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|--|--|--|--|--|--|
| FACULTY / DEPARTMENT | | | | | |
| SUBJECT CARD | | | | | |
| Name in Polish ...Analiza biznesowa i systemowa..... | | | | | |
| Name in English ... Business and system analysis..... | | | | | |
| Main field of study (if applicable): | | | | | |
| Specialization (if applicable): | | | | | |
| Level and form of studies: 1st/ 2nd* level, full-time / part-time * | | | | | |
| Kind of subject: obligatory / optional / university-wide * | | | | | |
| Subject code | | | | | |
| Group of courses YES / NO * | | | | | |

| | Lecture | Classes | Laboratory | Project | Seminar |
|---|---|-------------------------------------|--|-------------------------------------|-------------------------------------|
| Number of hours of organized classes in University (ZZU) | 15 | 15 | 30 | | |
| Number of hours of total student workload (CNPS) | 60 | 30 | 60 | | |
| Form of crediting | Examination / crediting with grade * | Examination / crediting with grade* | Examination / crediting with grade* | Examination / crediting with grade* | Examination / crediting with grade* |
| For group of courses mark (X) final course | X | | | | |
| Number of ECTS points | 2 | 1 | 2 | | |
| including number of ECTS points for practical (P) classes | | | | | |
| including number of ECTS points for direct teacher-student contact (BK) classes | 0,9 | 0,9 | 1,2 | | |

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of OMG standards (UML, OCL, SysML), modeling skills with the use of these standards.
2. General knowledge of tasks in the software development process (business analysis, requirements specification, design, implementation and testing).

SUBJECT OBJECTIVES

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|-----------|--|
| C1 | Gaining the familiarization with methods and practices of business and system analysis - acquisition of the ability to execution of software development process tasks, understanding of relationships between different products of software development process. |
| C2 | Educating and complementing the abilities to use the OMG standards in business processing modeling and system analysis methods in computer engineering practices. |
| C3 | Gaining the practical ability to work with a modeling tool. |
| C4 | Gaining the practical skills in teamwork. |

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Lists and describes the stages of the software development process

PEK_W02 Lists and describes the artifacts (in particular models) developed at various stages of the software development process and defines relationships between them. Classifies models according to the MDA approach

PEK_W03 Lists and classifies the elements of OMG standards

relating to skills:

PEK_U01 Is able to conduct the business and system analysis.

PEK_U02 Applies the OMG standards to the specification and documentation of the software development process artifacts

PEK_U03 Selects appropriate means of OMG standards (diagrams) to the problem being solved.

PEK_U04 Is able to apply the modeling language extension mechanisms to adapt model elements to the problem.

PEK_U05 Verifies the compatibility of business and system analysis artifacts.

PEK_U06 Uses of modeling tools

PROGRAMME CONTENT

| Form of classes - lecture | | Number of hours |
|---------------------------|--|-----------------|
| Lec 1 | Introduction: – models categorized by the MDA approach (CIM/PIM/PSM), – presentation of business and system analysis approach – roles of participants, artifacts, and standards used in a software development process. | 1 |
| Lec 2 | Business modeling (UML class diagram, DMN, BPMN diagram). Business requirements specification (SysML requirements diagram, user stories). | 4 |
| Lec 3 | User requirements specification (UML use case diagram). Data modeling: definition of a structure of the information model elements (UML class diagram) and life cycle of selected elements of this model (UML state machine diagram). | 3 |
| Lec 4 | Specification of use cases scenarios (UML activity diagram). Definition and application of analysis patterns in the description. | 4 |
| Lec 5 | Navigation maps for use cases (UML class diagram). User interface prototype (VP user interface diagram, SysML requirements diagram). | 3 |
| Total hours | | 15 |

| Form of classes - class | | Number of hours |
|-------------------------|---|-----------------|
| Cl 1 | Domain/concept model. | 2 |
| Cl 2 | Data modeling: definition of a structure of the information model elements. | 4 |
| Cl 3 | Specification of constraints which refer to elements of the information model. Definition of initial values, and derivation algorithms for derived properties (OCL expressions). | 4 |
| Cl 4 | Specification of business logic actions - definition of requirements which refer to a realization of system actions. Definition of constraints referred to UI elements (OCL expressions). | 4 |
| Cl 5 | Test | 1 |
| Total hours | | 15 |

| Form of classes - laboratory | | Number of hours |
|-------------------------------------|---|------------------------|
| Lab 1 | Introduction to the project: conditions of the course, topics of projects. Organization of work, preparation of the modeling tool (project structure definition, import of the profile with standard). Elaboration of application concept (glossary, domain model, business rules). | 4 |
| Lab 2 | Business analysis of problem domains - development of a business processes model of the organization. | 4 |
| Lab 3 | Business requirements specification. Linking requirements with elements of the business analysis model. | 2 |
| Lab 4 | User requirements specification. Trace user requirements from business requirements. | 2 |
| Lab 5 | Data modeling: definition of a structure of the information model elements and life cycle of selected elements of this model | 4 |
| Lab 6 | Specification of use cases scenarios using UML activity diagrams. | 4 |
| Lab 7 | Specification of navigation maps for use cases. | 2 |
| Lab 8 | User interface prototype. Definition of system constraints referred to UI elements. | 4 |
| Lab 9 | Results presentation. Handing the project over for assessment. | 4 |
| | Total hours | 30 |

| TEACHING TOOLS USED |
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| <p>N1. Lecture informative with elements of problem domains, supported by multimedia presentations and examples of solutions</p> <p>N2. Introduction to laboratory that contains the specification of the tasks and detailed comments, useful for the tasks. Examples of documents</p> <p>N3. Case tool used for modeling</p> <p>N4. E-learning system used for the publication of teaching materials and messages</p> |

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

| Evaluation (F – forming (during semester), C – concluding (at semester end)) | Educational effect number | Way of evaluating educational effect achievement |
|---|----------------------------------|---|
| F1 | | |
| C1 | | |

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|---|
| PRIMARY AND SECONDARY LITERATURE |
| <u>PRIMARY LITERATURE:</u> |
| [1] OMG Unified Modeling Language Specification, 2015 |
| [2] OMG Object Constraint Language Specification, 2014 |
| [3] OMG Systems Modeling Language Specification, 2013 |
| [4] J. Beatty, K. Wiegers: <i>Software Requirements (Developer Best Practices)</i> (3rd Edition), 2013 |
| [5] R. Wazlawick: <i>Object-Oriented Analysis and Design for Information Systems</i> , 2014 |
| <u>SECONDARY LITERATURE:</u> |
| [1] Materials prepared by the lecturer |
| SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS) |
| dr inż. Anita Walkowiak, anita.walkowiak@pwr.edu.pl |

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Business and system analysis
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
AND SPECIALIZATION

| Subject educational effect | Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)** | Subject objectives*** | Programme content*** | Teaching tool number*** |
|-----------------------------------|--|------------------------------|-------------------------------------|--------------------------------|
| PEK_W01 | K2INF_W01, K2INF_IO_W01 | C1 | Lec1-Lec5, Lab1-Lab8, C1 C11-C14 | N1, N2 |
| PEK_W02 | K2INF_W01, K2INF_IO_W01, K2INF_IO_W02 | C1 | Lec1-Lec5, Lab1-Lab8, C11-C14 | N1, N2 |
| PEK_W03 | K2INF_IO_W02 | C2 | Lec1-Lec5, Lab1-Lab8 | N1, N2 |
| PEK_U01 | K2INF_U05, K2INF_U06, K2INF_IO_U04, K2INF_IO_U05 | C1, C2, C3, C4 | Lec1-Lec5, Lab1-Lab8, C11-C14 | N1, N2, N3, N4 |
| PEK_U02 | K2INF_IO_W02 | C2 | Lec1-Lec5, Lab1-Lab8, C11-C14 | N1, N2 |
| PEK_U03 | K2INF_IO_U04, K2INF_U05 | C1, C2 | Lec1-Lec5, Lab1-Lab8, | N1, N2 |
| PEK_U04 | K2INF_IO_U04, K2INF_U05 | C1, C2 | Lec1-Lec5, Lab1-Lab8, | N1, N2 |
| PEK_U05 | K2INF_IO_U04 | C1 | Lec1-Lec5, Lab1-Lab8, | N1, N2, N3 |
| PEK_U06 | K2INF_U05 | C3 | Lab1-Lab8 | N3 |
| PEK_W01 | K2INF_W01, K2INF_IO_W01 | C1 | Lec1-Lec5, Lab1-Lab8, C11-C14 | N1, N2 |

** - enter symbols for main-field-of-study/specialization educational effects

*** - from table above