#### card of course

|  |  |
| --- | --- |
| Subject name | Foundations of programming |

1. The placement of the subject in the study system

|  |  |
| --- | --- |
| 1.1. Field of study | Computer science |
| 1.2. Form and path of study | Full-time/Part-time |
| 1.3. Level of education | First-cycle studies |
| 1.4. Study profile | Practical |

|  |  |
| --- | --- |
| 1.5. Specialty | - |
| 1.6. Subject Coordinator | Dr Michał Kalisz; mgr Emil Tomczyk |

2. General characteristics of the subject

|  |  |
| --- | --- |
| 2.1. Belonging to a subject group | Directional/Practical |
| 2.2. Number of ECTS | 5 |
| 2.3. Language of lectures | English |
| 2.4. Semesters in which the subject is taught | I |
| 2.5.Criteria for selecting course participants | - |

1. Learning outcomes and course delivery
   1. Subject Objectives

|  |  |
| --- | --- |
| No. | Subject Objectives |
|
| C1 | To provide the student with knowledge about programming tools that can be used to acquire, analyze and process data. |
| C2 | Students will acquire practical knowledge and skills in programming in Python. |
| C3 | Acquiring the ability to use programming constructs to create computer programs. |
| C4 | Shaping abstract thinking and programming thinking. |
| C5 | Acquiring practical skills in building computer programs. |

* 1. Subject-specific learning outcomes, divided into knowledge , skills and competences , with reference to the directional learning outcomes

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Description of subject  learning outcomes | Reference to  directional effects  learning (symbols) | Method of implementation (mark with "X") | | | |
| ST | | NST | |
| Classes at the University | Activities on  the platform | Classes at the University | Activities on  the platform |
| After passing the course, the student knows and understands **the knowledge** | | | | | | |
| W1 | The student has knowledge of the basics of algorithms. | INF\_W08  INF\_W11  INF\_W20 | X |  |  | X |
| W2 | The student has knowledge about working with variables, knows how to create, convert, and save them. | X |  |  | X |
| W3 | The student has knowledge of programming constructs, such as the for loop, while loop, if conditional statements, functions. | X |  |  | X |
| W4 | The student knows and understands what it is to iterate over objects such as lists, dictionaries, and strings. | X |  |  | X |
| W5 | The student knows how to work with external modules. | X |  |  | X |
| W6 | The student has knowledge of typical programming problems. | X |  |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | Is able to use programming environments, is able to create working folders and install add-ons. | INF\_U15 INF\_U17 INF\_U19  INF\_U23 | X |  | X |  |
| U2 | Is able to create code to enter data into a program. | X |  | X |  |
| U3 | Is able to implement his own, functional program. | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | Is ready to think programmatically and work in accordance with the principles of work organization. | INF\_K04 | X |  | X |  |

3.3. Forms of teaching and their number of hours - Full-time studies (ST), Part-time studies (NST)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Path | Lecture | Exercises | Design | Workshop | Laboratory | Seminar | Lecturer | Classes conducted using distance learning methods and techniques in the form of a lecture | Other | **ECTS points** |
| **ST** | 30 |  |  |  | 30 |  |  |  |  | 5 |
| **NST** |  |  |  |  | 15 |  |  | 10 |  | 5 |

3.4. Content of education (separately for each form of classes: (W, ĆW, PROJ, WAR, LAB, LEK, OTHER). It should be marked (X) how the given content will be implemented (classes at the university or classes on the e-learning platform conducted using distance learning methods and techniques)

TYPE OF CLASS: LECTURE

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Introduction to programming. | W6 | X |  |  | X |
| 2. | Algorithms. | W1 | X |  |  | X |
| 3. | Programming paradigms. | W6 | X |  |  | X |
| 4. | Overview and classification of programming languages. | W6 | X |  |  | X |
| 5. | Data types, operators, modifiers. | W2, W4, W6 | X |  |  | X |
| 6. | Program structure. Variables and constants. | W1, W2 | X |  |  | X |
| 7. | Conditional statements. | W3 | X |  |  | X |
| 8. | Iterative statements. | W4 | X |  |  | X |
| 9. | Data structures. | W6 | X |  |  | X |
| 10. | Functions. | W5, W6 | X |  |  | X |
| 11. | File handling. | W5, W6 | X |  |  | X |
| 12. | Introduction to object orientation. | W5, W6 | X |  |  | X |
| 13. | Creating documentation and a description of the program being created. | W6, K1 | X |  |  | X |
| 14. | Summary of classes and discussion of grades. |  | X |  |  | X |

TYPE OF CLASS: LABORATORY

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Introduction to programming. | U1, K1 | X |  | X |  |
| 2. | Strings and their handling. | U1, U2 | X |  | X |  |
| 3. | If conditional statement. | U2 | X |  | X |  |
| 4. | While loop, counter loop. | U2 | X |  | X |  |
| 5. | Lists, dictionaries and operations on them. | U2 | X |  | X |  |
| 6. | The for loop, iterating over data structures. | U2 | X |  | X |  |
| 7. | Functions, function definitions. | U2 | X |  | X |  |
| 8. | File handling, error handling. | U3 | X |  | X |  |
| 9. | Package modules and import libraries. | U3 | X |  | X |  |
| 10. | Group work. | U3, K1 | X |  | X |  |
| 11. | Summary of classes and discussion of grades. |  | X |  | X |  |

3.5. Methods of verifying learning outcomes (indication and description of methods of conducting classes and verification of achievement of learning outcomes and method of documentation)

|  |  |  |  |
| --- | --- | --- | --- |
| Subject Effects | Teaching methods | Methods of verifying learning outcomes | Documentation methods |
| KNOWLEDGE | | | |
| W1-W6 | Multimedia presentation | Theoretical examination on the content of the lectures. | Archived exam |
| SKILLS | | | |
| U1-U3 | Practical classes performed at computer stations  Group work in laboratory classes | A project for the final exam, which involves creating a program yourself. The type of program and its functionalities will be indicated in the instruction by the instructor (100% of the final grade from the lab)  An exercise carried out during classes in groups of 2-3 people, consisting of writing a functional program. The type of program and its functionalities will be indicated in the instruction by the class leader (not subject to assessment). | Archived files. |
| SOCIAL COMPETENCES | | | |
| K1 | Practical classes performed at computer stations  Group work in laboratory classes | A project for the final exam, which involves creating a program yourself. The type of program and its functionalities will be indicated in the instruction by the instructor (100% of the final grade from the lab)  An exercise carried out during classes in groups of 2-3 people, consisting of writing a functional program. The type of program and its functionalities will be indicated in the instruction by the class leader (not subject to assessment). | Archived files. |

3.6. Assessment criteria for the achieved learning outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Learning effect | For a grade of 3 or "pass."  the student knows and understands/is able to/is ready to | For a grade of 3.5, the student knows and understands/is able to/is ready to | For a grade of 4, the student knows and understands/is able to/is ready to | For a grade of 4.5, the student knows and understands/is able to/is ready to | For a grade of 5, the student knows and understands/is able to/is ready to |
| W | 51-60% of knowledge indicated in learning outcomes | 61-70% of knowledge indicated in learning outcomes | 71-80% of knowledge indicated in learning outcomes | 81-90% of knowledge indicated in learning outcomes | 91-100% of knowledge indicated in learning outcomes |
| U | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |
| K | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |

3.7. Literature

**Basic**

Baka Benjamin; Python Data Structures and Algorithms. Improve application performance with graphs, stacks, and queues Packt Publishing; Birmingham 2017

[Python. Wprowadzenie. Wydanie V](https://helion.pl/ksiazki/python-wprowadzenie-wydanie-v-mark-lutz,pyth5v.htm#format/d), Mark Lutz, 2021;

[Python dla każdego. Podstawy programowania. Wydanie III](https://helion.pl/ksiazki/python-dla-kazdego-podstawy-programowania-wydanie-iii-michael-dawson,pytd3v.htm#format/d), Michael Dawson, 2020;

**Supplementary**

https://docs.python.org/3/

4. Student workload - ECTS points balance

|  |  |  |
| --- | --- | --- |
| **Types of student activity** | **Student Load** | |
| **ST** | **NST** |
| **Classes requiring direct contact between the student and the academic teacher at the university premises** | **60** | **25** |
| Classes included in the study plan | 60 | 25 |
| **Student's own work** | **65** | **100** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 30 | 50 |
| Preparation for passing classes | 35 | 50 |
| **TOTAL STUDENT HOURLY LOAD** | **125** | **125** |
| **Number of ECTS points** | **5** | **5** |

|  |  |
| --- | --- |
| Last change date | 30/09/2024 |
| The changes were introduced | INF Education Quality Team |
| The changes were approved | Arkadiusz Gwarda, M.A. |