

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Programming Methods, PG_00198460                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Field of study                              | Informatics                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Academic year of realisation of subject                                                                                                                                                                                                                                                             |                                     | 2026/2027                                                                                                            |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                                                                                                          |                                                          | Subject group                                                                                                                                                                                                                                                                                       |                                     | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | part-time studies                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Mode of delivery                                                                                                                                                                                                                                                                                    |                                     | at the university                                                                                                    |            |     |
| Year of study                               | 1                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Language of instruction                                                                                                                                                                                                                                                                             |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 2                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | ECTS credits                                                                                                                                                                                                                                                                                        |                                     | 3.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Assessment form                                                                                                                                                                                                                                                                                     |                                     | credit                                                                                                               |            |     |
| Conducting unit                             |                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                          |                                                          | dr Tomasz Borzyszkowski                                                                                                                                                                                                                                                                             |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                    |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                 | Lecture                                                  | Tutorial                                                                                                                                                                                                                                                                                            | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                       | 10.0                                                     | 0.0                                                                                                                                                                                                                                                                                                 | 10.0                                | 0.0                                                                                                                  | 0.0        | 20  |
|                                             | E-learning hours included: 0.0                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                                                                                                                                                                                                                                                           | Participation in didactic classes included in study plan |                                                                                                                                                                                                                                                                                                     | Participation in consultation hours |                                                                                                                      | Self-study | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                       | 20                                                       |                                                                                                                                                                                                                                                                                                     | 0.0                                 |                                                                                                                      | 55.0       | 75  |
| Subject objectives                          | Familiarisation with modern methods of quality assurance in IT projects through software testing and validation. Understand the requirements for IT systems (e.g. availability, performance) and the tools supporting automated software testing. To become familiar with the practices used in the automation of various types of tests (e.g. unit, integration and user interface tests). |                                                          |                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                      |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Subject outcome                                                                                                                                                                                                                                                                                     |                                     | Method of verification                                                                                               |            |     |
|                                             | [INFOL3_W06] knows and understands advanced models of database systems, with particular emphasis on the relational model                                                                                                                                                                                                                                                                    |                                                          | The student describes the challenges involved in testing systems that use advanced relational database models and explains strategies for isolating test data, mocking the data access layer and restoring the database state in automated test scenarios.                                          |                                     | [SW2] presentation/project/paper/report                                                                              |            |     |
|                                             | [INFOL3_U06] is able to select and apply appropriate IT methods and tools to solve complex problems, is able to use acquired knowledge by appropriately selecting sources and information derived from them, and perform evaluation, critical analysis, and synthesis of this information                                                                                                   |                                                          | The student is able to plan the testing process by formulating test scenarios, select appropriate test automation tools and integrate them into the software deployment process (CI/CD), and carry out a critical assessment of the quality of the system under analysis based on the test results. |                                     | [SU2] presentation/project/paper/report                                                                              |            |     |

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| Subject contents                                               | Methodologies and types of software tests (test pyramid)Software test planning as part of the software development cycle (formulation of test scenarios)Test automation: - automation tools - automated testing as a means of quality assurance in the software development cycle - integration of automated testing into the implementation process |                                                                                                                                                                   |                               |
| Prerequisites and co-requisites                                |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                   |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                                                                 | Percentage of the final grade |
|                                                                | project presentation                                                                                                                                                                                                                                                                                                                                 | 51.0%                                                                                                                                                             | 100.0%                        |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                     | 1 Beck Kent, TDD. The art of creating good code Helion Publishing, 2020.2 Harry J.W. Percival. TDD in practice. Reliable code in Python. Helion Publishing, 2020. |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                             | None                                                                                                                                                              |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                   |                               |
| Example issues/<br>example questions/<br>tasks being completed | 1. Using TDD methodology, write a class/function called hamming that calculates the Hamming distance for given test data.2. For given requirements, scenarios and use cases, design and implement behavioural tests using the behave library in Python.                                                                                              |                                                                                                                                                                   |                               |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                   |                               |

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