COURSE FOR EXCHANGE STUDENTS

1. **Course title** Computational tools

2. **Course code**	3. **Teaching method** The major parts of the course are prepared in electronics form and will be delivered to the students systematically during the course.
4. **Type of course** Optional	5. **Semester 6**
6. **Number of credits**	7. **Level of course** basic
8. **Numbers of hours per week** 2 (exercises)	9. **Numbers of hours per semester** Exercises 30h

10. **Language of instruction:** English

11. **Name of lecturer** dr inż Katarzyna Kazimierska-Drobny

12. **Prerequisites**

No previous programming experience is required. Computer skills

13. **Goal of the course**

The aim of this course is to introduce the elements and practicalities of computer programming through the MATLAB mathematical computing environment. Upon the completion of the course, the participants will gain a comprehensive understanding of the basic concepts of programming in Matlab and Simulink. The course should provide comprehensive knowledge and skills for participants to build user-friendly interface using MATLAB. At the end of the course, students should be able to use MATLAB and Simulink in their own work, and be prepared to deepen their MATLAB programming skills.

14. **Course contents**

First the The MATLAB User Interface will be introduced. This will show the main features of the MATLAB integrated design environment and its user interfaces. Next MATLAB variables as data containers will be presented. Two essential operations will be emphasized: creating variables and accessing the data the variables contain. The part will also introduce MATLAB operations for computing with data. The third section will focus on M-Files for the setting for MATLAB programming. This will give an overview of how to write, edit, run, and debug M-Files. The distinction between script and function M-files is highlighted, and basic programming structures and best practices will be introduced. Than the Plotting and Visualization will be practised in Matlab. Following part will presents techniques for building graphical user interfaces (GUIs) in MATLAB with application of GUIDE. Attendees will learn about user interface controls, such as push buttons and text boxes, and how to and how to use them to create a robust GUI. Penultimate lectures will focus on work with SIMULINK. The students will be taught with discrete and continuous system modeling in Simulink. The last part will give a simple overview and introduction to finite element analysis using Pde Toolbox.

15. **Assessment methods**

There is no exam during the lectures. Only active participation in the lectures and passing test will be required.

16. **Recommended Reading**

1. Gilat A.: Matlab. An Introduction with applications. John Wiley & Son, 2005.
2. Marchand P., Holland O.T.: Grapfics and GUIs with Matlab. Chapman &Hall/CRC, 2003.
3. Partial Differentional Equation Toolbox. For use with Matlab. The MathWorks user's guide.