2000 w algorytmach / Witold Paleczek. Autor: Paleczek, Witold. Akademicka Oficyna Wydawnicza Exit, 2005.

Additional

Technologia informacyjna / Jae K. Shim, Joel G. Siegel, Robert Chi ; przeł. [z jęz. ang.] Adam Oracz. Autor: Shim, Jae K., Siegel, Joel G., Chi, Robert., Oracz, Adam . Tł. Dom Wydawniczy ABC, 1999.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	38	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	37	1,50