COURSE DESCRIPTION CARD - SYLLABUS

Course name
Scripting languages [S1MiKC1E>JS]

Course

Field of study
Microelectronics and Digital Communication

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr inż. Paweł Sroka
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Lecturers

Prerequisites

Student starting this course should have basic knowledge of the high school-level mathematics and physics. Moreover, a student should be acquianted with the use of a PC/notebook. Finally, student should understand the necessity to acquire a new knowledge and skills stemming from a chosen field of studies.

Course objective

The main aim of this course is to teach students the basic knowledge and skills in programming using selected script languages. Moreover, methods and tools for storing and reading data, as well as processing and presenting the results using selected script languages are taught.

Course-related learning outcomes

Knowledge:
1. Has a solid knowledge of construction and implementation of computer programmes and algorithms and data processing using the learned scripting languages.

Skills:
1. Is able to prepare simple applications using learned scripting languages with the purpose of analysis

and solving of problems related to the field of study.
2. Is able to store, present and process the collected data in numerical or graphical form using learned scripting languages.

Social competences:
1. Understands the need to further extend the knowlegde about scripting languages; is aware that the knowledge and skills in this area evolve quickly.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The abilities acquired during the laboratories are verified with 8-15 practical exercises, relying on implementation of specific programs or algorithms using selected script languages, according to the provided instructions. Each exercise will be graded with a specific number points depending on the completeness of the provided report and the complexity of the task. The final grade will be also influenced by the overal engagement and dedication to work by the student, and, eventually, realization of additional homeworks. The final grade will depend on the percentage of collected points with the passing threshold equal to 50% of the total numer of points. The grading scale is as follows:
below 50% - 2,0
50% to 60% - 3,0
above 60% to 70% - 3,5
above 70% to 80% - 4,0
above 80% to 90% - 4,5
above 90% - 5,0.

Programme content

This course presents and teaches the theoretical and practical aspects of using of selected scripting languages to solve selected problems in mathematics, computer science and telecommunications. The course topics comprise the basics of implementation of computer programs using scripting languages, including the details of their syntax, as well as methods of storing and presentation of data.

Course topics

Laboratory exercises consist of the following topics:
1. Basic elements and syntax of selected scripting languages: data types, operators and precedence, input/output operations (4 h).
2. Iterative programming (loops) and decision making using selected script language (4 h).
3. Basic data structures in selected programming language: arrays, lists and dictionaries (6 h).
4. Procedural programming using selected programming language - functions and modules. Built-in functions and creating own custom functions (4 h).
5. Data processing using selected script language - storing and reading of files (3 h).
6. Graphical presentation of data (results) using selected script language (3 h).
7. Errors detection and correction using selected script language.Handling of exceptions and input data validation (2 h).
8. Use of selected libraries in selected script language (4 h).

Teaching methods

Laboratories: realization of exercises using computers according to instructions provided by the teacher - practical exercises, supplemented with multimedia presentation.

Bibliography

Basic:
Mark Lutz, Python. Wprowadzenie. Wydanie V, Helion 2020
Piotr Wróblewski, "Algorytmy w Pythonie : techniki programowania dla praktyków", Helion, 2022

Additional:
Robert Johansson, Matematyczny Python. Obliczenia naukowe i analiza danych z użyciem NumPy, SciPy i Matplotlib, Helion 2021

Qingkai Kong, Timmy Siauw, Alexandre Bayen, "Python Programming and Numerical Methods - A Guide for Engineers and Scientists" (online)
www.w3schools.com (online)

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00