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| **WSB University Branch/Department of Jaworzno**  |
| **Field of study: Computer Science**  |
| **Subject: Software engineering**  |
| **Educational profile: practical**  |
| **Level of education: undergraduate studies**  |
| **Number of hours per semester**  | 1  | 2  | 3  | 4  |
| I  | II  | III  | IV  | V  | VI  | VII  |
| **Full-time studies** (w/w/lab/pr/e)\*  |   |   |   | **16w / 20ćw**  |  |   |   |
| **Part-time studies** (w/æw/lab/pr/e)  |   |   |   | **12w / 16ćw**  |  |   |   |
| **LANGUAGE OF** **INSTRUCTION**  | Polish  |
| **LECTURER**   | D. Eng. Rafał Deja, Prof. AWSB  |
| **FORM OF ACTIVITIES**  | Lecture, exercises, consultations  |
| **SUBJECT** **OBJECTIVES**   | To familiarise students with the problems associated with the development and maintenance of complex information systems. To introduce the basic principles and methods of customer requirements analysis, design, coding, testing and maintenance of software.  |
| **Reference to learning outcomes**  | **Description of learning outcomes**  | **Means of verification of the effect learning**  |
| **Directional effect**  | **PRK**  |
| **NEWS**  |
| INF\_W04  | P6S\_WG  | The student knows and understands the engineering approach to software development.  | Written exam, Activity in class   |
| INF\_W04  | P6S\_WG  | The student knows and understands the iterative model of software development.  | Written exam, Activity in class   |
| INF\_W04 INF\_W10  | P6S\_WG  | The student knows and understands the techniques and tools associated with software analysis and design and IT project management  | Written exam, Activity in class   |
| **SKILLS**  |
| INF\_U05   | P6S\_UW  | Students will be able to define project objectives, decompose them and develop an implementation plan.  | Performing tasks during practical exercises   |
| INF\_U06 INF\_U03 INF\_U15   | P6S\_UW   | The student is able to collect, analyse requirements, develop a requirements specification and design and implement an information system.  | Performing tasks during practical exercises   |
| INF\_U03  | P6S\_UK  | The student is able to develop the required documentation of the produced software product.  | Performing tasks during practical exercises   |

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| **SOCIAL COMPETENCES**  |
| INF\_K01 | P6S\_KK  | The student is aware of the level of his/her knowledge and skills and understands the need for continuous training for professional and personal development.  | Observation of students during classes  |
| **Student workload (in teaching hours 1h =45 minutes)\*\***  |
| **Stationary Part-time** attendance at lectures = 16 attendance at lectures = 12 participation in exercises = 20 participation in exercises = 16 preparation for exercise = 28 preparation for exercise = 32 lecture preparation = 18 lecture preparation = 22 exam preparation = 10 exam preparation = 10 implementation of project tasks = implementation of project tasks = e-learning = e-learning = Pass/examination = 4 Pass/examination = 4 other (consultation) = 4 other (consultation) = 4 **TOTAL: 100h TOTAL: 100h** **Number of ECTS credits: 4 Number of ECTS credits: 4** **including in practical classes: 2 including in practical classes: 2**  |
| **PREREQUISITES**  | Fundamentals of computer programming. Fundamentals of object-oriented programming. Ability to think abstractly. Knowledge of the basics of computer science and computer use.  |
| **SUBJECT** **CONTENT**  | * The software crisis and its consequences, why software engineering should be studied and the scope of the subject.
* Software life models; the advantages of an iterative approach and working closely with the client.
* Strategic phase: project preparation, cost estimation, planning using MS Project, risk management
* Requirements engineering with particular emphasis on description by use cases.
* Object-oriented modelling and design using UML.
* Software quality control.
* Project management; traditional approaches and lightweight methodologies in software development management.
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| **LITERATURE** **COMPULSORY**  | * K. Sacha - Software engineering, PWN, 2023.
* I. Somerville - Software engineering, PWN, 2020.
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| **LITERATURE** **SUPPLEMENTARY** (including min. 2 items in English; book publications or articles)  | * Craig Larman, UML and design patterns. Object-oriented analysis and design and the iterative model of application development. Wydanie III, Helion 2011
* Martin Fowler, UML Distilled: A Brief Guide to the Standard Object Modeling Language
* Roger Pressman and Bruce Maxim, Software engineering: a practitioner's approach
* Craig Larman, Agile and Iterative Development: A Manager's Guide, Addison-Wesley Professional, 2004
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| **TEACHING** **METHODS**    | * Lecture using multimedia presentations • Encouraging analysis of lecture material.
* Solving problems posed by the tutor independently,
* Brief theoretical introduction using a multimedia projector,
* Demos demonstrating the use of relevant tools, technologies and then performing tasks and project on computers independently and under supervision with guidance from the tutor.
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| **LEARNING AIDS**  | Multimedia projector, materials on moodle platform, MS Teams application, Microsoft Visio  |
|  **PROJECT**  | Not applicable  |
| **FORM AND** **CONDITIONS OF**  **PASSING**  | Written test examination, exercise credit.   |
|  | A prerequisite for obtaining credit is obtaining a positive grade in all forms of credit provided for in the course programme, taking into account the quantitative assessment criteria specified in the Framework System of Student Assessment at the WSB Academy.  |