COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fundamentals of computer science [S1FT2>PI]

Course

Field of study
Technical Physics

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
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Knowledge of the basics of PC operation Support for a PC with any operating system Ability to work individually, active attitude when solving problems

Course objective

The purpose of the course is to prepare students to work with software used in an academic environment. In particular, students will become familiar with the issues of processing and analysis of data (measurement and other) with particular emphasis on their representation on two- and three- dimensional charts (GNUPlot, Origin), as well as their processing in spreadsheets. In addition, students will be introduced to the text composition system, including the creation of basic types of documents (articles, papers, presentations and theses) necessary for engineering and scientific practice. The basics of working with vector and bitmap graphics will also be introduced, to the extent that their knowledge is necessary for the presentation of diagrams and illustrations in scientific papers. The course is a preparation for the classes held in the following semesters of the first and second level of education.Issues of safety in the use of computer systems and licensing of computer software will also be addressed.

Course-related learning outcomes

Knowledge:
1. knowledge of operating systems
2. knowledge of data processing
3. computer safety
4. principles of editing and typesetting documents, creating illustrative graphics, and presenting measurement data
5. knows and understands the principles of software licensing

Skills:
1. operating a PC with the GNU/Linux operating system installed
2. use of Bash, sed, gnuplot, vim and other software, including creating and running shell scripts, and using compilers from the GCC package
3. create shell scripts to process and format data sets (measurement and other) for graphical presentation
4. create scientific graphs and perform calculations on large amounts of measurement data
5. preparation of an engineering paper/report in the format applicable at WIMiFT
6. preparation of publication-quality graphics

Social competences:
1. is aware of improving his/her computer skills

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: final test.
Laboratory exercises: test of practical skills with the use of computer and software.

Programme content

Operating systems. Types of computer software licences. Issues of experimental data processing and presentation. Creation of scientific documents. Issues of safety in the use of information technology and computers. Basic issues of computer graphics.

Course topics

1. the GNU/Linux operating system and its operation; basic types of computer software licences,
2. the processing of data sets, their formatting and methods of graphical presentation in two- and three-dimensional charts, the Origin program and GNUPlot
3. operation of the Bash shell and its basic instructions, input/output operations and methods of their redirection,
4. creating scripts of interpreted languages (using the Bash shell, gnuplot, sed, etc. as examples) in the vim text editor,
5.Creation of basic document types in the LaTeX text composition system.
6. creation and processing of raster graphics
7. creation of scientific publications, cross-references, references, illustrations, automation of object enumeration processes - LibreOffice Writer.

Teaching methods

1. Lecture: multimedia presentation, presentation illustrated with examples given on the blackboard.
2. Laboratory exercises: practical exercises, performing experiments, discussion, team work.

Bibliography

Basic:
1. Autorskie materiały dydaktyczne udostępniane studentom w formie elektronicznej
2. Dokumentacja wykorzystywanego oprogramowania

Additional:
1. William Stallings, Organizacja i architektura systemu komputerowego, WNT

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00