

FACULTY: Informatics and Management					
SUBJECT CARD					
Name in Polish: Modelowanie i analiza systemów informacyjnych					
Name in English Information Systems Modeling and Analysis					
Main field of study (if applicable): Informatics					
Specialization (if applicable): Computer Engineering					
Level and form of studies: 1st/ 2nd* level, full-time / part-time*					
Kind of subject: obligatory / optional / university-wide*					
Subject code INZ0113WC					
Group of courses YES / NO*					
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	30			
Number of hours of total student workload (CNPS)	90	120			
Form of crediting	Examination / crediting with grade*				
For group of courses mark (X) final course	X				
Number of ECTS points	3	4			
including number of ECTS points for practical (P) classes	0	3			
including number of ECTS points for direct teacher-student contact (BK) classes	1,8	2,4			

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Practice in object-oriented programming.
2. Basic knowledge of software engineering.

SUBJECT OBJECTIVES

- C1. Basic knowledge in the area of object-oriented software modeling relating to the modeling and the object-orientation as modern paradigms in software development.
- C2. Modern modeling languages: the Unified Modeling Language, Business Process Modeling Notation, and SysML as standards in modern approaches to information systems modeling.

SUBJECT EDUCATIONAL EFFECTS

Relating to knowledge:

PEK_W01: Students have basic knowledge on the role of modeling in information systems development process, especially, they know and understand the role of business modeling and specification of system requirements.

PEK_W02: Students have knowledge about modern modeling languages.

Relating to skills:

PEK_U01: Students can construct and analyze business models.

PEK_U02: Students can build models of system requirements.

Relating to social competences:

PEK_K01: Students are able to think creatively and act effectively.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Software development cycle. Model-driven and quality-driven software development.	2
Lec 2	Survey of modeling languages: UML, BPMN and SysML.	2
Lec 3	Class diagrams – classes, associations, generalizations.	2
Lec 4	Object diagrams as instances of class diagrams.	2
Lec 5	Object Constraint Language.	2
Lec 6	System requirements; use case diagrams.	2
Lec 7	Sequence diagrams.	2
Lec 8	UML activity diagrams.	2
Lec 9	BPMN activity diagrams.	2
Lec 10	Statechart diagrams.	2
Lec 11	SysML requirements diagrams.	2
Lec 12	System analysis.	2
Lec 13	Architecture design.	2
Lec 14	UML implementation diagrams – component and deployment diagrams.	2
Lec 15	Metamodeling, UML metamodel.	2
	Total hours	30
Form of classes - class		Number of hours
Cl 1	Textual description of exemplary application domains.	2
Cl 2	Construction and analysis of simple class diagrams.	2
Cl 3	Object diagrams as instances of class diagrams.	2
Cl 4	Analysis of advanced elements of class diagrams (association classes, n-ary associations).	2
Cl 5	Case study – an example of structural modeling.	2
Cl 6	Construction and analysis of OCL constraints imposed on class diagrams.	2

CI 7	Intermediate test.	2
CI 8	Construction and analysis of use case diagrams.	2
CI 9	Interpretation of use cases using sequence diagrams.	2
CI 10	Interpretation of use cases using activity diagrams.	2
CI 11	Construction and analysis of simple BPMN diagrams.	2
CI 12	Construction and analysis of advanced BPMN diagrams.	2
CI 12	Construction and analysis of simple state diagrams.	2
CI 13	Construction and analysis of advanced state diagrams.	2
CI 14	SysML requirements diagrams.	2
CI 15	Final test.	2
	Total hours	30

TEACHING TOOLS USED

- N1. Lecturer's presentation at a blackboard, supported by a multimedia presentation using a laptop and a projector.
 N2. Individual search and study of literature and Internet sources.
 N3. Access to teaching materials published in the local area network.
 N4. Individual consultations.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01 PEK_W02 PEK_U01	Each student gets 1 point for own solution of a problem from the list of problems for the given class.
F2	PEK_W01 PEK_W02 PEK_U02	Each student gets up to 10 points for own solution of problems for the given test (intermediate and final).
F3	PEK_W01 PEK_W02 PEK_K01	Each student gets up to 20 points for own solution of problems from the list of problems for the examination test.

C Final evaluation is based on the sum of points received within F1, F2 and F3 evaluations, according to the table:

Points	20	25	30	35	40
Mark	3.0	3.5	4.0	4.5	5.0

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Rumbaugh J., Jacobson I., Booch G., *The Unified Modeling Language – Reference Manual*. Second edition, Addison-Wesley, 2005.
- [2] Weilkiens T., Oestereich B., *UML 2 Certification Guide. Fundamental and Intermediate Exams*, Elsevier 2007.
- [3] Maciaszek L. A., *Requirements Analysis and System Design*, Second edition, Pearson, Addison-Wesley, 2005.
- [4] Adolph S., Bramble P., *Patterns for Effective Use Cases*, Addison-Wesley, 2003
- [5] Gašević D., Djurić D., Devedžić V., *Model Driven Architecture and Ontology Development*, Springer, 2006.

SECONDARY LITERATURE:

- [1] Graessle P., Baumann H., Baumann P., *UML 2.0 w akcji. Przewodnik oparty na projektach*, Helion, 2006.
- [2] Object Management Group, Unified Modeling Language (available on the website: www.omg.com).
- [3] Object Management Group, System Modeling Language SysML (available on the website: www.omg.com).
- [4] Object Management Group, Business Process Modeling Notation BPMN (available on the website: www.omg.com).

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR
 SUBJECT
 Information Systems Modeling and Analysis
 AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
 Informatics
 AND SPECIALIZATION
 Computer Engineering**

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 (knowledge)	S2CE_W02, S2CE_W03	C1, C2	Lec1-Lec15	N1, N2, N3, N4
PEK_W02	S2CE_W02, S2CE_W03	C1, C2	Lec1-Lec15	N1, N2, N3, N4
PEK_U01 (skills)	S2CE_U01, S2CE_U02, S2CE_U06	C1, C2	C11-C115	N1, N2, N3, N4
PEK_U02	S2CE_U01, S2CE_U02, S2CE_U06	C1, C2	C11-C115	N1, N2, N3, N4
PEK_K01 (competences)	S2XXX_K01	C1, C2	Lec1-Lec15 C11-C115	N1, N2, N3, N4

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

*** - from table above