#### card of course

|  |  |
| --- | --- |
| Subject name | * + - 1. **IT systems integration** |

**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** |

|  |  |
| --- | --- |
| 1.5. Specialty | **-** |
| 1.6. Subject Coordinator | **mgr inż. Jacek Rożek** |

**2. General characteristics of the subject**

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| 2.1. Belonging to a subject group | **Directional/Practical** |
| 2.2. Number of ECTS | **2** |
| 2.3. Language of lectures | **English** |
| 2.4. Semesters in which the subject is taught | **VII** |
| 2.5.Criteria for selecting course participants | **-** |

1. **learning outcomes and course delivery**
   1. **Subject Objectives**

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| --- | --- |
| **No.** | **Subject Objectives** |
|
| C1 | Learn the basics of systems integration concepts. |
| C2 | Understanding the challenges associated with the integration process. |
| C3 | Integration (coordination) of business processes using one IT system. |
| C4 | Integration of features, functionality and accumulated knowledge contained in multiple applications. |

* 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 effects**  **learning (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 | The student understands how to integrate in the data layer for different system architectures . | INF\_W04 INF\_W07  INF\_W12  INF\_W20 |  | X |  | X |
| W2 | Knows the principles of planning and designing the integration process. |  | X |  | X |
| W3 | Understands how to prepare and conduct IT system integration in accordance with the rules of the art. |  | X |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | Is able to prepare the process of integration of IT systems. | INF\_U01 INF\_U07 INF\_U22 | X |  | X |  |
| U2 | Is able to prepare and plan the process of integrating IT systems. | X |  | X |  |
| U3 | Is able to independently formulate and solve an integration problem. | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | Discussing and sharing ideas and  drawing conclusions | INF\_K01 | X |  | X |  |
| K2 | Understands the need to continually deepen knowledge in the field of IT systems integration. | X |  | X |  |
| K3 | Understands the importance of cooperation with other team members for the successful implementation of an integration project | 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** |  |  |  | 20 |  |  |  | 15 |  | 2 |
| **NST** |  |  |  | 10 |  |  |  | 10 |  | 2 |

**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.** | Service-oriented architecture (SOA). | **W1** |  | **X** |  | **X** |
| **2.** | OASIS standards and their place in the integration process. | **W1** |  | **X** |  | **X** |
| **3.** | Integrative architectural patterns. | **W2** |  | **X** |  | **X** |
| **4.** | Identity management in the integration process. | **W1** |  | **X** |  | **X** |
| **5.** | The place of data in systems integration. | **W2** |  | **X** |  | **X** |
| **6.** | Scalability issues as a component of integration. | **W1** |  | **X** |  | **X** |
| **7.** | Integration – overview and discussion. | **W3** |  | **X** |  | **X** |
| **8.** | Summary of classes and discussion of grades |  |  | **X** |  | **X** |

**TYPE OF CLASS: WORKSHOP**

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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.** | One-sided and two-sided integration. | **U1, K1** | **X** |  | **X** |  |
| **2.** | Service-oriented architecture (SOA). | **U2, U3, K3** | **X** |  | **X** |  |
| **3.** | Integrative architectural patterns. | **U1, U2, U3, K2** | **X** |  | **X** |  |
| **4.** | Exchange of information between two IT systems. | **U1, U2, U3, K1, K2, K3** | **X** |  | **X** |  |
| **5.** | Transferring information between two systems. | **U1, U2, U3, U3, K2, K3** | **X** |  | **X** |  |
| **6.** | Transfer of information via a link. | **U1, U2, U3, K2, K3** | **X** |  | **X** |  |
| **7.** | Integration of IT systems in the application. | **U1, U2, U3, K1, K2, K3** | **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** | Multimedia lecture, verbal introduction, analysis of ready-made solutions | Use of materials and content included in the lecture to pass the exam (lecture)  Test containing a set of 20 questions. Scoring:  Score 3: 11 – 12 points  Rating 3.5: 13 – 14 points  Score 4: 15 – 16 points  Rating 4.5: 17 – 18 points  Score 5: 19 – 20 points | Graded exam |
| **SKILLS** | | | |
| **U1-U3** | Discussing sample problems to solve, working together on the problem, practical tasks | Workshop credit: a task in which systems (applications) must be connected so that they can use each other's resources, such as files or devices. The application should be able to exchange data between different IT systems or synchronize with a database. | Graded task |
| **SOCIAL COMPETENCES** | | | |
| **K1-K3** | Discussing sample problems to solve, working together on the problem, practical tasks | Workshop credit: a task in which systems (applications) must be connected so that they can use each other's resources, such as files or devices. The application should be able to exchange data between different IT systems or synchronize with a database. | Graded task |

**3.6. Assessment criteria for the achieved learning outcomes**

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| --- | --- | --- | --- | --- | --- |
| **Learning effect** | **For a grade of 3 or " zal ."**  **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. Thomas Erl Service-Oriented Architecture: Analysis and Design for Services and Microservices, Pearson
2. Langford, G.O., Engineering Systems Integration: Theory, Metrics, and Methods (1st ed.), CRC Press, 2012, 9780429109744

**Supplementary**

1. Poszczególne dokumenty standardów OASIS ze szczególnym uwzględnieniem: AMQP, BCM, CMIS, XACML, MQTT, ODATA, OSLC, SAML, SPML oraz protokołów i metodologii.

**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** | **35** | **20** |
| Classes included in the study plan | 35 | 20 |
| **Student's own work** | **15** | **30** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 7 | 15 |
| Preparation for passing classes | 8 | 15 |
| **TOTAL STUDENT HOURLY LOAD** | **50** | **50** |
| **Number of ECTS points** | **2** | **2** |

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