#### card of course

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| --- | --- |
| Subject name | Backend technologies |

1. The placement of the subject in the study system

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| 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 |

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| 1. 5. Specialty | Web Technologies and the Internet of Things |
| 1.6. Subject Coordinator | Dr inż. Kamil Żyła |

2. General characteristics of the subject

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| 2.1. Belonging to a subject group | Optional/practical |
| 2.2. Number of ECTS | 4 |
| 2.3. Language of lectures | English |
| 2.4. Semesters in which the subject is taught | V |
| 2.5.Criteria for selecting course participants | For the specialization: Web Technologies and Internet of Things |

1. Learning outcomes and course delivery
	1. Subject Objectives

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| No. | Subject Objectives |
|
| C1 | Familiarization with the tools for building backend applications and acquiring skills in using them. |
| C2 | Familiarization with the issues of creating backend applications. |
| C3 | Familiarization with the issues of implementing backend applications. |
| C4 | Acquiring the ability to create a backend application and apply good practices when writing code. |

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

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| --- | --- | --- | --- |
| No. | Description of subject learning outcomes | Reference to directional effectslearning (symbols) | Method of implementation (mark "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 | Concepts related to creating backend applications | INF\_W20 |  | X |  | X |
| W2 | Tools and technologies for building backend applications |  | X |  | X |
| W3 | Basic ways to ensure good code quality |  | X |  | X |
| After passing the course, the student is **able** to: |
| U1 | Choose the right tool for the task at hand | INF\_U12 INF\_U15 INF\_U19 INF\_U20 | X |  | X |  |
| U2 | Create and implement a backend application | X |  | X |  |
| U3 | Apply basic best practices when writing code | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** |
| K1 | Teamwork on the code | INF\_K04 | X |  | X |  |
| K2 | Properly defining priorities during the implementation of a programming task | X |  | X |  |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |  |  | 20 |  | 4 |
| **NST** |  |  |  |  | 15 |  |  | 10 |  | 4 |

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

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| --- | --- | --- | --- |
| 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 creating backend applications. | W1 |  | X |  | X |
| 2. | Backend application code versioning. | W2 |  | X |  | X |
| 3. | Tools for building backend applications. | W2 |  | X |  | X |
| 4. | Backend application project structure. | W2, W3 |  | X |  | X |
| 5. | Good practices for writing backend application code. | W3 |  | X |  | X |
| 6. | Backend applications using a database. | W2 |  | X |  | X |
| 7. | Communication between backend applications. | W2 |  | X |  | X |
| 8. | Creating logs and documenting the backend application. | W2, W3 |  | X |  | X |
| 9. | 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. | Backend application code versioning. | U2, K1 | X |  | X |  |
| 2. | Practical introduction to the tools for building backend applications. | U2, U1 | X |  | X |  |
| 3. | Structuring your backend application project. | U2, U3, K2 | X |  | X |  |
| 4. | Practical applications of good practices for writing backend application code. | U3 | X |  | X |  |
| 5. | Implementation of database usage by the backend application. | U2 | X |  | X |  |
| 6. | Implementing communication between backend applications. | U2 | X |  | X |  |
| 7. | Creating logs and documenting the backend application. | U2 | X |  | X |  |
| 8. | 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)

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| --- | --- | --- | --- |
| Subject Effects | Teaching methods | Methods of verifying learning outcomes | Documentation methods |
| KNOWLEDGE |
| W1-W3 | lecture, discussion, project preparation | A written paper containing content related to the topics included in the syllabus - credit for lectures | A graded written assignment |
| SKILLS |
| U1-U3 | discussion, group work, project preparation | Carrying out a project in the field of backend technologies, concerning the program content listed in the syllabus. Detailed guidelines regarding the scope of work are provided to students during classes by the instructor. | Rated project |
| SOCIAL COMPETENCES |
| K1-K2 | discussion, group work, project preparation | Carrying out a project in the field of backend technologies, concerning the program content listed in the syllabus. Detailed guidelines regarding the scope of work are provided to students during classes by the instructor. | Rated project |

3.6. Assessment criteria for the achieved learning outcomes

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| **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**

1. Oficjalny podręcznik do narzędzia GIT https://git-scm.com/book/en/v2
2. Strona domowa narzędzia Spring Boot https://spring.io/projects/spring-boot

**Supplementary**

1. Craig Walls, "Spring w akcji. Wydanie V", Helion, 2019.

4. Student workload - ECTS points balance

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| --- | --- |
| **Types of student activity** | **Student Load** |
| **ST** | **NST** |
| **Classes requiring direct contact between the student and the academic teacher at the university premises** | **50** | **25** |
| Classes included in the study plan | 50 | 25 |
| **Student's own work** | **50** | **75** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 25 | 40 |
| Preparation for passing classes | 25 | 35 |
| **TOTAL STUDENT HOURLY LOAD** | **100** | **100** |
| **Number of ECTS points** | **4** | **4** |

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| --- | --- |
| Last change date | 30.09.2024 |
| The changes were introduced | Zespół ds. Jakości Kształcenia INF |
| The changes were approved | Mgr Arkadiusz Gwarda |