Faculty of Technical Sciences

Course title: Programming Languages

ECTS credit allocation (and other scores): 3

Semester: autumn

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 45

Course coordinator/ Department and e-mail: Wojciech Sobieski / Department of Mechanical Engineering and the Fundamentals of Machine Design / wojciech.sobieski@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Learning Fortran programming in Windows and Linux Operating Systems. Data visualisation by the use of the Gnuplot environment (2D) and the VTK file format (3D). Preparing Graphical User Interfaces with the use of the Free Pascal / Lazarus environment.

LECTURES: Generations of programming languages. Introduction to programming. Fortran compilers. Elements of programming languages. Instructions of programming languages. Algorithms. Good practices in programming.

Learning purpose: Creating software for engineering and scientific calculations focused on the speed of operation as well as data visualisation in 2D and 3D space.

On completion of the study programme the graduate will gain:

Knowledge: Basic knowledge about elements and instructions applied in the so-called imperative programming. Basic knowledge on data visualisation on 2D and 3D space.

Skills: Practical ability to use the Fortran programing language, the Gnuplot environment and the VTK file format.

Social Competencies: Implementation of IT projects in Windows and Linux operating systems based on the Free Software.

Basic literature: 1. Adams J.C., Brainerd W.S, Martin J.T., Smith B.T, Wagener J.L.: Fortran 90 Handbook. McGraw-Hill, 1992, 2. Chivers I.D., Sleightholme J.: Introduction to Programming with Fortran. Springer, 2006. 3. Brainerd W.S.: Guide to Fortran 2003 Programming. Springer, 2009.

Supplementary literature: 1. Using GNU Fortran [on-line]. URL: https://gcc.gnu.org/onlinedocs/, 2. Gnuplot Documentation [on-line]. URL: http://www.gnuplot.info/documentation.html, 3. VTK File Format [on-line], URL: https://vtk.org/wp-content/uploads/2015/04/file-formats.pdf , 4. Free Pascal [on-line], URL: https://www.freepascal.org/docs.html.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 45

Student's independent work: 30