#### card of course

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| Subject name | * + - 1. **Introduction to Software Engineering** |

**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 | **-** |
| 1.6. Subject Coordinator | **Mgr Daniel Gaszewski** |

**2. General characteristics of the subject**

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| 2.1. Belonging to a subject group | **Directional/Practical** |
| 2.2. Number of ECTS | **4** |
| 2.3. Language of lectures | **English** |
| 2.4. Semesters in which the subject is taught | **III** |
| 2.5.Criteria for selecting course participants | **-** |

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

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| **No.** | **Subject Objectives** |
|
| C1 | Familiarization with the specifics and basics of work organization of the team specifying requirements and producing software. Learning the specific role of the business analyst. |
| C2 | Familiarization with the issues of collecting and analyzing software requirements, leading to the specification of system functions and the data layer. |
| C3 | Acquiring knowledge and skills in business process modeling. |

* 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 | roles in the software development team and the basics of organizing its work, including the specific role of a business analyst | INF\_W07 INF\_W20 INF\_W21 | X |  |  | X |
| W2 | the concept of a business process, types of business processes, and how to visualize them in the form of diagrams | X |  |  | X |
| W3 | the specifics of collecting and analyzing software requirements | X |  |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | develop business process specifications using BPMN notation | INF\_U01 INF\_U06 INF\_U09 INF\_U22 | X |  | X |  |
| U2 | analyze software requirements in terms of specifying individual functions | X |  | X |  |
| U3 | analyze software requirements in terms of specifying the data layer | X |  | X |  |
| U4 | use supporting IT tools to specify software | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | participation in the software specification and production process | INF\_K01  INF\_K06 | X |  | X |  |
| K2 | critical evaluation of one's knowledge, self-education, seeking knowledge from various sources, including experts | X |  | X |  |

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

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| **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 |  |  |  | 30 |  |  |  |  | 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 software engineering, basic concepts. | **W1, W2, W3** | **X** |  |  | **X** |
| **2.** | Organizing the work of the team specifying requirements and producing software. | **W1** | **X** |  |  | **X** |
| **3.** | The process of gathering requirements for software. | **W1, W3** | **X** |  |  | **X** |
| **4.** | Business process modeling. Basic diagrams and elements of BPMN notation. | **W2** | **X** |  |  | **X** |
| **5.** | Business Process Modeling. Events, Decision Points, Actors, Subprocesses in BPMN Notation. | **W2** | **X** |  |  | **X** |
| **6.** | Analysis of software requirements in terms of specifying the data layer. Entity-relationship diagram. | **W3** | **X** |  |  | **X** |
| **7.** | Analysis of software requirements in terms of specifying individual functions. Use cases and scenarios for their implementation. | **W3** | **X** |  |  | **X** |
| **9.** | Summary of classes and discussion of grades |  | **X** |  |  | **X** |

**TYPE OF CLASS: LABORATORY**

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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 the subject - program content, specifics of the work environment and tasks of a business analyst, IT tools supporting the work of a business analyst. | **U1-U4, K1, K2** | **X** |  | **X** |  |
| **2.** | Creating a business description of the "real world" of the designed software, definition of functional and non-functional requirements of the designed software. | **U4, K1, K2** | **X** |  | **X** |  |
| **3.** | BPMN notation - introduction to business process modeling. | **U1, U4, K2** | **X** |  | **X** |  |
| **4.** | BPMN notation - business process models that include events. | **U1, U4, K2** | **X** |  | **X** |  |
| **5.** | BPMN notation - advanced capabilities. | **U1, U4, K2** | **X** |  | **X** |  |
| **6.** | Specifying the software data layer. Entity-relationship diagrams. | **U3, U4, K2** | **X** |  | **X** |  |
| **7.** | Specifying individual software functions - use cases and scenarios for their implementation. | **U2, U4, K2** | **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, preparation of diagrams and descriptions | Lecture credits: exam covering the content covered in class | Graded exam sheet |
| **SKILLS** | | | |
| **U1-U4** | lecture, discussion, preparation of diagrams and descriptions | Assessment of the laboratory: a work/task in the field of software engineering concerning the program content listed in the syllabus. Detailed guidelines regarding the scope of work provided to students by the instructor during classes. | Graded work/task |
| **SOCIAL COMPETENCES** | | | |
| **K1-K2** | lecture, discussion, preparation of diagrams and descriptions | Assessment of the laboratory: a work/task in the field of software engineering concerning the program content listed in the syllabus. Detailed guidelines regarding the scope of work provided to students by the instructor during classes. | Graded work/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. Vliet Hans van, Software engineering: Principles and practice, John Wiley, Chichester, 2008
2. Michał Śmiałek, Kamil Rybiński, "Inżynieria oprogramowania w praktyce. Od wymagań do kodu z językiem UML", Helion, 2023
3. Bartłomiej Gawin, Bartosz Marcinkowski, "Symulacja procesów biznesowych. Standardy BPMS i BPMN w praktyce", Helion, 2013

**Supplementary**

1. Michael J. Hernandez, "Projektowanie baz danych dla każdego. Przewodnik krok po kroku. Wydanie IV", Helion, 2022
2. Karolina Zmitrowicz, "Analiza biznesowa w IT. Lessons learned", Helion, 2024

**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 | 35 |
| Preparation for passing classes | 25 | 40 |
| **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 | INF Education Quality Team |
| The changes were approved | Arkadiusz Gwarda, M.A. |