Faculty of Mathematics and Computer Science

Course title: The MATLAB package

ECTS credit allocation (and other scores): 3.5

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English /Polish

Number of hours per semester: 45 classes

Course coordinator/ Department and e-mail: Mariusz Bodzioch / WMiI, mariusz.bodzioch@matman.uwm.edu.pl

Type of classes: classes

Substantive content

CLASSES: An introduction to the MATLAB program. Algebraic operations on vectors and matrices. Data visualisation, 2- and 3-dimensional graphs. Animations. Solving linear equation systems. Function interpolation and approximation. Symbolic calculations. Solving ordinary differential equations and their systems. Phase portraits. If, switch, for and while commands. Recursion. Image processing. Simulink.

Learning purpose: To master the MATLAB programming environment at a basic level, enabling the use of MATLAB's built-in functions and the creation of simple functions and scripts for personal use.

On completion of the study programme the graduate will gain:

Knowledge: The student knows the fundamentals of the MATLAB program, its advantages and disadvantages, various data formats and structures in the MATLAB programming environment and the basics of MATLAB programming.

Skills: The student can apply mathematical models in broadly understood applications of mathematics. He/she can apply methods of qualitative differential equation theory to investigate deterministic discrete and continuous models. He/she can also formulate and interpret simple population models, work using programs prepared by others, and prepare programs that can be used by others.

Social Competencies: The student is prepared to work in a team, work systematically, extend his/her knowledge and analyse data from multiple sources.

Basic literature: 1) J. Brzózka, L. Dobroczyński, MATLAB: Środowisko obliczeń naukowo-technicznych, PWN, 2018; 2) B. Mrozek, Z. Mrozek, MATLAB i Simulink. Poradnik użytkownika, Helion, 2017; 3) https://www.mathworks.com/

Supplementary literature: 1) W. Sradomski, MATLAB Praktyczny podręcznik modelowania, Helion, 2015.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 1.88 ECTS points.

Student's independent work: 1.62 ECTS points.