

Tadeusz Kosciuszko Cracow University of Technology

Course Card

Faculty of Civil Engineering

Field of study: Civil Engineering

Study profile: general academic

Study form: full-time

Field of study code: BUD

Study cycle: 1st

Specialty: no specialty

1 COURSE INFORMATION

Course name	Technologia informacyjna
Course name in English	Information Technology
Course code	WIL BUD oIS A4 24/25
Course category	Przedmioty ogólne
No. of ECTS points	2.00
Semester	2

2 CLASS TYPE, NUMBER OF HOURS ACCORDING TO THE STUDY PLAN

Semester	Lecture	Class exercise	Laboratory	Computer lab	Design exercise	Seminar
2	15	0	0	15	0	0

3 COURSE OBJECTIVES

Objective 1 Development of skills in formulation and analysis of algorithms

Objective 2 Introduction to use of computers for computational tasks

Objective 3 Development of understanding the reasons and consequences of finite precision arithmetics of computer chips.

Objective 4 Enhancement of general information technology knowledge, presentation of selected application of computers in engineering simulations.

Objective 5 Upgrading the skills related to software engineering and programming that are essential in modern, simulation based scientific research.

4 PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1 General knowledge and skills in high school mathematics.

5 LEARNING OUTCOMES

LO1 Skills Formulation of algorithms based on sequences of algebraic calculations.

LO2 Skills Ability to use selected applications: Octave/Matlab, gnuplot

LO3 Knowledge Basic programming skills including usage of : functions, conditional statements, "for" loops, "while" loops. .

LO4 Skills Ability to visualise scalar and vector functions of one or two variables.

LO5 Knowledge Students are aware of the significance of the concepts of Open Source and Open Science for scientific and technological development of humankind.

6 COURSE CONTENT

Lecture		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
L1	How computer works: basic principles and components.	1
L2	Introduction to Octave as numerical computations environment. The concepts of Open Source and Open Science	2
L3	Algorithmic approaches to problem solving. Basic algorithms. Computational complexity. Convergence of iterative algorithms.	4
L4	Elements of computer graphics. Data visualisation. Visualisation of functions.	3
L5	Computer simulations in science and engineering.	3
L6	Computers' internal data representation. Positional systems. Binary system. Integer numbers. Floating point numbers.	2

Laboratory computer		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
K1	Basics of operating system.	2

Laboratory computer		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
K2	Running programs in batch and interactive mode.	2
K3	Conditional statement. Simple and complex logical statements.	2
K4	Enumeration loops, "for" statement.	2
K5	Conditional loops, "while" statement.	2
K6	Sequences and limits. Matrices as data arrangement. Accessing matrix elements.	2
K7	Recursive functions.	3

7 TEACHING TOOLS

N1 Lectures

N2 Computer lab exercises

N3 Individual tutoring

8 Student workload

Activity form	Number of hours of activity
Hours realized in contact with the teacher	
Hours resulting from the study plan	30
Consultation hours	0
Exams and tests during session	0
Hours of autonomous student work	
Preparing for classes, studying literature	15
Developing results	5
Preparing of reports, projects presentations, discussion	0
individual exercises	10
Total number of hours devoted to the subject	60
Total number of ECTS points	2.00

9 Methods of grading

Partial grades

F1 Practical exercises

Summary grade

P1 Average of marks